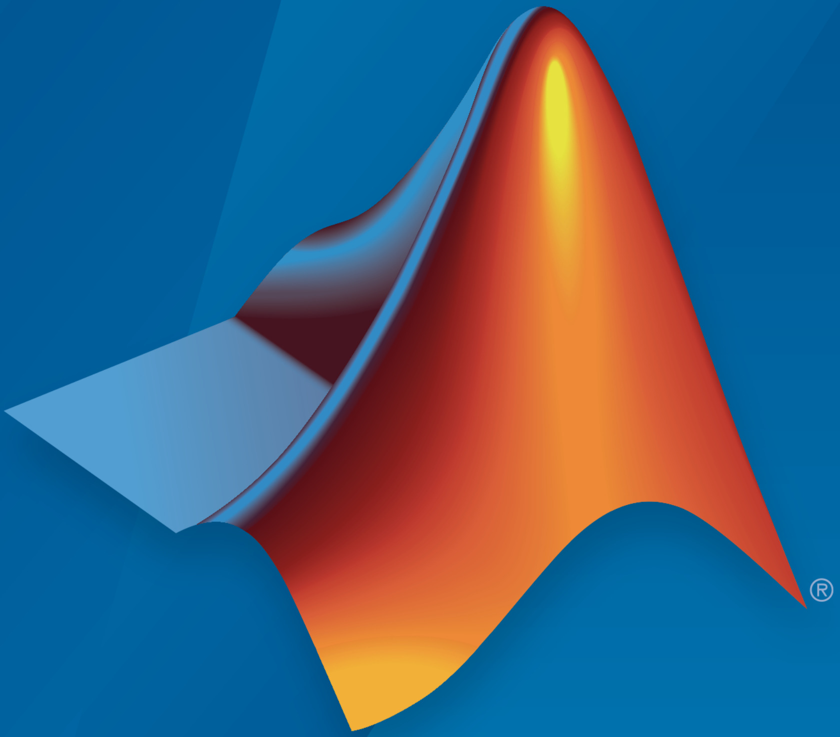
Simulink® Report Generator™

User's Guide



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Simulink® Report Generator™ User's Guide

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2 Generate System Design Description Reports

3 Creating Simulink Reports

4 Generate a Report

Getting Started

Simulink Report Generator Product Description

Design and generate reports from models and simulations

Simulink Report Generator lets you design and generate richly formatted Microsoft® Word, Microsoft PowerPoint, HTML, and PDF reports from Simulink models and simulations. The report generator lets you automatically create artifacts for Model-Based Design, such as system design descriptions, generated code, requirements traceability, and testing reports. It can produce artifacts for DO-178, ISO 26262, IEC 61508, and related industry standards. An interactive rendition of your model can be generated for viewing in a web browser.

Using the Simulink Report Generator you can compare models, review comparison results in an interactive XML report, merge model differences, and create difference reports.

Key Features

- Automatic capture of simulation results and model specifications
- Report formatting based on Microsoft Word and HTML report templates
- Interactive reports for viewing models, generated code, and analysis results in web browsers
- Report designer app for creating custom Word, HTML, PDF, RTF, and XML reports
- Artifacts for DO-178, IEC 61508, and ISO 26262, including system design, model and code verification, and requirements documentation
- API for forms-based Word, PowerPoint, HTML, and PDF report generation
- Model differencing and merging (two-way and three-way) with XML comparison tool

System Design Documentation and Results Reporting

In this section...

Types of Reports

Two common goals for creating reports are:

- System design documentation — Capture information about the design decisions, structure, implementation, and operational details of a system.
- Results reporting — Present results of running a system.

You use a similar workflow for creating and generating reports for both goals. However, some components are particularly useful for each use case.

System Design Documentation

System documentation helps you to:

- Capture design decisions
- Record implementation details
- Communicate the system design and interfaces among groups

When you create a Simulink Report Generator report to provide system design documentation, the report captures information about the system design from the model. Each time that you generate the report, you see up-to-date documentation for the design.

The table includes examples of components that are useful for system design documentation reports.

System Information	Examples of Components to Use
Requirements	`Requirements Summary Table` (for requirements specified with Simulink Verification and Validation™)
System layout	`System Hierarchy`, `System Snapshot`

System Information	Examples of Components to Use
Model configuration	`Model Configuration Set`, `Model Advisor Report`
Block parameter settings	`Simulink Dialog Snapshot`, `Block Loop`
Properties	`Simulink Property Table`, `Simulink Summary Table`
Variables	`Variable Table`, `Simulink Workspace Variable`
System documentation included in a model	`Documentation`, `Simulink Name`

Results Reporting

Capturing results from simulating a model is useful for:

- Model regression testing
- Verifying and validating designs
- Exploring design alternatives
- Optimizing designs

The table includes examples of components that are useful in results reports.

Results Information	Examples of Components to Use
Signal values	`Scope Snapshot`, `Block Loop`
Simulation processing	`Model Simulation`, `Model Configuration Set`, `Fixed-Point Logging Options`
Figures generated with MATLAB®	`Figure Snapshot`, `To Workspace Plot`
Generated code	`Code Generation Summary`, `Import Generated Code`

You can use components such as the `Model Simulation` component to control how the model simulates. Other components, such as the `Scope Snapshot`, show the results of the simulation.

Generate Reports Without Customizing

In this section...
"Predefined Standard Reports" on page 1-5
"Web View" on page 1-5
"XML Comparison Report" on page 1-6

You can use Simulink Report Generator without customizing reports by using:

- Predefined standard reports
- Web view
- XML Comparison report

Predefined Standard Reports

Simulink Report Generator comes with two predefined, standard reports for Simulink:

- System Design Description
- Design Requirements (requires Simulink Verification and Validation)

You generate these reports using the **File** > **Reports** menu in the Simulink Editor. The System Design Description report provides summary or detailed information about a system design represented by a model. You can choose report options by using the report dialog box, or you can create a customized version using the Report Explorer. You can use the System Design Description report setup file as a starting point for creating a setup file for your own report. For details, see "Generate a System Design Description Report" on page 2-6.

The Design Requirements report includes information about all the requirements associated with the model and its objects. You must have the Simulink Verification and Validation product installed to use the Design Requirements report. For details, see "Customize Requirements Traceability Report for Model" in the Simulink Verification and Validation documentation.

Web View

A Web view is a view of a model that you can explore in a Web browser. Web views are useful for presenting models to audiences and for sharing models with colleagues who do not have MathWorks® products installed. You can use Web views to navigate subsystems and see properties of blocks and signals. For details, see “Export Models to Web View Files” on page 5-4.

XML Comparison Report

You can use Simulink Report Generator software to compare XML text files of different versions of a Simulink model to explore differences between versions. You can also compare the XML text files of two different models. For details, see “Model Comparison”.

Approaches to Creating Reports

You can create and generate reports:

- Interactively, using the Report Explorer
- Programmatically, using the DOM (Document Object Model) API
- Programmatically using the PPT (Microsoft PowerPoint®) API

You can use the Report Explorer interface to create reports without having to write code.

Using the programmatic approach, you can integrate report generation into analysis and testing applications. For more information, see “Programmatic Report Creation”.

You can use the PPT (PowerPoint®) API to add generated content to an existing PowerPoint presentation or to create a complete PowerPoint presentation programmatically. Your presentation can capture dynamic information from a MATLAB® program without your making manual updates to the presentation. You can use templates, slide masters, and styles to format your presentation. For more information, see “Programmatic PowerPoint Presentation Creation”.

Interactive Report Creation Workflow

Use this general approach for creating reports interactively.

1. Open the Report Explorer. In the Simulink Editor, select **Tools** > **Report Generator**.
2. Create a report setup file for your new report design.
3. Add components to the report setup file. Components determine the behavior and contents of your report. You can use the supplied components and you can create your own custom components.
4. Choose a Microsoft Word, HTML, or PDF template or a Report Explorer stylesheet to associate styles with the report setup file.
5. Generate the report.

Related Examples

- “Generate a Report Using a Template”
- “Working with Components”

More About

- “Report Setup”
- “Layout Stylesheets”

Report Components

In this section...
“About Report Components” on page 1-9
“Report Structure Components” on page 1-10
“System-Based Components” on page 1-10
“User-Supplied Information Components” on page 1-12
“Dynamic Reporting Components” on page 1-12
“Format Control at the Component Level” on page 1-13

About Report Components

Include components in a report setup file to specify report behavior and insert content, such as tables, lists, and figures, into a report. Use the Report Explorer to add components to a report and to specify their behavior.

Use a combination of these types of components in your report setup file.

Component Type	Description
“Report Structure Components” on page 1-10	Include a title page, sections, and other components to organize the content of a report.
“System-Based Components” on page 1-10	Include components that obtain information directly from a model to include in a report.
“User-Supplied Information Components” on page 1-12	Include text and graphics that you supply, independent of a model.
“Dynamic Reporting Components” on page 1-12	Set up dynamic control for when to include components and what information to report on for a component, based on data from a model or on other conditions that you specify.

Report Structure Components

To add a title page, use a `Title Page` component. You can include an abstract and legal notice information. For an example, see “Add a Title Page” on page 3-12.

To organize a report into sections, use `Chapter/Subsection` components. For an example, see “Create a Section for Each Iteration” on page 3-29.

System-Based Components

The Simulink Report Generator includes components that get information from a model to include in a report. Using system-based components allows your report to describe the current state of a model. Once the setup file contains these components, you can generate the report whenever you want to capture the latest version of a model.

Property table components display property name/property value pairs for objects in tables. Summary table components insert tables that include specified properties for objects into generated reports. The tables contain one object per row, with each object property appearing in a column, as shown in the following summary table.

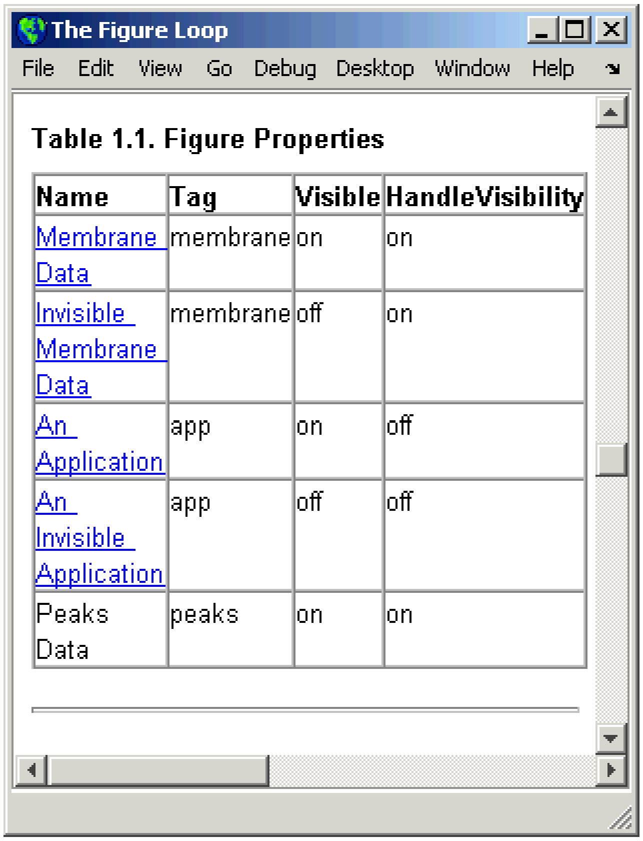


Table 1.1. Figure Properties

Name	Tag	Visible	HandleVisibility
Membrane Data	membrane	on	on
Invisible Membrane Data	membrane	off	on
An Application	app	on	off
An Invisible Application	app	off	off
Peaks Data	peaks	on	on

To use descriptive information from DocBlock blocks, use the `Documentation` component.

A few examples of system-based components include:

- `MATLAB Property Table`
- `Simulink Workspace Variable`
- `System Hierarchy`
- `Simulink Summary Table`
- `Simulink Dialog Snapshot`
- `Block Execution Order List`
- `Model Loop`

- `Model Configuration Set`
- `Scope Snapshot`

For examples of using system-based components, see:

- “Property Table Components” on page 6-6
- “Summary Table Components” on page 6-17
- “Create the Body of the Report” on page 3-21

The Simulink Report Generator also includes system-based components that contain model elements from the following Simulink products:

- Stateflow®
- Fixed-Point Designer™
- Simulink Coder™
- Simulink Verification and Validation

User-Supplied Information Components

In addition to using system-based components to extract data from a system and insert that information into a report, you can also add content that you, or others, supply. For example, to include text, use the `Paragraph` and `Text` components.

To insert a graphic from a file, use an `Image` component. To insert ASCII text, use an `Import File` component.

To include notes about the report source files, use a `Comment` component.

For an example, see “Add Introductory Text to the First Chapter”.

Dynamic Reporting Components

Dynamic reporting components execute conditionally, enabling you to decide when a child component executes or how many times a child component executes. To control the report generation flow, use logical and flow components such as `Logical If`, `Logical Then`, `While Loop`, or `For Loop`.

A looping component runs its child components a specified number of times. There are several looping components, including logical loops, Handle Graphics® loops, and model and chart loops. For model and chart loops, you can control aspects such as the order in which the report sorts blocks.

For examples, see:

- "Logical and Looping Components" on page 6-21
- "Add Logical Then and Logical Else Components" on page 3-16
- "Create the Body of the Report" on page 3-21
- "Filter with Loop Context Functions" on page 6-22

Format Control at the Component Level

The output format and stylesheet that you select for a report determines most aspects of the generated report formatting. For details, see "Report Output Format" on page 4-4.

In addition to stylesheets that control the format and layout of the report, for some components you can set properties to specify formatting details for that specific instance of a component. For example, for the `Simulink Property Table`, you can specify whether to display table borders or specify the alignment of text in table cells.

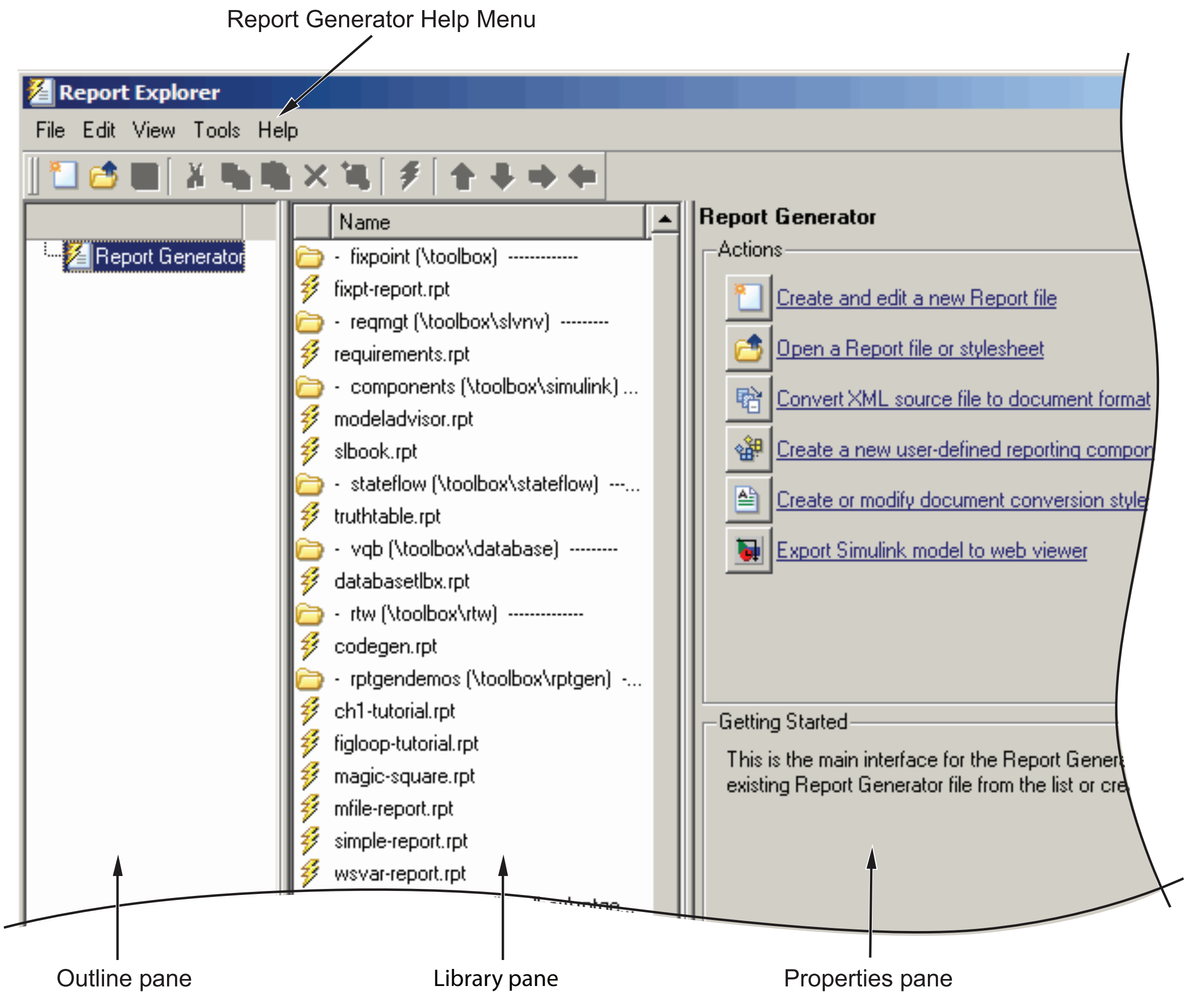
Working with the Report Explorer

About the Report Explorer

The *Report Explorer* is the MATLAB Report Generator and Simulink Report Generator graphical interface. It allows you to:

- Create and modify report setup files.
- Apply stylesheets to format the generated report.
- Specify the report file format.
- Generate reports.

To open the Report Explorer, enter `report` in the MATLAB Command Window.



Report Generator

Actions

Create and edit a new Report file

Open a Report file or stylesheet

Convert XML source file to document format

Create a new user-defined reporting compon

Create or modify document conversion style

Export Simulink model to web viewer

Getting Started

This is the main interface for the Report Gener
existing Report Generator file from the list or cre

```
- fixpoint (\toolbox) ------------
fixpt-report.rpt
- reqmgt (\toolbox\slvnv) --------
requirements.rpt
- components (\toolbox\simulink) ...
modeladvisor.rpt
slbook.rpt
- stateflow (\toolbox\stateflow) ---...
truthtable.rpt
- vqb (\toolbox\database) --------
databasetlbx.rpt
- rtw (\toolbox\rtw) -------------
codegen.rpt
- rptgendemos (\toolbox\rptgen) -...
ch1-tutorial.rpt
figloop-tutorial.rpt
magic-square.rpt
mfile-report.rpt
simple-report.rpt
wsvar-report.rpt
```

The Report Explorer has three panes:

- The *Outline pane* on the left shows the hierarchy of components in currently opened report setup files. Report components can reside within other report components, creating parent, child, and sibling relationships.
- The *Library pane* in the middle lists the objects available in the context of the Outline pane.

Outline Pane Context	Library Pane Contents
No report setup file is open.	Reports
Report setup file is open.	Components
Stylesheet is open.	Stylesheet attributes

- The *Properties pane* contents depend on the Outline pane context. If no report setup file is open, on the right displays tasks the Report Explorer can perform. If a report setup file is open, the Properties pane displays the properties for the item that is currently selected in the Library pane.

Outline Pane Context	Properties Pane Contents
No report setup file is open.	Tasks that the Report Explorer can perform
Report setup file is open.	Properties for the item that is currently selected After you create a report setup file, the Properties pane initially displays properties for the report setup file as a whole.

Tip If the Report Explorer window opens with only two panes, one of the panes is hidden. You can move the vertical boundaries between the panes to reveal any hidden pane, or to make visible panes wider or narrower.

Generate System Design Description Reports

System Design Description

In this section...

Predefined Standard Reports

From the Simulink Editor, you can access two predefined, standard Simulink Report Generator reports called:

- System Design Description
- System Requirements Traceability

The System Design Description report provides summary or detailed information about a system design represented by a model. You can choose report options using the report dialog, or you can create a customized version using the Report Explorer. For details, see "Generate a System Design Description Report" on page 2-6.

You can use the System Design Description report setup file as a starting point for creating a setup file for your own report.

You can also generate an HTML model report for Stateflow charts. For details, see "Generate a Model Report".

The System Requirements Traceability report requires that you have the Simulink Verification and Validation product installed. The System Requirements Traceability report includes information about all the requirements associated with the model and its objects. For details, see "Customize Requirements Traceability Report for Model" in the Simulink Verification and Validation documentation.

What Is the System Design Description?

The System Design Description is a prebuilt Simulink Report Generator report that describes the system design represented by a Simulink model.

By default, the Simulink Report Generator generates the report for the model from which you invoke the System Design Description report option.

What You Can Do with the Report

You can use the System Design Description to

- Review a system design without having the model open
- Generate summary and detailed descriptions of the design
- Assess compliance with design requirements
- Archive the system design in a format independent of the modeling environment
- Build a customized version of the report, using the Report Explorer

---

Note: To view step-by-step tutorials for creating and generating a report, see the Introduction to System Design Description Reports example.

Report Contents

You can specify what kinds of information to include in the report, in terms of:

- What elements of a model to include in the report (for example, whether to include subsystems from custom libraries)
- Whether to generate a summary version or a detailed version of the System Design Description report.

For details, see "Generate a System Design Description Report" on page 2-6.

Summary Version

Section	Information
Report Overview	Model version
Root System	• Block diagram representing the algorithms that compute root system outputs • Description (if available from model) • Interface: name, data type, and other properties of the system input and output signals

Section	Information
	• Subsystems: the path and a block diagram for each subsystem • State charts • Requirements (optional)
Subsystems	• Path • Block diagram
System Design Variables	• Design variables • Functions in design variable expressions

Detailed Version

The detailed version of the report includes all the information that is in the summary form of the report, as well as more information about the system components. The atomic subsystem information is more detailed than virtual subsystem information.

Section	Information
Report Overview	Model version
Root system	• Block diagram representing the algorithms that compute root system outputs • Description (if available from model) • Interface: name, data type, and other properties of the root system input and output signals • Block parameters • Includes detailed information about MATLAB Function blocks • Block execution order for root system and atomic subsystems • Look-up tables • Simulink workspace variables • Model configuration sets • State charts • Requirements (optional)

Section	Information
Subsystems	The same type of information as the information for the root system, as well as: • Path of the subsystem in the model • (For atomic subsystems) Checksum that indicates whether the version of an atomic subsystem that generates the report differs from other versions of the subsystem • Referenced models (optional) • Subsystems from custom libraries (optional)
State Charts	• State chart • States • Transitions between the states • Junctions • Events that trigger state transitions • Data types • Targets • Truth tables

Report Captures Documentation Included in a Model

The System Design Description reports documentation included in a model, including:

- The model description (from the model properties)
- The block property `Description`
- DocBlock model documentation blocks

To enrich the generated System Design Description, add corresponding information in the model.

Generate a System Design Description Report

Generate a system design description report to create a standard report of your model from the Simulink Editor. The System Design Description report provides summary or detailed information about a system design represented by a model.

When you generate the report, you can specify layout and content options for:

- Title page contents
- Report content
- Report file format and storage location

Tip For faster report generation, set **File format** to one of the `from template` options. For example, select `Direct PDF (from template)` to output to PDF.

---

1. Open the model or subsystem for which you want to generate a report. The model must compile without error for the report to generate.
2. From the **File** menu, select **Reports** > **System Design Description**.
3. In the System Design Description dialog box, specify layout and content options for the report. To display detailed information about each option, right-click the label and select **What's This**.
4. Click **Generate**.

To create a customized version of the report, click **Customize Content**. This option creates a copy of the report setup file and opens the copy in the Report Explorer. See “Customize the System Design Description” on page 2-7.

More About

- “System Design Description” on page 2-2

Customize the System Design Description

In this section...

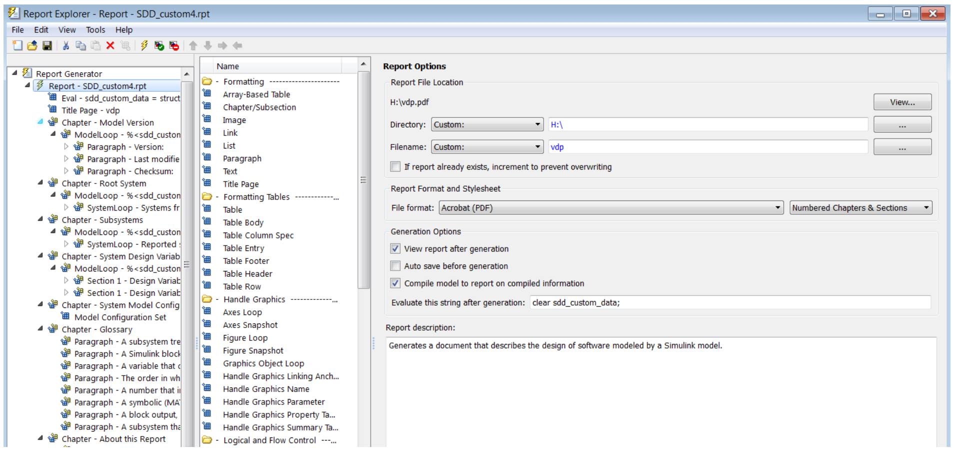
You can create customized versions of the System Design Description report by using the Report Explorer and, optionally the MATLAB tools for building graphical user interfaces.

By default, when you open a customized version of the report, the System Design Description dialog box does not open.

Using the Report Explorer to Customize the Report

To customize the System Design Description setup file in the Simulink Report Generator using the Report Explorer:

1 In the System Design Description dialog box, click the **Customize Content** button to open the Report Explorer.



Report Generator
Report - SDD_custom4.rpt
Eval - sdd_custom_data = struct
Title Page - vdp
Chapter - Model Version
ModelLoop - %<sdd_custon
Paragraph - Version:
Paragraph - Last modifie
Paragraph - Checksum:
Chapter - Root System
ModelLoop - %<sdd_custon
SystemLoop - Systems fr
Chapter - Subsystems
ModelLoop - %<sdd_custon
SystemLoop - Reported :
Chapter - System Design Variab
ModelLoop - %<sdd_custon
Section 1 - Design Variab
Section 1 - Design Variab
Chapter - System Model Config
Model Configuration Set
Chapter - Glossary
Paragraph - A subsystem tre
Paragraph - A Simulink block
Paragraph - A variable that c
Paragraph - The order in wh
Paragraph - A number that i
Paragraph - A symbolic (MA
Paragraph - A block output,
Paragraph - A subsystem tha
Chapter - About this Report

- Formatting ---------------------
Array-Based Table
Chapter/Subsection
Image
Link
List
Paragraph
Text
Title Page
- Formatting Tables ------------...
Table
Table Body
Table Column Spec
Table Entry
Table Footer
Table Header
Table Row
- Handle Graphics -------------...
Axes Loop
Axes Snapshot
Figure Loop
Figure Snapshot
Graphics Object Loop
Handle Graphics Linking Anch...
Handle Graphics Name
Handle Graphics Parameter
Handle Graphics Property Ta...
Handle Graphics Summary Ta...
- Logical and Flow Control ---...

Report Options

Report File Location

H:\vdp.pdf

Directory: Custom: H:\

Filename: Custom: vdp

☐ If report already exists, increment to prevent overwriting

Report Format and Stylesheet

File format: Acrobat (PDF) Numbered Chapters & Sections

Generation Options

☑ View report after generation

☐ Auto save before generation

☑ Compile model to report on compiled information

Evaluate this string after generation: clear sdd_custom_data;

Report description:

Generates a document that describes the design of software modeled by a Simulink model.

The Report Explorer reflects any changes (for example, a different report name) that you made in the System Design Description dialog box.

2 In the Report Explorer, add or modify components. See "Working with Components" and "Information Components".

- Do not remove the `sdd_custom_data` structure, which is defined as:

  ```
  sdd_custom_data = struct('model',bdroot,'rootSystem',gcs);
  ```

  You can modify the `model` argument, which is the model for which you generated the report and the `rootSystem` argument, which is the system level in the model at which, and below which, you want to use to generate the report.
- Do not remove or modify functions that begin with `StdRpt`, such as `%StdRpt.getChecksum`

3 Optionally modify a style sheet (see “Layout Stylesheets”).

4 Save the customized report with a name other than `SDD_custom.rpt`.

Building a Dialog Box for a Custom Report Setup File

To provide options for your custom report, you can create a dialog box, like the System Design Description dialog box. The dialog box that you create for your custom report can allow others to adapt the report to meet their needs, without their having to use the Report Explorer.

Creating Simulink Reports

Create a Simulink Report Generator Report

This example shows how to use the Report Explorer to design a report setup file and generate a report that does the following:

- Opens a Simulink model for the van der Pol equation, called the `vdp model`.
- Sets the `Gain` parameter for the `Mu` block to five different values.
- Simulates the model each time the `Gain` parameter is set.
- Collects the results. Results that fall within a specified range appear in a table in the generated report.

You do not need to know MATLAB or Simulink software to create and run this example report. However, knowledge of these products might be helpful for understanding the MATLAB code and model simulation that executes.

To create this report, you perform these main tasks:

- "Specify Report Options in the Setup File" on page 3-3
- "Add Report Content with Components" on page 3-5

This example includes separate sections for different kinds of report creation and generation task. Each section builds on the previous sections. However, if you want to see the report setup components for a later section without doing the previous sections, in MATLAB you can view the completed report setup file by opening `Dynamic Simulink Report`. The report is for the `vdp` model.

Note: For another set of step-by-step examples for creating and generating a report, see the Introduction to System Design Description Reports example.

Specify Report Options in the Setup File

To create and configure the report setup file:

1. Start a Simulink software session.
2. Open the Report Explorer. From the MATLAB Toolstrip, in the **Apps** tab, in the **Database Connectivity and Reporting** section, click **Report Generator**.
3. Select **File** > **New** to create a report setup file.
4. Save the report setup file.

   In the Properties pane:

   a. Specify where to save the report setup file. To save it in the current working folder, select `Present Working Directory` from the **Directory** selection list.
   b. Specify the report format. In the **File format** selection list, select `Acrobat (PDF)`.
   c. Enter a description for the report. In the **Report description** text box, replace the existing contents with the following text.

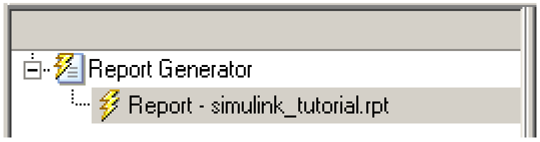
   Tip Copy and paste this code from the HTML documentation into the Report Explorer.

   ```
   Simulink Dynamic Report

   This report opens up a model, sets a block parameter
   several times, simulates the model, and collects the
   results. Results that fall within a specified range are
   displayed in a table after the test is complete.

   The report is configured to test the vdp model only.
   By selecting the Eval String component immediately
   below the Report component, you can modify
   * model
   * block
   * parameter
   * tested values
   ```
5. Click **File** > **Save As** to save the report setup file as `simulink_tutorial.rpt`.

The Outline pane on the left displays the new file name.



To create the content for the report, see "Add Report Content with Components" on page 3-5.

Add Report Content with Components

In this section...

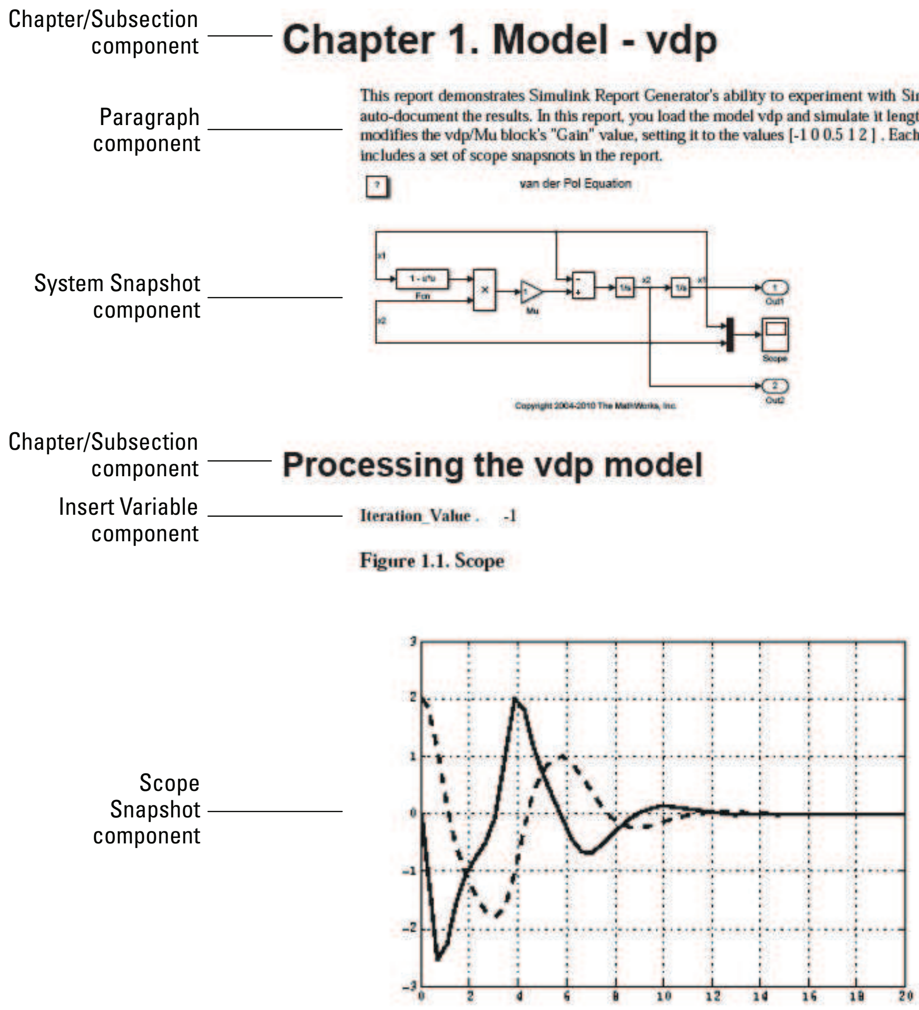
Report Components

Report *components* specify what information to include in the report. Components are self-contained, modular MATLAB objects that control the report-generation process and insert elements, such as tables, lists, and figures, into a report setup file. Use components to customize the appearance and output of reports.

For more information, see "Report Components" on page 1-9.

The following figure shows a sample page from the report you create in this example, and which components you use to produce this output.

Note: Do not deactivate report components that you add to the report setup file.


Chapter/Subsection component
Paragraph component
System Snapshot component
Chapter/Subsection component
Insert Variable component
Scope Snapshot component
van der Pol Equation
1 - u*u
Fcn
Mu
1/s
x1
x2
Out1
Scope
Out2
Copyright 2004-2010 The MathWorks, Inc.

Chapter 1. Model - vdp

This report demonstrates Simulink Report Generator's ability to experiment with Simulink systems and auto-document the results. In this report, you load the model vdp and simulate it length times. This report modifies the vdp/Mu block's "Gain" value, setting it to the values [-1 0 0.5 1 2] . Each iteration of the test includes a set of scope snapsnots in the report.

Processing the vdp model

Iteration_Value . -1

Figure 1.1. Scope

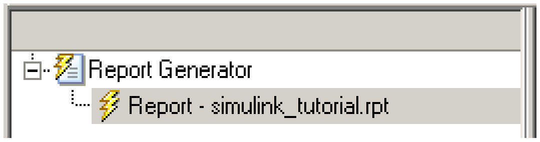
Add MATLAB Code

Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

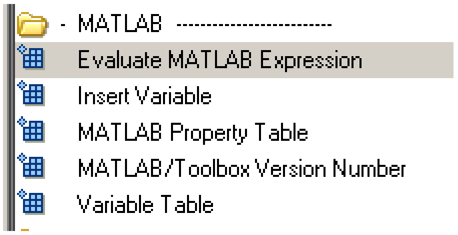
To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

The first component to add is the `Evaluate MATLAB Expression` component, which evaluates MATLAB commands in the workspace. The code in this component assigns initial values to variables used in this example.

1 In the Outline pane on the left, select `simulink_tutorial.rpt`.



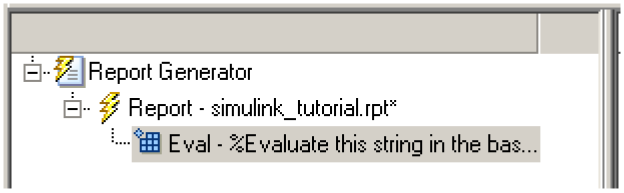
2 In the Library pane in the middle, under the `MATLAB` category, select `Evaluate MATLAB Expression`.



3 In the Properties pane on the right, click the icon next to **Add component to current report** to insert the component into the report.

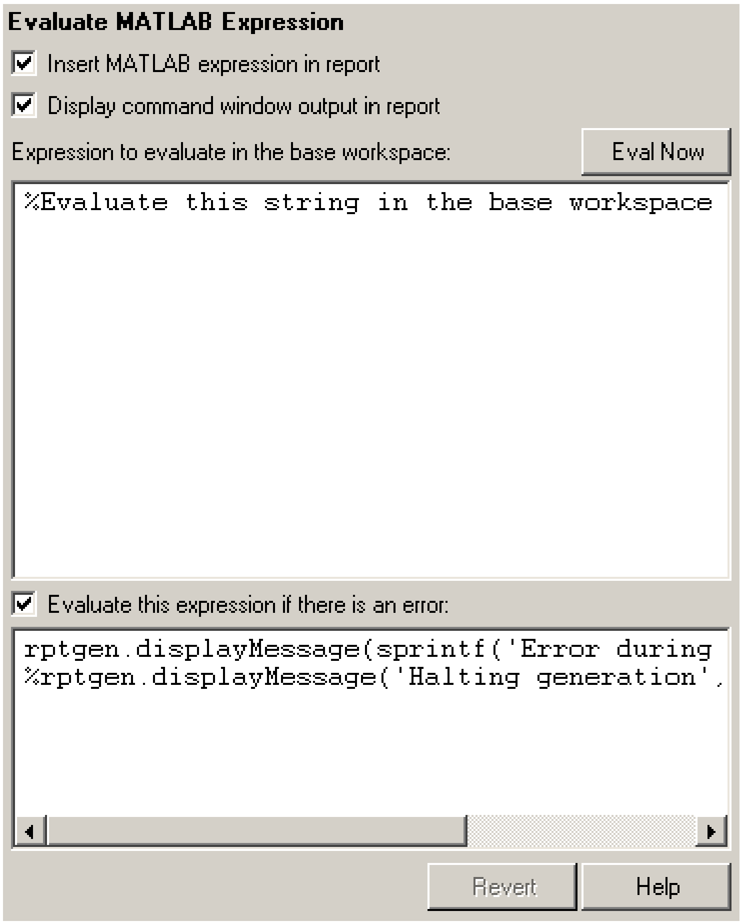
Note: You cannot edit the component information in the Properties pane on the right until you add the component to the report.

In the Outline pane on the left, the `Evaluate MATLAB Expression` component appears under the `simulink_tutorial` report setup file. The Simulink Report Generator software abbreviates the component name to `Eval`.


Report Generator
Report - simulink_tutorial.rpt*
Eval - %Evaluate this string in the bas...

The icon in the upper-left corner of the `Eval` component's icon indicates that this component cannot have child components. By default, any components you add while the `Eval` component is selected are siblings of this component.

The options for the `Evaluate MATLAB Expression` component appear in the Properties pane on the right.


Evaluate MATLAB Expression

- [✓] Insert MATLAB expression in report
- [✓] Display command window output in report

Expression to evaluate in the base workspace:

```
%Evaluate this string in the base workspace
```

- [✓] Evaluate this expression if there is an error:

```
rptgen.displayMessage(sprintf('Error during
%rptgen.displayMessage('Halting generation',
```

4 Clear the **Insert MATLAB expression in report** and the **Display command window output in report** check boxes so you do not include MATLAB code or output in this report.

5 Add MATLAB code to the **Expression to evaluate in the base workspace** text box to specify the following values:

- The model name
- The block name
- The block parameter

- Parameter values
- Other initial values required for processing the vdp model

Replace the existing text with the following MATLAB code.

```
%The name of the model
%that will be changed
expModel='vdp';

%The name of the block in the model
%that will be changed
expBlock='vdp/Mu';

%The name of the block parameter
%that will be changed
expParam='Gain';

%The values that will be set
%during experimentation
expValue=[-1 0 .5 1 2];

%expValue can be either a vector
%or a cell array

testMin=2.1;
testMax=3;

%---- do not change code below line ---

try
   open_system(expModel);
end

expOkValues=cell(0,2);
```

Note: When you change a field in the Properties pane on the right, the field background changes color (the default is a cream color), indicating that there are unapplied changes to that field. As soon as you perform operations on another component, the Simulink Report Generator software applies the changes, and the background color becomes white again.

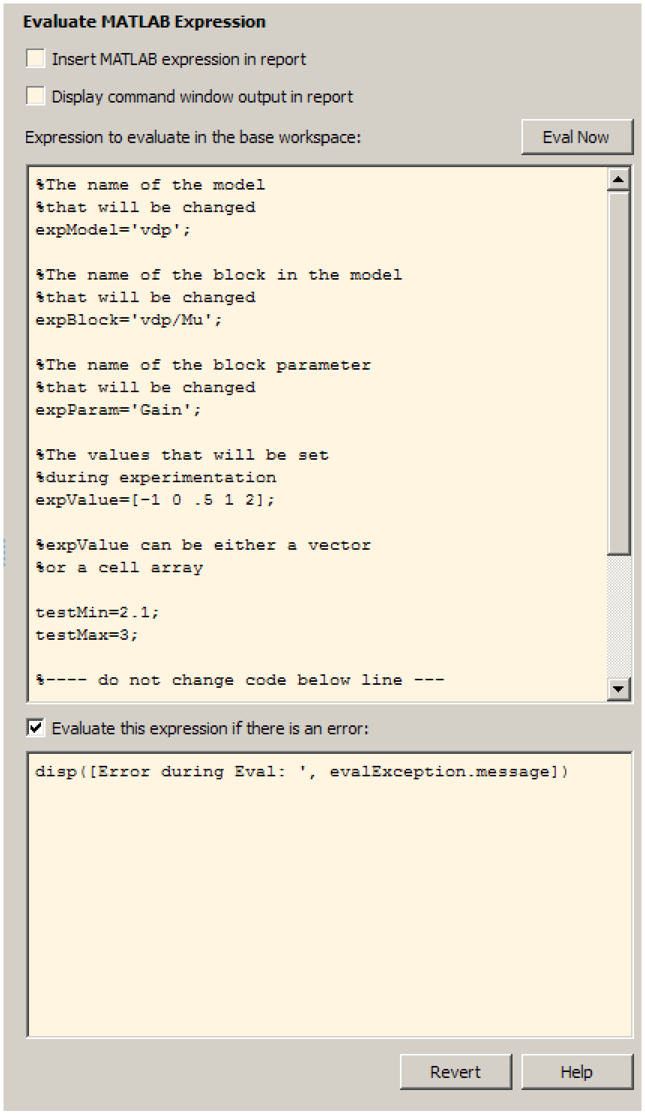
---

6 Select the **Evaluate this expression if there is an error** check box.

7 In the field under the check box, replace the existing text with the following text:

```
disp(['Error during eval: ', evalException.message])
```

The Report Explorer window now looks as follows.



Evaluate MATLAB Expression
Insert MATLAB expression in report
Display command window output in report
Expression to evaluate in the base workspace:
Eval Now
Evaluate this expression if there is an error:
Revert
Help

```
%The name of the model
%that will be changed
expModel='vdp';

%The name of the block in the model
%that will be changed
expBlock='vdp/Mu';

%The name of the block parameter
%that will be changed
expParam='Gain';

%The values that will be set
%during experimentation
expValue=[-1 0 .5 1 2];

%expValue can be either a vector
%or a cell array

testMin=2.1;
testMax=3;

%---- do not change code below line ---
```

```
disp([Error during Eval: ', evalException.message])
```

Tip To run the commands that you specified in your MATLAB expression, click the **Eval Now** button. This button is located at the upper-right corner of the Report Explorer. This is an easy way to ensure that your commands are correct and will not cause report generation problems.

8 Click **File** > **Save** to save the report setup file.

For information about handling error conditions, see "Error Handling for MATLAB Code" on page 3-51.

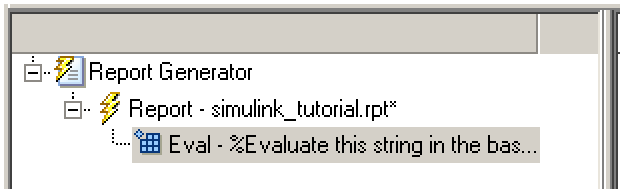
Add a Title Page

Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

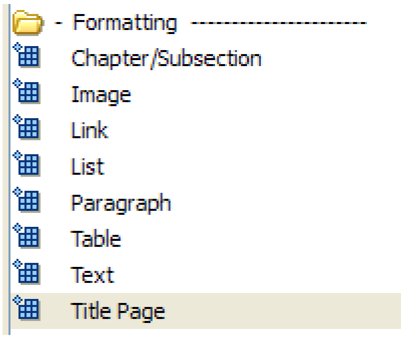
To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

Create a custom title page for your report using the `Title Page` component.

1 In the Outline pane on the left, select the `Eval` component.

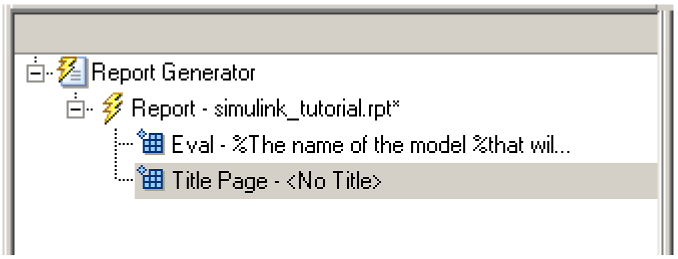

Report Generator
Report - simulink_tutorial.rpt*
Eval - %Evaluate this string in the bas...

2 In the Library pane in the middle, under the `Formatting` category, click `Title Page`.



3 Click the icon next to **Add component to current report**.

The `Title Page` component appears in the Outline pane.


Report Generator
Report - simulink_tutorial.rpt*
Eval - %The name of the model %that wil...
Title Page - <No Title>

Note: To use the Title Page component, you need to have a Chapter component in your report . You have not yet added a Chapter component, so the Properties pane displays a message indicating that chapters are required for the Title Page component to appear correctly. Because later in this example you add Chapter components to this report, you can ignore that message.

4 In the Properties pane on the right:

a In the **Title** text box, enter:

```
Dynamic Simulink Report
```

b In the **Subtitle** text box, enter:

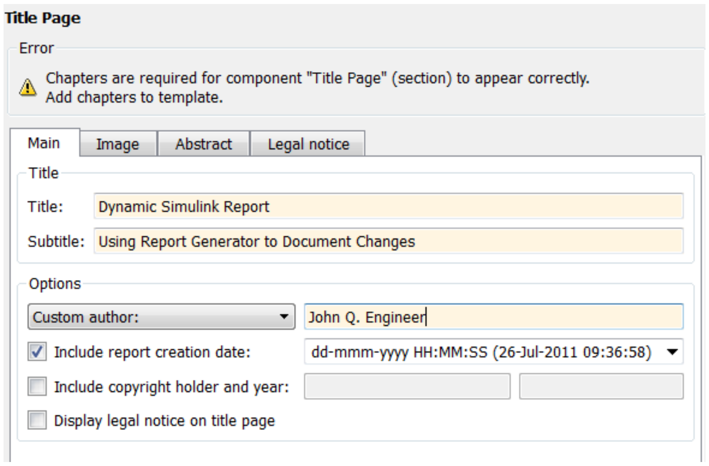
```
Using Simulink Report Generator to Document Changes
```

c In the **Options** section, choose `Custom Author` from the selection list.

d Enter your name in the text box.

e Select the **Include report creation date** check box.

f Select the default date and time format from the selection list. The Properties pane on the right looks as follows.



Title Page

Error

⚠ Chapters are required for component "Title Page" (section) to appear correctly.
Add chapters to template.

Title

Title: Dynamic Simulink Report

Subtitle: Using Report Generator to Document Changes

Options

Custom author: John Q. Engineer

[✓] Include report creation date: dd-mmm-yyyy HH:MM:SS (26-Jul-2011 09:36:58)

[ ] Include copyright holder and year:

[ ] Display legal notice on title page

5 Save the report setup file.

Open the Simulink Model

Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

The following statement in the `Evaluate MATLAB Expression` component that you created in "Add MATLAB Code" on page 3-7 tries to open the vdp model:

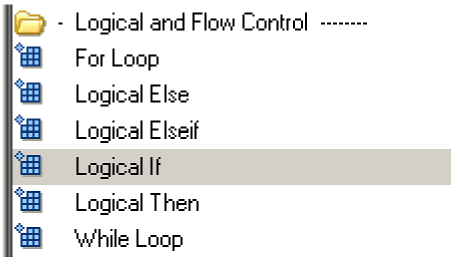
```
try
   open_system(expModel);
end
```

Tip Select the `Eval` component in the Outline pane on the left to look at this code again.

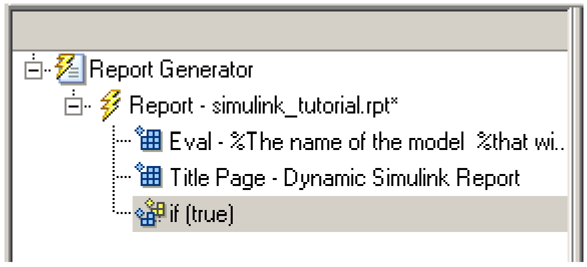
To see if the `vdp` model was successfully opened, test the result of the `open_system` command using a `Logical If` component.

1 In the Outline pane on the left, select the `Title Page` component.

2 In the Library pane in the middle, under the `Logical and Flow Control` category, select `Logical If`. This component checks to see if a given condition is true or false; in this case, if the model opened successfully.



3 In the Properties pane on the right, click the icon next to **Add component to current report**. The `Logical If` component appears as `if` in the Outline pane.


Report Generator
Report - simulink_tutorial.rpt*
Eval - %The name of the model %that wi..
Title Page - Dynamic Simulink Report
if (true)

These components are child components of the report and siblings of one another. Components can have parent, child, and sibling relationships.

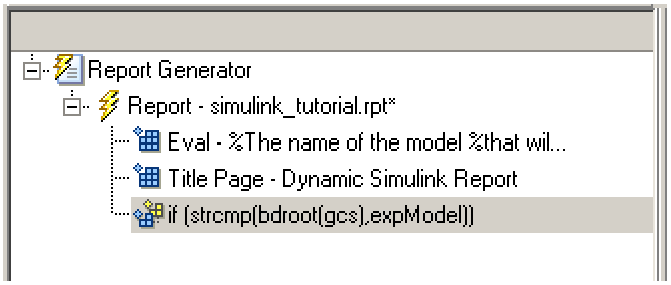
This component can have child components. "Add Logical Then and Logical Else Components" on page 3-16 explains how to add two child components to the `if` component.

4 In the Properties pane on the right, in the **Test expression** text box, replace the default text, `true`, with the following text:

`strcmp(bdroot(gcs),expModel)`
The `strcmp` function compares the name of the open Simulink model and the value of `expModel`, which was set to `'vdp'`. It tests to see if the vdp model opened successfully. `strcmp` returns `1` (`true`) if the two strings match, and `0` (`false`) if not.

5 Save the report setup file.

The `if` component name in the Outline pane changes to include the expression that you added.


Report Generator
Report - simulink_tutorial.rpt*
Eval - %The name of the model %that wil...
Title Page - Dynamic Simulink Report
if (strcmp(bdroot(gcs),expModel))

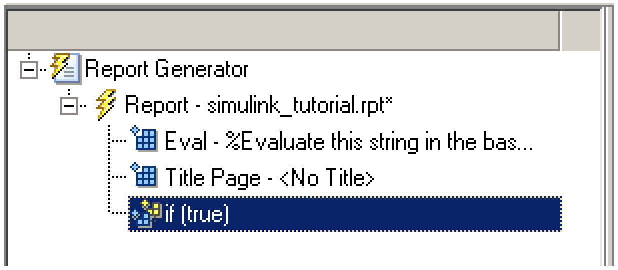
Add Logical Then and Logical Else Components

Note: This section builds on the previous tasks described in the step-by-step example summarized in “Create a Simulink Report Generator Report” on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

The `if strcmp(bdroot(gcs), expModel))` component has two possible results. Add two child components to the report setup file to process these cases.

1 In the Outline pane on the left, select the `if` component.



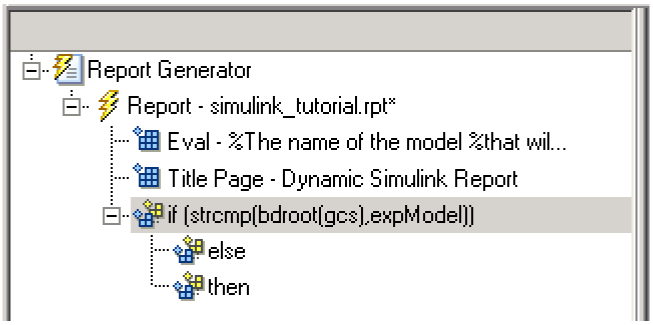
Report Generator
Report - simulink_tutorial.rpt*
Eval - %Evaluate this string in the bas...
Title Page - <No Title>
if (true)

2 In the Library pane in the middle, under the `Logical and Flow Control` category, double-click `Logical Then`.

3 In the Outline pane on the left, select the `if` component again.

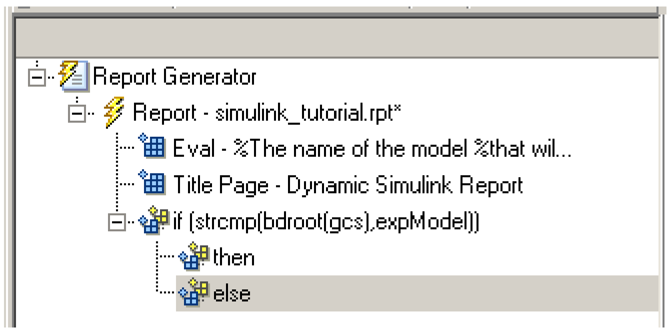
4 In the Library pane in the middle, under the `Logical and Flow Control` category, double-click `Logical Else`.

Both elements are added as child components to the if component, as shown in the Outline pane.



Report Generator
Report - simulink_tutorial.rpt*
Eval - %The name of the model %that wil...
Title Page - Dynamic Simulink Report
if (strcmp(bdroot(gcs),expModel))
else
then

5 To move the else component under the `then` component, select the else component and click the **down** arrow on the toolbar once. The Outline pane on the left looks as follows.


Report Generator
Report - simulink_tutorial.rpt*
Eval - %The name of the model %that wil...
Title Page - Dynamic Simulink Report
if (strcmp(bdroot(gcs),expModel))
then
else

6 Save the report setup file.

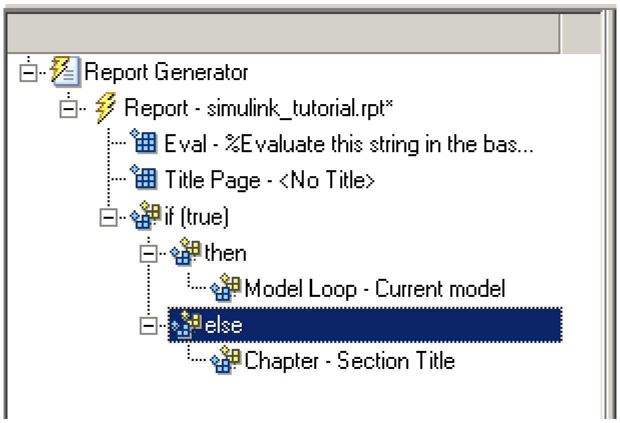
Error If Model Cannot Be Opened

Note: This section builds on the previous tasks described in the step-by-step example summarized in “Create a Simulink Report Generator Report” on page 3-2.

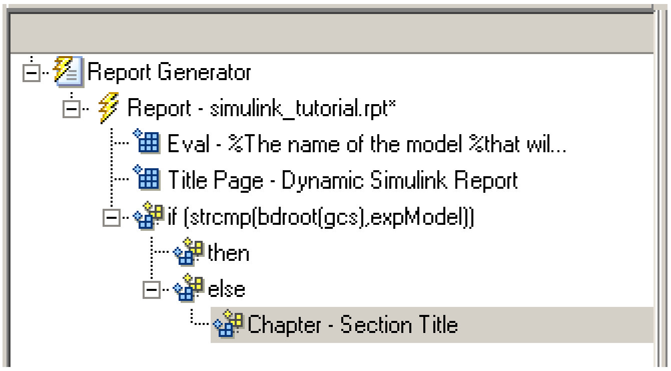
To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

If the `if strcmp(bdroot(gcs), expModel))` component fails (the vdp model cannot open), the `else` component executes. Display an error message in the report using the `Chapter/Subsection` component.

1 In the Outline pane on the left, select the `else` component.


Report Generator
Report - simulink_tutorial.rpt*
Eval - %Evaluate this string in the bas...
Title Page - <No Title>
if (true)
then
Model Loop - Current model
else
Chapter - Section Title

2 In the Library pane in the middle, under the `Formatting` category, double-click `Chapter/Subsection` to add it as a child of the `else` component. This component displays an error message if an error occurs when opening the vdp model.


Report Generator
Report - simulink_tutorial.rpt*
Eval - %The name of the model %that wil...
Title Page - Dynamic Simulink Report
if (strcmp(bdroot(gcs),expModel))
then
else
Chapter - Section Title

Note: When you add a component to a report, it is added by default as a child component unless the selected component cannot have child components.

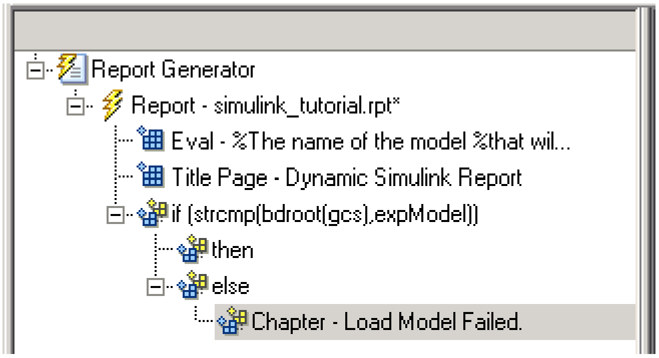
---

3 In the Properties pane on the right, choose `Custom` from the **Title** selection list, and then enter the following text in the text box:

```
Load Model Failed.
```

Save the report file.

The Outline pane looks as follows.



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
      else
        Chapter - Load Model Failed.
```

4 In the Outline pane on the left, select the `Chapter` component.

5 In the Library pane in the middle, under `Formatting`, double-click `Paragraph`.

6 In the Properties pane on the right, enter the following text in the **Paragraph Text** text box to display the following error message:

```
Error: Model %<expModel> could not be opened.
```

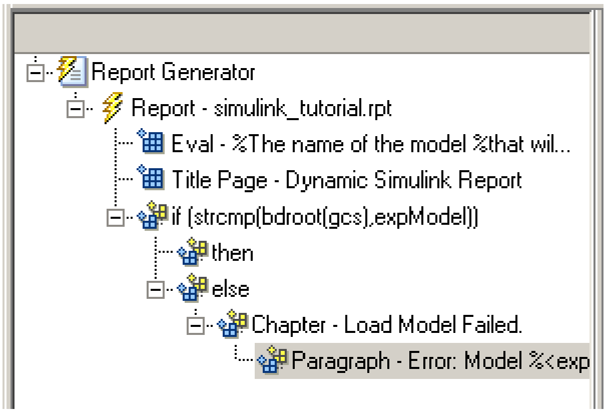
The expression `%<expModel>` indicates that the value of the workspace variable `expModel` is inserted into the text, as in the following example.

```
Error: Model vdp could not be opened.
```

7 In the Outline pane on the left, select the `Chapter/Section` component.

8 Save the report setup file.

The Outline pane looks as follows.



Report Generator
Report - simulink_tutorial.rpt
Eval - %The name of the model %that wil...
Title Page - Dynamic Simulink Report
if (strcmp(bdroot(gcs),expModel))
then
else
Chapter - Load Model Failed.
Paragraph - Error: Model %<exp

Create the Body of the Report

Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

Creating the body of the report involves setting up components and code for dynamic execution of report components. In this example, you perform the following tasks:

- "Process with a Model Loop Component" on page 3-22
- "Add a Paragraph for Each Model" on page 3-24
- "Insert a Snapshot of the Model" on page 3-25
- "Add a Loop for Processing the Model" on page 3-26
- "Block Parameter Value from a MATLAB Expression" on page 3-28
- "Create a Section for Each Iteration" on page 3-29
- "Insert the Block Value" on page 3-31
- "Set a Parameter Value" on page 3-32
- "Check Value Using a Logical If Component" on page 3-34

- “Simulate the Model Using a Model Simulation Component” on page 3-37
- “Create a Post-Test Analysis Section” on page 3-43

Each action requires a separate component under the `then` component. For information about the then component in this report, see “Add Logical Then and Logical Else Components” on page 3-16.

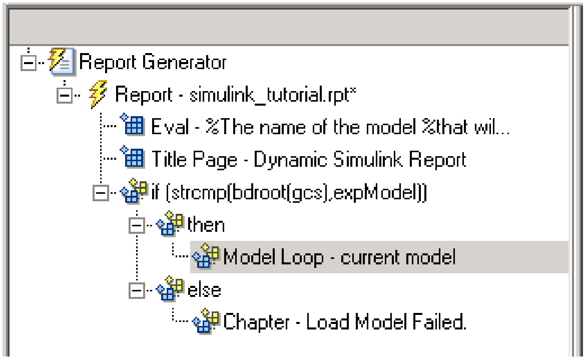
Process with a Model Loop Component

Note: This section builds on the previous tasks described in the step-by-step example summarized in “Create a Simulink Report Generator Report” on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`.

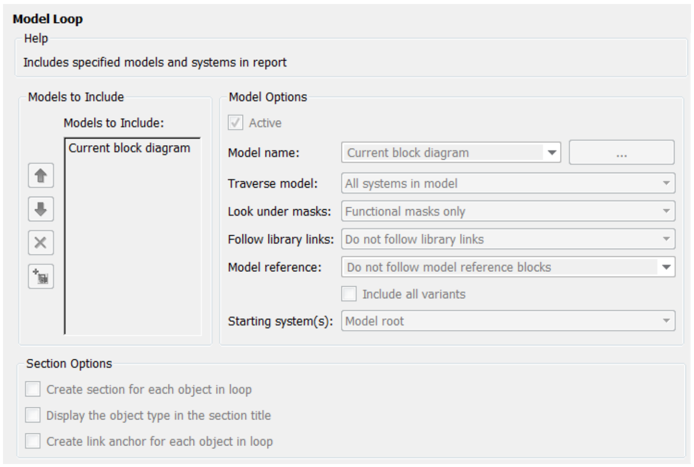
The report changes the `Gain` parameter for the `Mu` block in the vdp model several times. This task requires a `Model Loop` component.

1. In the Outline pane on the left, select the `then` component.
2. In the Library pane in the middle, scroll down to the `Simulink` category, and then double-click `Model Loop`. It is added as a child of the `then` component.



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop - current model
      else
        Chapter - Load Model Failed.
```

The Properties pane on the right looks as follows.


Model Loop
Help
Includes specified models and systems in report

Models to Include
Models to Include:
Current block diagram

Model Options
✓ Active
Model name: Current block diagram ...
Traverse model: All systems in model
Look under masks: Functional masks only
Follow library links: Do not follow library links
Model reference: Do not follow model reference blocks
☐ Include all variants
Starting system(s): Model root

Section Options
☐ Create section for each object in loop
☐ Display the object type in the section title
☐ Create link anchor for each object in loop

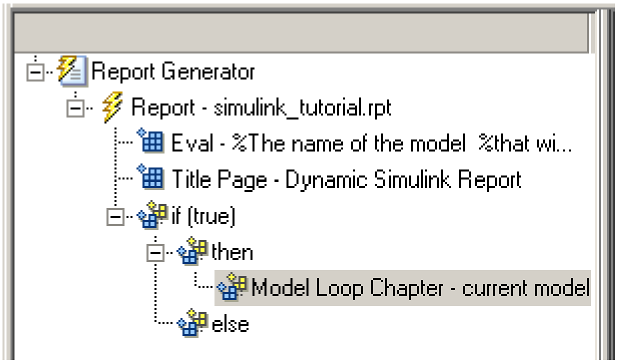
3 In the Properties pane on the right:

a Select the **Active** check box to process the vdp model.

b In the **Traverse model** selection list, select `Selected system(s) only` to traverse only the vdp model.

c Select `Model root` from the **Starting system(s)** selection list.

d At the bottom of the Properties pane on the left, select the **Create section for each object in loop** check box to create a chapter or section for each model. When you select this check box, the component name in the Outline pane on the left changes to `Model Loop Chapter`.


```
Report Generator
  Report - simulink_tutorial.rpt
    Eval - %The name of the model  %that wi...
    Title Page - Dynamic Simulink Report
    if (true)
      then
        Model Loop Chapter - current model
      else
```

   e Select the **Display the object type in the section title** check box to include the object type (in this example, model) in the title name.
   f Clear the **Create link anchor for each object in loop** check box.

4 Save the report setup file.

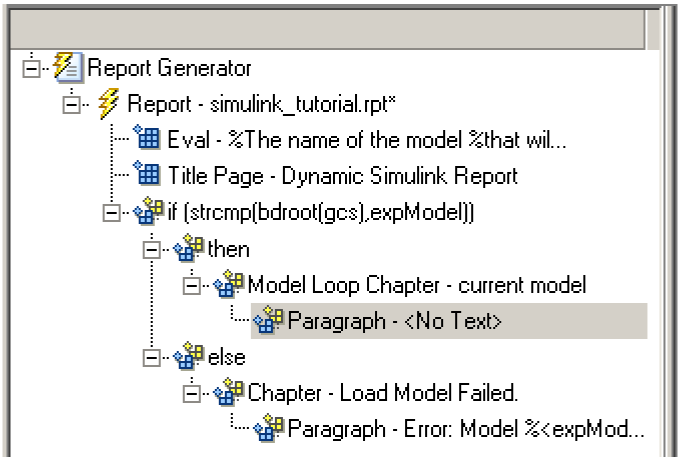
Add a Paragraph for Each Model

Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

In each Model Loop Chapter, add an explanation using the `Paragraph` component.

1 In the Outline pane on the left, select the `Model Loop Chapter` component.
2 In the Library pane in the middle, scroll up to the `Formatting` category, and then double-click `Paragraph`. The `Paragraph` component is added as a child of the `Model Loop Chapter` component.



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - <No Text>
      else
        Chapter - Load Model Failed.
          Paragraph - Error: Model %<expMod...
```

3 In the Properties pane on the right, in the **Paragraph Text** text box, enter the following text:

```
This report demonstrates Simulink Report Generator's ability
to experiment with Simulink systems and auto-document
the results. In this report, you load the model %<expModel>
and simulate it %<length> times. This report modifies the
%<expBlock> block's "%<expParam>" value, setting it to the
values %<expValue>. Each iteration of the test includes
a set of scope snapsnots in the report.
```

When this report is generated, the variable names preceded by percent signs (%) and enclosed in brackets (<>) are replaced with the values of those variables in the MATLAB workspace.

4. Save the report setup file.

Insert a Snapshot of the Model

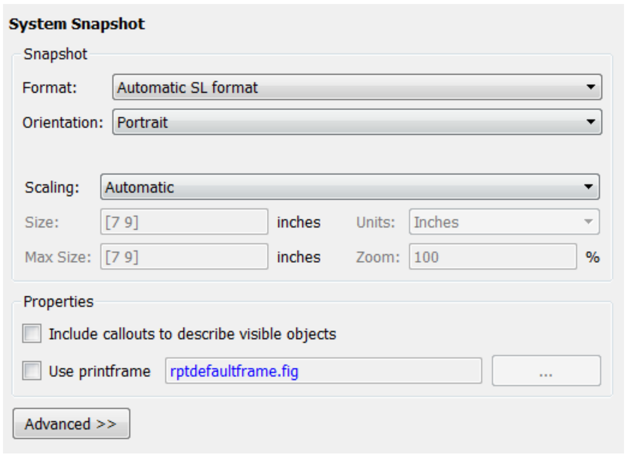
Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

Inside each `Model Loop Chapter` component, include a snapshot of the current model using the `System Snapshot` component.

1. In the Outline pane on the left, select the `Model Loop Chapter` component.
2. In the Library pane in the middle, scroll down to the `Simulink` category, and then double-click the `System Snapshot` component.

   This component inserts an image of the current model into your report. The Properties pane on the right looks as follows.


System Snapshot

Snapshot

Format: Automatic SL format

Orientation: Portrait

Scaling: Automatic

Size: [7 9] inches Units: Inches

Max Size: [7 9] inches Zoom: 100 %

Properties

☐ Include callouts to describe visible objects

☐ Use printframe rptdefaultframe.fig ...

Advanced >>

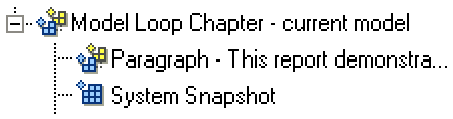
3 In the Properties pane on the right:

   a Select `Zoom` from the **Scaling** selection list.

   b Enter `70` as the % value.

4 In the Outline pane on the left, select the `System Snapshot` component.

5 Click the **down** arrow on the toolbar once to move it under the `Paragraph` component.


Model Loop Chapter - current model
Paragraph - This report demonstra...
System Snapshot

6 Save the report setup file.

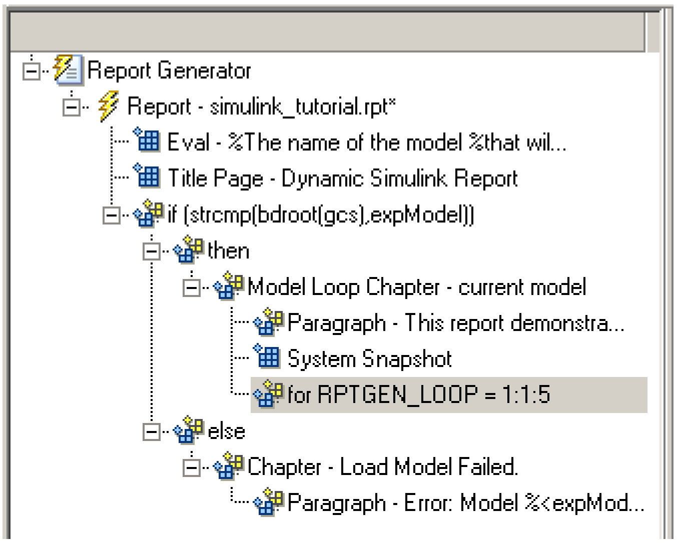
Add a Loop for Processing the Model

Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

Create a loop to process the model `%length` times using the `For Loop` component.

1. In the Outline pane on the left, select the `System Snapshot` component.
2. In the Library pane in the middle, under the `Logical and Flow Control` category, double-click `For Loop`. The `For Loop` component is added as a sibling of the `System Snapshot` component.



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for RPTGEN_LOOP = 1:1:5
      else
        Chapter - Load Model Failed.
          Paragraph - Error: Model %<expMod...
```

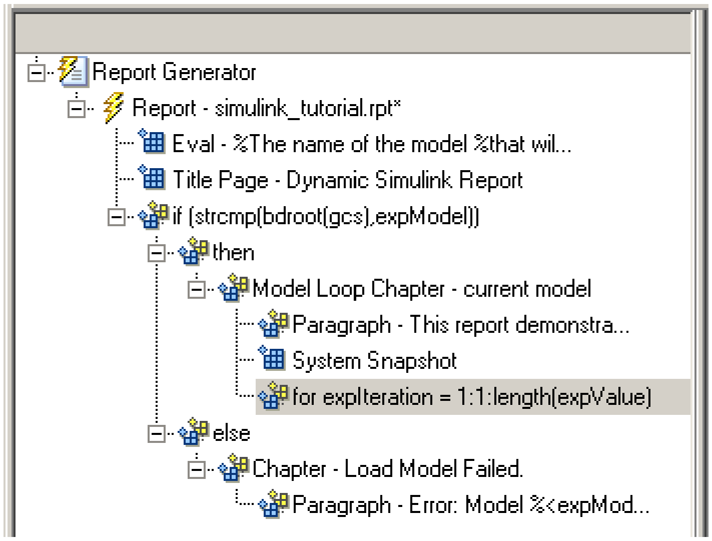
3. In the Properties pane on the right:

   a. In the **End** text box, replace the existing text with the following text:

      ```
      length(expValue)
      ```
      `expValue` is the array of `Gain` parameter values assigned in the `Eval` component with the command `expValue=[-1 0 0.5 1 2];`. The expression `length(expValue)` evaluates to `5` in this example.

   b. In the **Variable name** text box, replace the existing text with the name of the `for loop` variable. Enter the following text:

      ```
      expIteration
      ```
      The name of the `For` component in the Outline pane on the left changes to reflect the loop variable and the termination value.


Report Generator
Report - simulink_tutorial.rpt*
Eval - %The name of the model %that wil...
Title Page - Dynamic Simulink Report
if (strcmp(bdroot(gcs),expModel))
then
Model Loop Chapter - current model
Paragraph - This report demonstra...
System Snapshot
for expIteration = 1:1:length(expValue)
else
Chapter - Load Model Failed.
Paragraph - Error: Model %<expMod...

4. Save the report setup file.

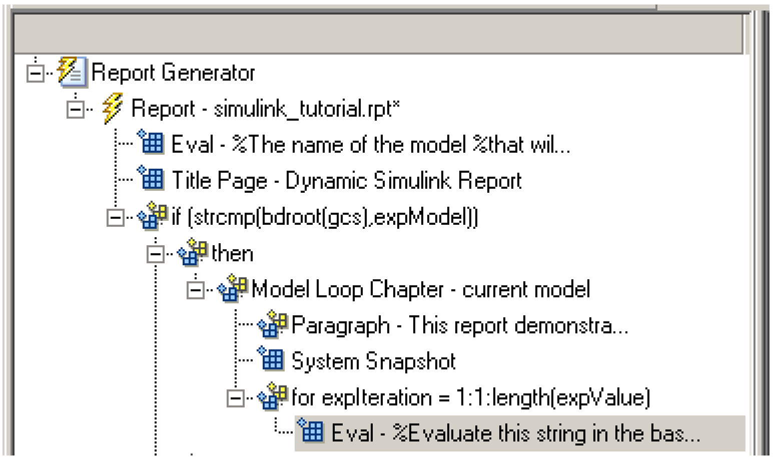
Block Parameter Value from a MATLAB Expression

Note: This section builds on the previous tasks described in the step-by-step example summarized in “Create a Simulink Report Generator Report” on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

For each iteration, get a value from the `expValue` array to use as the `Gain` parameter value. This task requires an `Evaluate MATLAB Expression` component.

1. In the Outline pane on the left, select the `for` component.
2. In the Library pane in the middle, under the `MATLAB` category, double-click `Evaluate MATLAB Expression`. In the Outline pane, the component name is shortened to `Eval`.



Report Generator
Report - simulink_tutorial.rpt*
Eval - %The name of the model %that wil...
Title Page - Dynamic Simulink Report
if (strcmp(bdroot(gcs),expModel))
then
Model Loop Chapter - current model
Paragraph - This report demonstra...
System Snapshot
for expIteration = 1:1:length(expValue)
Eval - %Evaluate this string in the bas...

3 On the Properties pane on the right:

a Clear the **Insert MATLAB expression in report** and **Display command window output in report** check boxes.

b Enter the following text in the **Expression to evaluate in the base workspace** text box:

```
%Evaluate this string in the base workspace

if iscell(expValue)
   Iteration_Value=expValue{expIteration};
else
  Iteration_Value=...
     num2str(expValue(expIteration));
end
```

The `Iteration_Value` variable represents the designated array element.

c Clear the **Evaluate expression if there is an error** check box.

4 Save the report setup file.

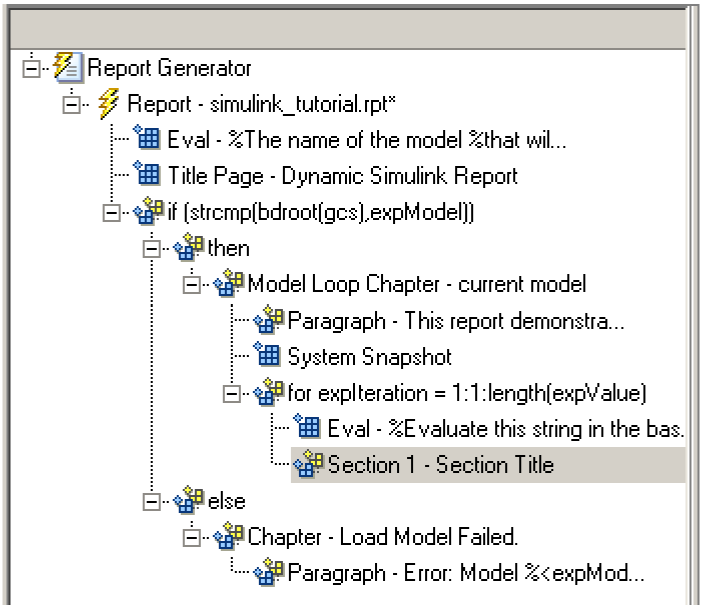
Create a Section for Each Iteration

Note: This section builds on the previous tasks described in the step-by-step example summarized in “Create a Simulink Report Generator Report” on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

Create a separate section for each iteration of the loop that includes the data using the `Chapter/Subsection` component.

1. In the Outline pane on the left, under the `for` component, select the `Eval` component.
2. In the Library pane in the middle, under the `Formatting` category, double-click the `Chapter/Subsection` component to add it as a sibling. This component is automatically added as `Section 1` because it is inside a `Chapter` component (the `Model Loop Chapter` component).



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas.
            Section 1 - Section Title
      else
        Chapter - Load Model Failed.
          Paragraph - Error: Model %<expMod...
```

3. In the Properties pane on the right:
   a. In the **Title** selection list, select `Custom`.
   b. In the text box, enter the following title:

      ```
      Processing the vdp model
      ```

This indicates that the section title comes from the first child component. Do not change any other properties.

4 Save the report setup file.

Insert the Block Value

Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

Insert the `Gain` value that is used for each simulation.

1 In the Outline pane on the left, select the `Section 1` component.

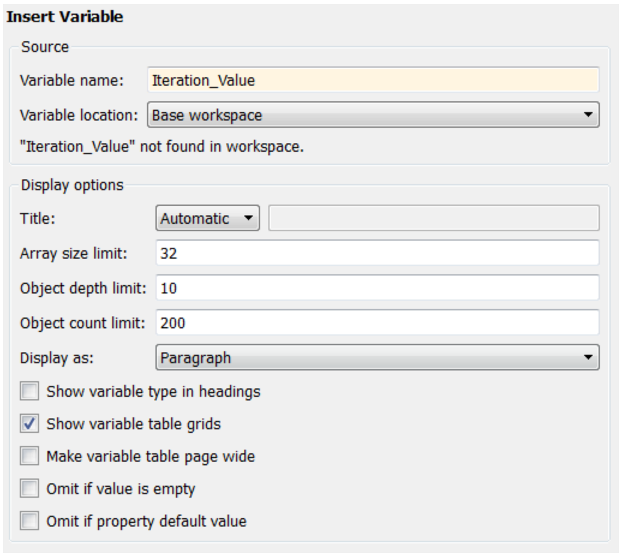
2 In the Library pane in the middle, under the `MATLAB` category, double-click `Insert Variable`.

3 In the Properties pane on the right:

   a In the **Variable name** text box, enter `Iteration_Value`.

   b In the **Display as** selection list, select `Paragraph`.

   The Properties pane on the right looks as follows.


Insert Variable

Source

Variable name: Iteration_Value

Variable location: Base workspace

"Iteration_Value" not found in workspace.

Display options

Title: Automatic

Array size limit: 32

Object depth limit: 10

Object count limit: 200

Display as: Paragraph

- [ ] Show variable type in headings
- [x] Show variable table grids
- [ ] Make variable table page wide
- [ ] Omit if value is empty
- [ ] Omit if property default value

4 Save the report setup file.

Set a Parameter Value

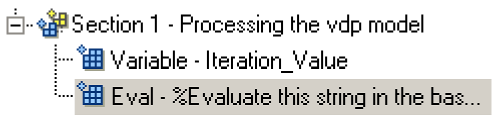
Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

For each iteration, set the `Gain` parameter to the value that you extracted from the `expValue` array.

1 In the Outline pane on the left, select the `Variable` component.

2 In the Library pane in the middle, under the `MATLAB` category, double-click `Evaluate MATLAB Expression`. This component is added as a sibling of the `Variable` component.


Section 1 - Processing the vdp model
Variable - Iteration_Value
Eval - %Evaluate this string in the bas...

3 In the Properties pane on the right, clear the **Insert MATLAB expression in report** and **Display command window output in report** check boxes.

4 In the **Expression to evaluate in the base workspace** text box, replace the existing text with the following text.

```
set_param(expBlock,expParam,Iteration_Value);
okSetValue=(1);
```

The `set_param` command sets the value of the `Gain` parameter for the `Mu` block in the vdp model to the value of `Iteration_Value`.

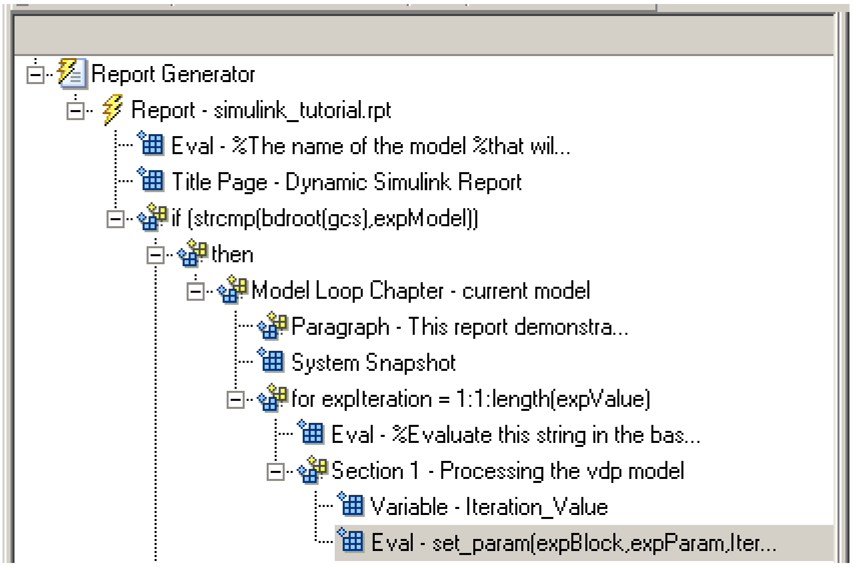
5 Make sure you select **Evaluate expression if there is an error**. Enter the following text into the text box:

```
okSetValue=logical(0);
```

If the `set_param` command works, `okSetValue` is set to `1`. If an error occurs, `okSetValue` is set to `0`. The next component then reports the error and terminates processing.

6 Save the report setup file.

The Outline pane on the left looks as follows.



```
Report Generator
  Report - simulink_tutorial.rpt
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas...
            Section 1 - Processing the vdp model
              Variable - Iteration_Value
              Eval - set_param(expBlock,expParam,Iter...
```

Check Value Using a Logical If Component

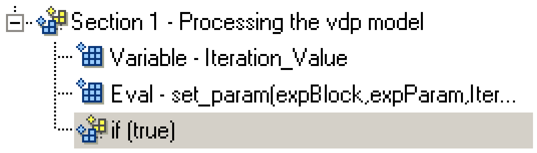
Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

Check the value of `okSetValue` using a `Logical If` component. If the value is `0`, the simulation cannot proceed because the `Gain` parameter could not be set.

1 In the Outline pane on the left, select the `Eval` component for the `set_param` command.

2 In the Library pane in the middle, under the `Logical and Flow Control` category, double-click `Logical If`. The component is added as a sibling of `Eval`.


Section 1 - Processing the vdp model
Variable - Iteration_Value
Eval - set_param(expBlock,expParam,Iter...
if (true)

3 In the Properties pane on the right, in the **Test expression** text box, replace `true` with `okSetValue`.

`okSetValue` can be `1` (`true`) or `0` (`false`), so insert two components — `Logical Then` and `Logical Else` — to process those conditions:

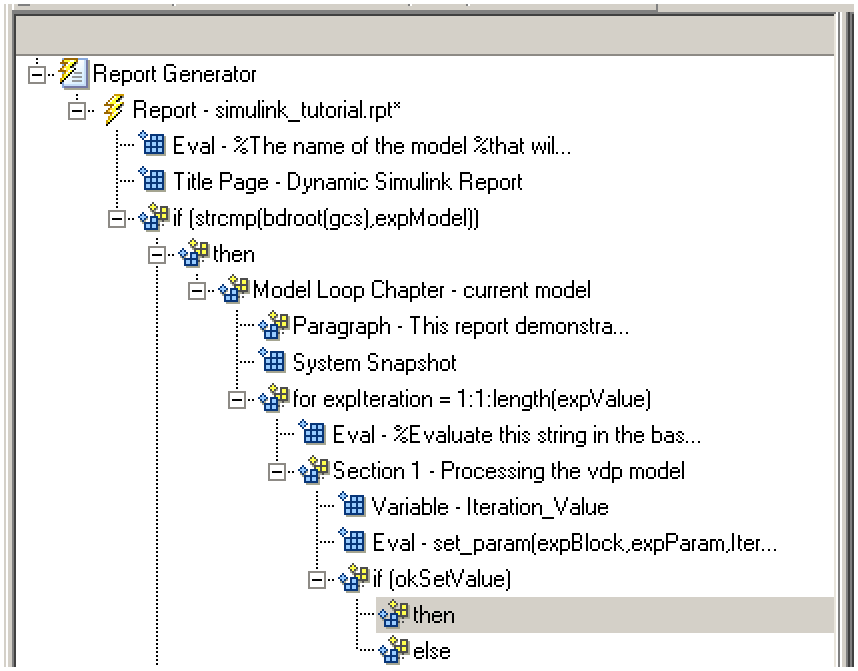
1 In the Outline pane on the left, select the `if(okSetValue)` component.

2 To insert `Logical Then` and `Logical Else` in the correct order:

   a In the Library pane in the middle, double-click the `Logical Else` component.

   b Select the `if(okSetValue)` component again.

   c Double-click the `Logical Then` component. The Outline pane on the left looks as follows.



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas...
            Section 1 - Processing the vdp model
              Variable - Iteration_Value
              Eval - set_param(expBlock,expParam,Iter...
              if (okSetValue)
                then
                else
```

3 In the Outline pane on the right, select the `else` component.

4 In the Library pane in the middle, double-click `Paragraph`.

   If `okSetValue` = `0`, the `Gain` parameter value is not set and the report displays an error.

5 In the Properties pane on the right:

   a Choose `Custom title` from the **Title Options** selection list.

   b Enter `Error` in the text box next to the selection list.

   c Enter the following text into the **Paragraph Text** text box:

   ```
   Could not set %<expBlock> "%<expParam>" to value
   %<Iteration_Value>.
   ```

6 Save the report.

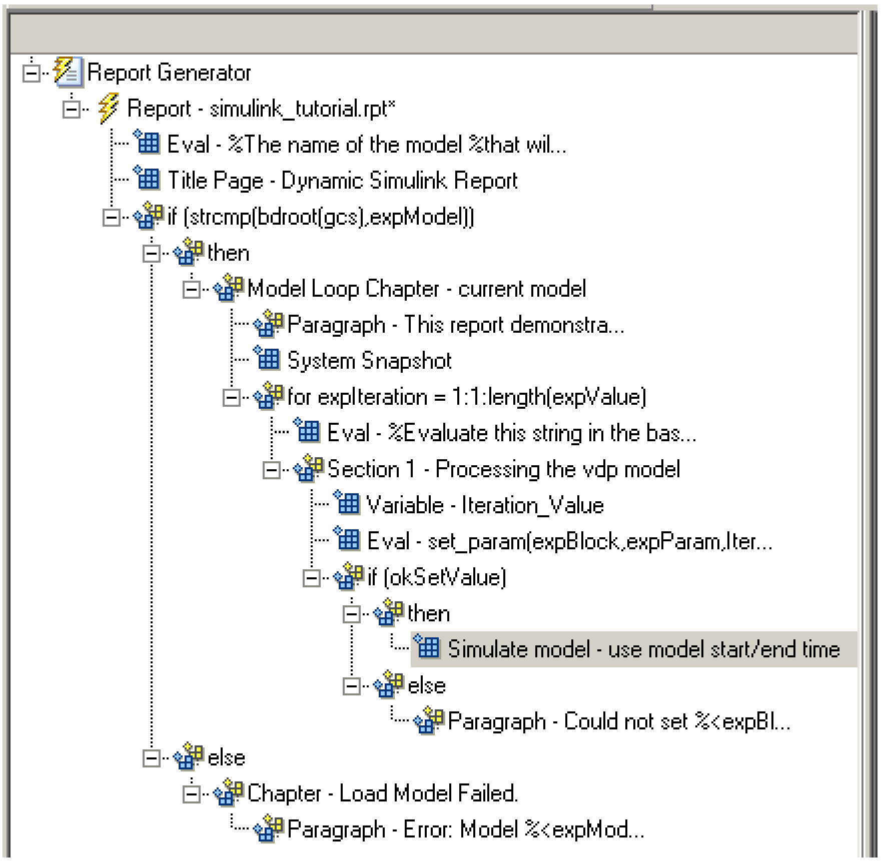
Simulate the Model Using a Model Simulation Component

Note: This section builds on the previous tasks described in the step-by-step example summarized in “Create a Simulink Report Generator Report” on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

Now that the model is open and the `Gain` parameter is set, use the `Model Simulation` component to simulate the vdp model.

1 In the Outline pane on the left, select the `then` component under the `if (okSetValue)` component.
2 In the Library pane, under the `Simulink` category, double-click `Model Simulation`. In the Outline pane on the left, this component is renamed `Simulate model`.



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas...
            Section 1 - Processing the vdp model
              Variable - Iteration_Value
              Eval - set_param(expBlock,expParam,Iter...
              if (okSetValue)
                then
                  Simulate model - use model start/end time
                else
                  Paragraph - Could not set %<expBl...
      else
        Chapter - Load Model Failed.
          Paragraph - Error: Model %<expMod...
```

3 In the Properties pane on the right:

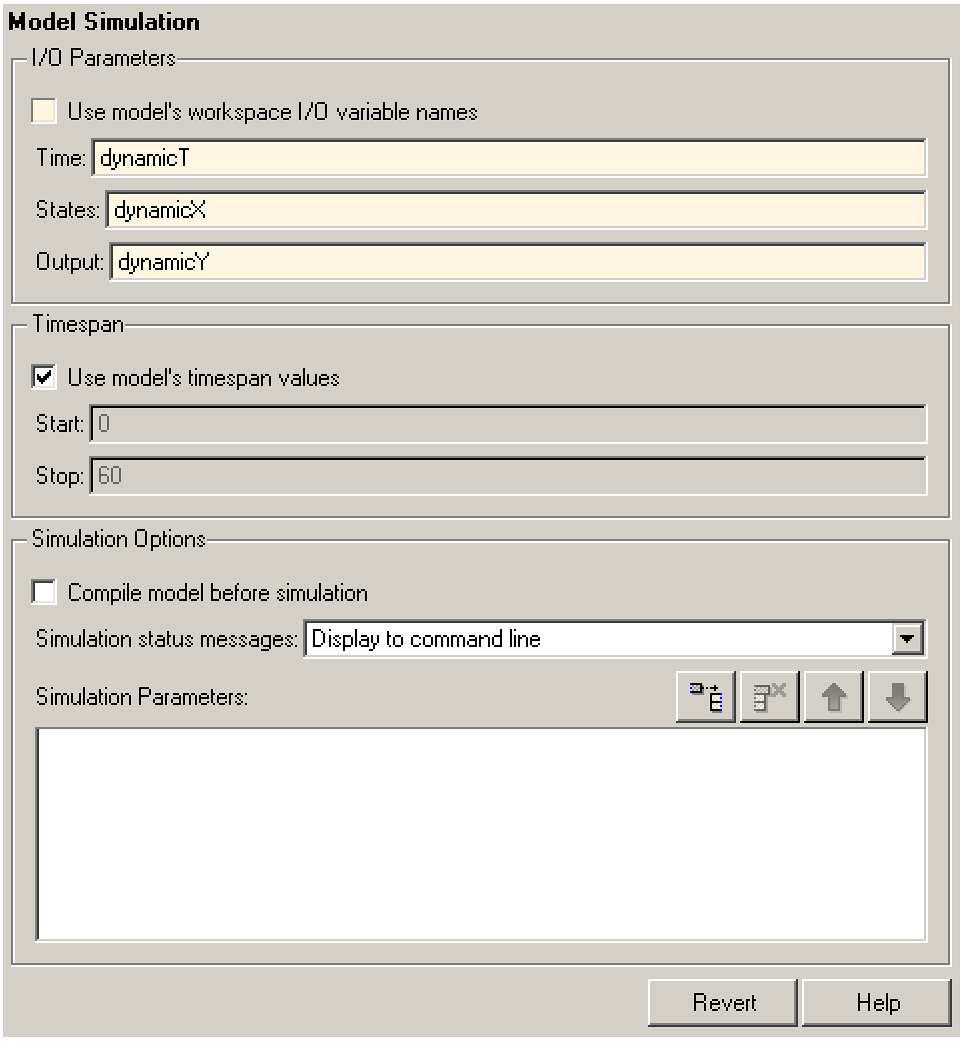
a Clear the **Use model's workspace I/O variable names** check box.

b In the **Time** text box, enter `dynamicT`.

c In the **States** text box, enter `dynamicX`.

d In the **Output** text box, enter `dynamicY`.

The Properties pane on the right looks as follows.


Model Simulation

I/O Parameters

☐ Use model's workspace I/O variable names

Time: dynamicT

States: dynamicX

Output: dynamicY

Timespan

☑ Use model's timespan values

Start: 0

Stop: 60

Simulation Options

☐ Compile model before simulation

Simulation status messages: Display to command line

Simulation Parameters:

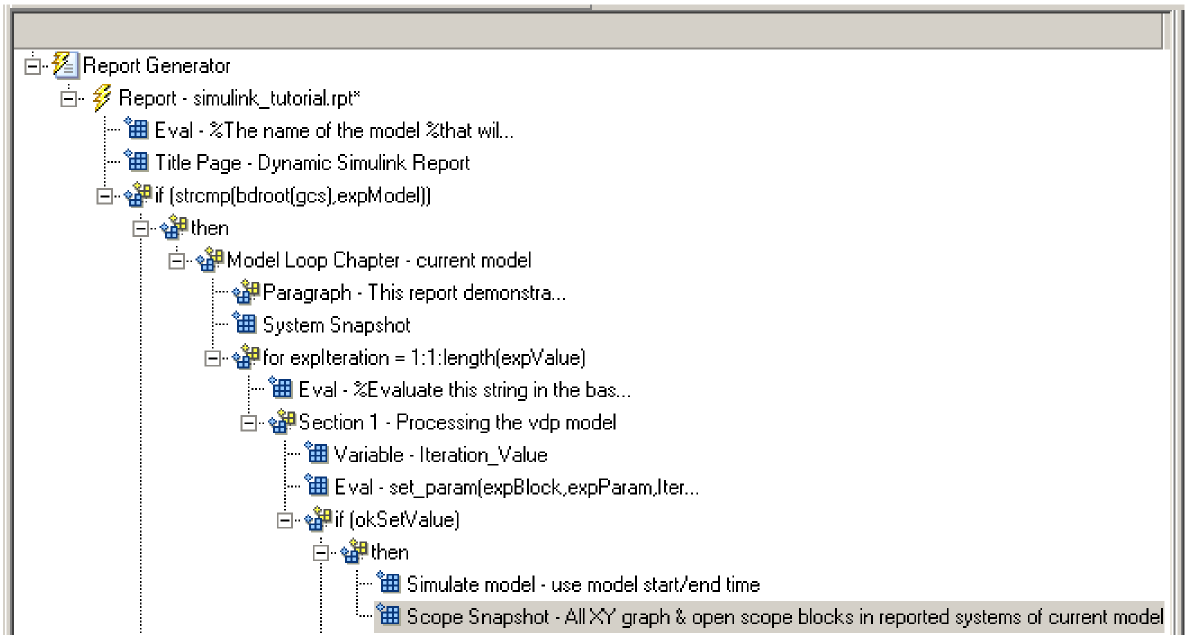
4 In the Outline pane on the left, select the `Simulate model` component.

5 In the Library pane in the middle:

  a Scroll down to the `Simulink Blocks` category.

  b Double-click `Scope Snapshot` to add it as a sibling of the `Simulink Model` component.

This component captures the scope for each iteration.



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas...
            Section 1 - Processing the vdp model
              Variable - Iteration_Value
              Eval - set_param(expBlock,expParam,Iter...
              if (okSetValue)
                then
                  Simulate model - use model start/end time
                  Scope Snapshot - All XY graph & open scope blocks in reported systems of current model
```

6 In the Properties pane on the right:

   a In the **Paper orientation** selection list, select `Portrait`.

   b For the **Image size**, enter `[5 4]`.

   c In the **Scaling** selection list, select `Zoom`.

   d Enter `75` for the % value.

7 Save the report setup file.

8 To test to see if the signal data falls within a specified range, add another `Logical If` component:

   a In the Outline pane on the left, select the `Scope Snapshot` component.

   b In the Library pane in the middle, scroll up to the `Logical and Flow Control` category.

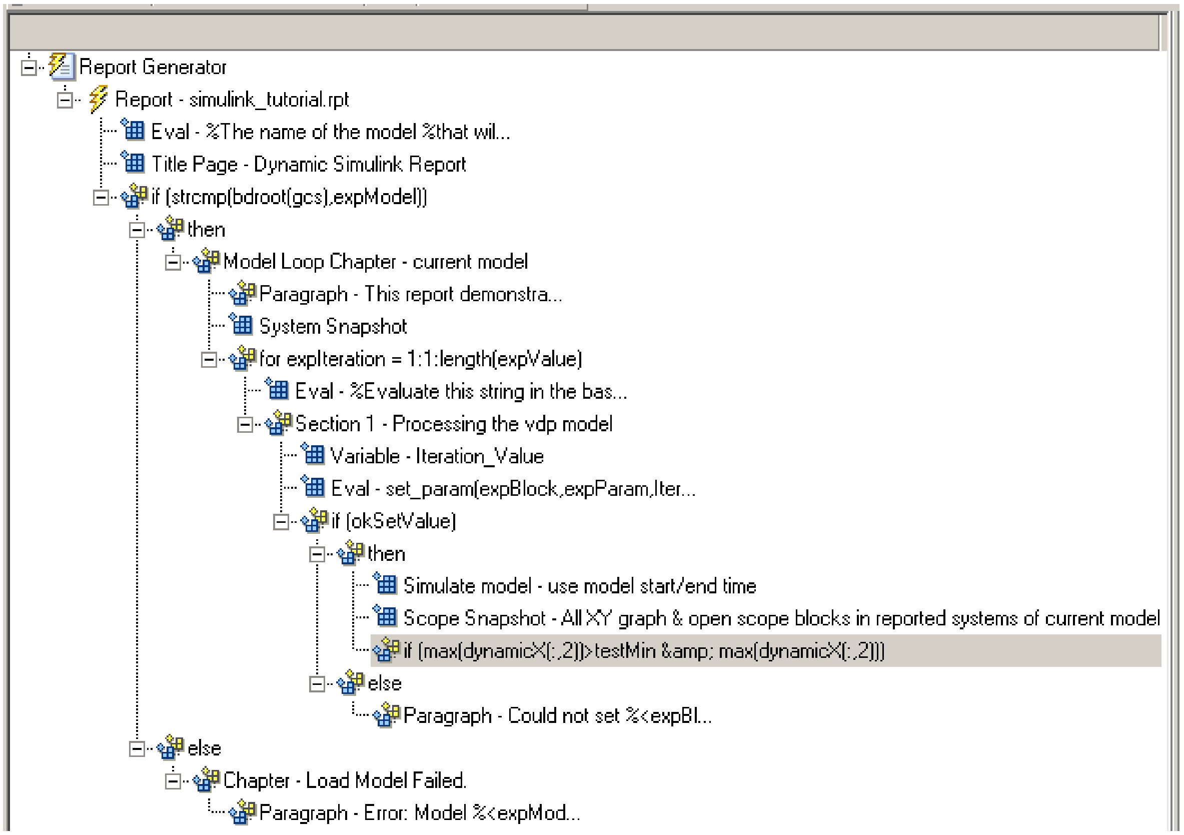
   c Double-click the `Logical If` component.

9 To test the signal data, replace `true` in the **Test expression** text box with the following in the Properties pane on the right:

```
max(dynamicX(:,2))>testMin & max(dynamicX(:,2))
```

10 Save the report.

The Outline pane looks as follows:

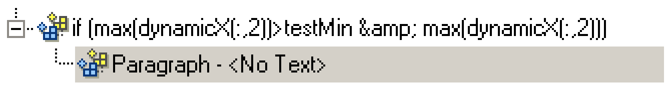


```
Report Generator
  Report - simulink_tutorial.rpt
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas...
            Section 1 - Processing the vdp model
              Variable - Iteration_Value
              Eval - set_param(expBlock,expParam,Iter...
              if (okSetValue)
                then
                  Simulate model - use model start/end time
                  Scope Snapshot - All XY graph & open scope blocks in reported systems of current model
                  if (max(dynamicX(:,2))>testMin &amp; max(dynamicX(:,2)))
                else
                  Paragraph - Could not set %<expBl...
      else
        Chapter - Load Model Failed.
          Paragraph - Error: Model %<expMod...
```

11 If this condition is true, the signal data falls within the desired range. Add a `Paragraph` component to print information about the signal data in the report.

a In the Outline pane on the left, select the `if` component you just added.

b In the Library pane in the middle, under the `Formatting` category, double-click `Paragraph` so that it becomes a child of the `if` component.


if (max(dynamicX(:,2))>testMin &amp; max(dynamicX(:,2)))
Paragraph - <No Text>

c In the Properties pane on the right:

i From the **Title Options** selection list, select `Custom title`.

ii Type `Success` in the text box.

iii Enter the following text in the **Paragraph text** text box.

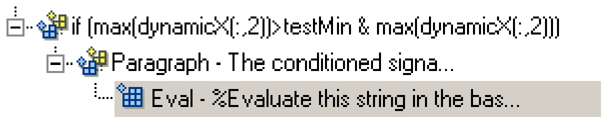
```
The conditioned signal has a maximum value
of %<max(dynamicX(:,2))>, which lies in the
desired range of greater than %<testMin> and
less than %<testMax>.
```

12 To save the success values to insert into a table at the end of the iterations, use an `Evaluate MATLAB Expression` component.

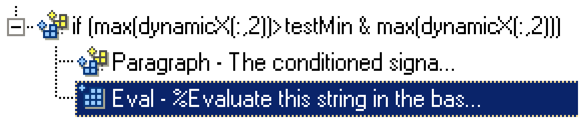
a In the Outline pane on the left, select the `Paragraph` component.

b In the Library pane in the middle, under the `MATLAB` category, double-click `Evaluate MATLAB Expression`.

An unintended result occurs: the new component is a child of the `Paragraph` component.


if (max(dynamicX(:,2))>testMin & max(dynamicX(:,2)))
Paragraph - The conditioned signa...
Eval - %Evaluate this string in the bas...

c To make the new component a *sibling* of the `Paragraph` component, in the Outline pane on the left, select the `Eval` component, and then Click the left arrow on the toolbar. The `Eval` component becomes a sibling of the `Paragraph` component.


if (max(dynamicX(:,2))>testMin & max(dynamicX(:,2)))
Paragraph - The conditioned signa...
Eval - %Evaluate this string in the bas...

13 In the Properties pane on the right, for the `Eval` component:

a. Clear the **Insert MATLAB expression in report** and **Display command window output in report** check boxes.

b. In the **Expression to evaluate in the base workspace** text box, enter the following to save the desired signal values in the `expOkValues` array:

```
expOkValues=[expOkValues;...
     {Iteration_Value,max(dynamicX(:,2))}];
```

c. Make sure you select **Evaluate this expression if there is an error**. Insert the following text in the text box:

```
disp(['Error during eval: ', evalException.message])
```

14 Save the report setup file.

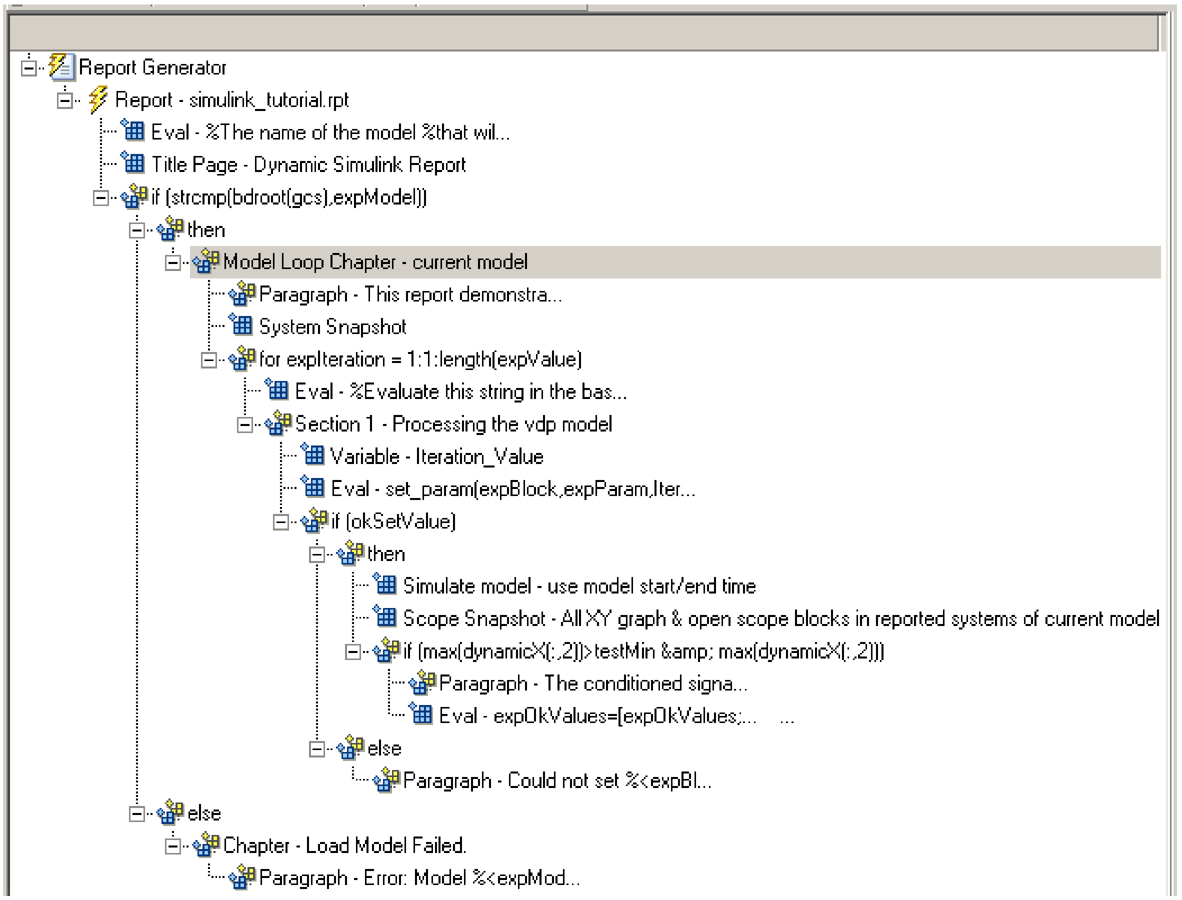
Create a Post-Test Analysis Section

Note: This section builds on the previous tasks described in the step-by-step example summarized in "Create a Simulink Report Generator Report" on page 3-2.

To see the completed report setup file, open `Simulink Dynamic Report`. The report is for the `vdp` model.

Now that you have collected all the desired values, create the post-test analysis section by creating a table and inserting it into your report at the end of this chapter.

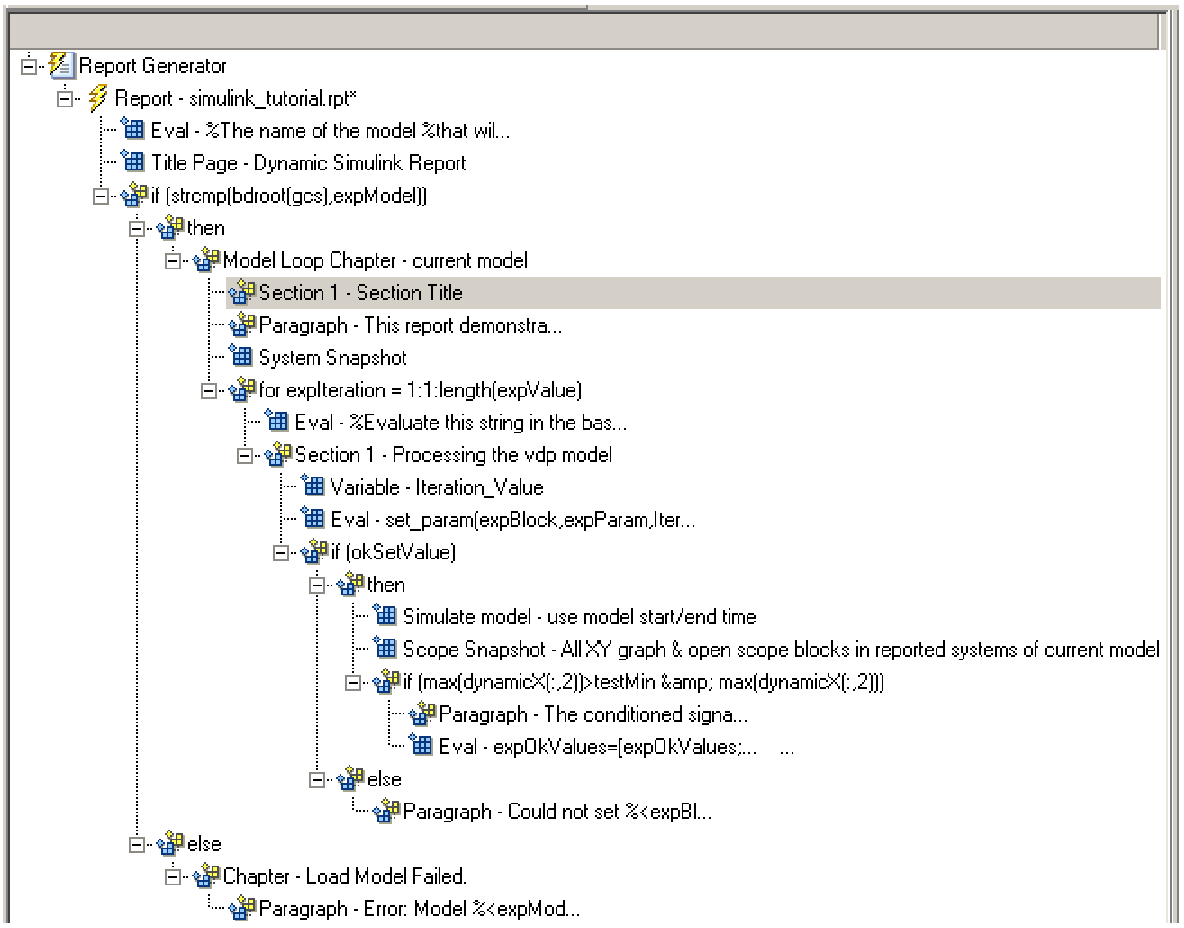
1 In the Outline pane on the left, select the `Model Loop Chapter` component.



```
Report Generator
  Report - simulink_tutorial.rpt
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas...
            Section 1 - Processing the vdp model
              Variable - Iteration_Value
              Eval - set_param(expBlock,expParam,Iter...
              if (okSetValue)
                then
                  Simulate model - use model start/end time
                  Scope Snapshot - All XY graph & open scope blocks in reported systems of current model
                  if (max(dynamicX(:,2))>testMin &amp; max(dynamicX(:,2)))
                    Paragraph - The conditioned signa...
                    Eval - expOkValues=[expOkValues;...    ...
                else
                  Paragraph - Could not set %<expBl...
      else
        Chapter - Load Model Failed.
          Paragraph - Error: Model %<expMod...
```

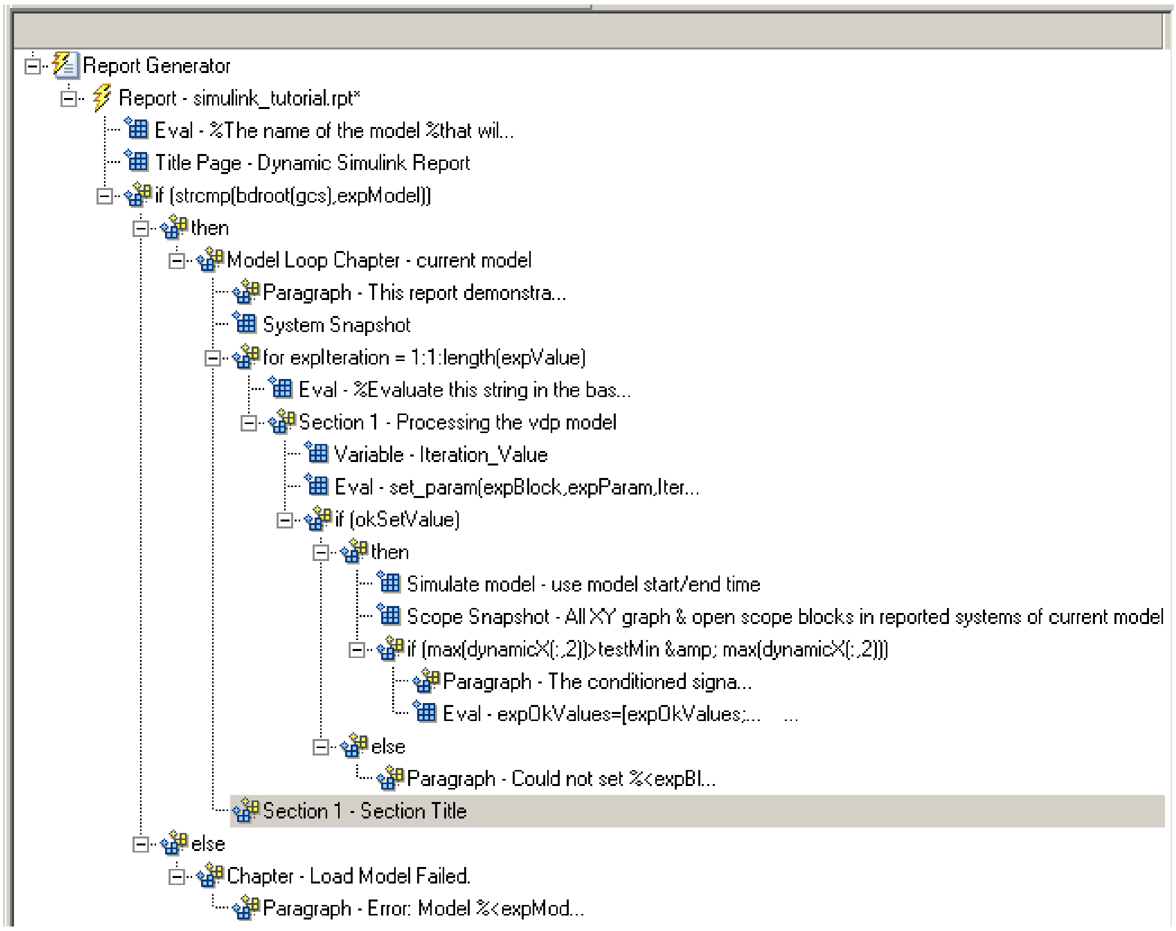
2 In the Library pane in the middle, under the `Formatting` category, double-click `Chapter/Subsection`.

The new section appears at the beginning of the chapter.



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Section 1 - Section Title
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas...
            Section 1 - Processing the vdp model
              Variable - Iteration_Value
              Eval - set_param(expBlock,expParam,Iter...
              if (okSetValue)
                then
                  Simulate model - use model start/end time
                  Scope Snapshot - All XY graph & open scope blocks in reported systems of current model
                  if (max(dynamicX(:,2))>testMin &amp; max(dynamicX(:,2)))
                    Paragraph - The conditioned signa...
                    Eval - expOkValues=[expOkValues;...    ...
                else
                  Paragraph - Could not set %<expBl...
      else
        Chapter - Load Model Failed.
          Paragraph - Error: Model %<expMod...
```

Click the **down** arrow three times so `Section 1` moves to the end of the `Model Loop Chapter` component.



```
Report Generator
  Report - simulink_tutorial.rpt*
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        Model Loop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas...
            Section 1 - Processing the vdp model
              Variable - Iteration_Value
              Eval - set_param(expBlock,expParam,Iter...
              if (okSetValue)
                then
                  Simulate model - use model start/end time
                  Scope Snapshot - All XY graph & open scope blocks in reported systems of current model
                  if (max(dynamicX(:,2))>testMin &amp; max(dynamicX(:,2)))
                    Paragraph - The conditioned signa...
                    Eval - expOkValues=[expOkValues;...    ...
                else
                  Paragraph - Could not set %<expBl...
          Section 1 - Section Title
      else
        Chapter - Load Model Failed.
          Paragraph - Error: Model %<expMod...
```

3 In the Properties pane on the right:

a Select `Custom` in the **Title** selection list.

b Enter `Post-Test Analysis` in the text box.

4 In the Outline pane on the left, select the new `Section 1` component.

5 In the Library pane in the middle, under the `Formatting` category, double-click `Paragraph`. Do not change its properties.

6 To check whether there are any signal values within the desired range, check the array `expOkValues` with a `Logical If` component. If `expOkValues` is empty, there are no signal values in the desired range. Report the result of this check.

   a In the Outline pane on the left, select the `Paragraph` component and add a `Logical If` child component.

   b In the Properties pane on the right, enter the expression to evaluate in the **Test expression** text box:

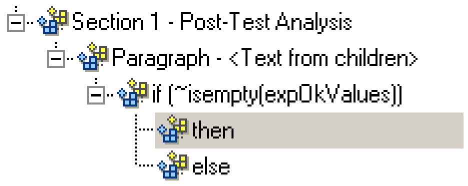
   ```
   ~isempty(expOkValues)
   ```

   This expression evaluates to `0` (`false`) if `expOkValues` is empty; otherwise, it evaluates to `1` (`true`).

   c In the Outline pane on the left, select the `if(~isempty(expOkValue))` component and add the `Logical Else` component as a child.

   d Select the `if(~isempty(expOkValue))` component again and add the `Logical Then` component as a child.

   The two components are siblings in the Outline pane on the left.


Section 1 - Post-Test Analysis
Paragraph - <Text from children>
if (~isempty(expOkValues))
then
else

7 Save the report setup file.

8 Now, insert report components to handle the case where `expOkValues` is empty; that is, where no signal values fall within the designated range.

   a In the Outline pane on the left, select the `else` component.

   b In the Library pane in the middle, double-click the `Text` component to add it as a child of the `else` component.

   c In the Properties pane on the right, in the **Text to include in report** text box, enter the following:

   ```
   None of the selected iteration values had
   a maximum signal value between %<testMin> and %<testMax>.
   ```

9 Now handle the case where `expOkValues` is not empty and you want to insert a table of the acceptable signal values.

a. In the Outline pane on the left, select the `then` component.
b. Add a `Text` component as a child to the `then` component.
c. In the Properties pane on the right, in the **Text to include in report** text box, enter the following text.

   ```
   %<size(expOkValues, 1)> values for %<expBlock> were
   found that resulted in a maximum signal value greater
   than %<testMin> but less than %<testMax>. The following
   table shows those values and their resulting signal maximum.
   ```
d. In the Outline pane on the left, select the `Text` component under the `then` component of the `if(~isempty(expOkValues))` component.

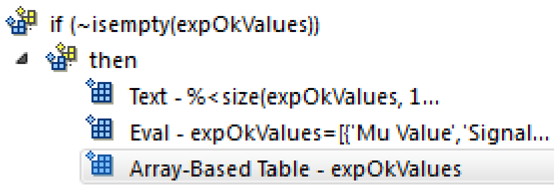
10. To create an array for use when formatting the table, use the `Evaluate MATLAB Expression` component.

   a. In the Library pane in the middle, double-click `Evaluate MATLAB Expression`.
   b. In the Properties pane on the right:

      i. Clear the **Insert MATLAB expression in report** and **Display command window output in report** check boxes.
      ii. The next component of the report uses the strings `Mu Value` and `Signal Maximum` as table header values. Add the strings to the front of the `expOkValues` cell array by entering the following text into the **Expression to evaluate in the base workspace** text box:

      ```
      expOkValues=[{'Mu Value','Signal Maximum'} expOkValues];
      ```
      iii. Make sure you select the **Evaluate this expression if there is an error** check box. Enter the following text into the text box:

      ```
      disp(['Error during eval: ', evalExpression.message])
      ```
11. In the Outline pane on the left, select the `Eval` component.
12. In the Library pane in the middle, under the `Formatting` category, double-click the `Table` component so it becomes a sibling of the `Text` and `Eval` components.


```
if (~isempty(expOkValues))
  then
    Text - %<size(expOkValues, 1...
    Eval - expOkValues=[{'Mu Value','Signal...
    Array-Based Table - expOkValues
```

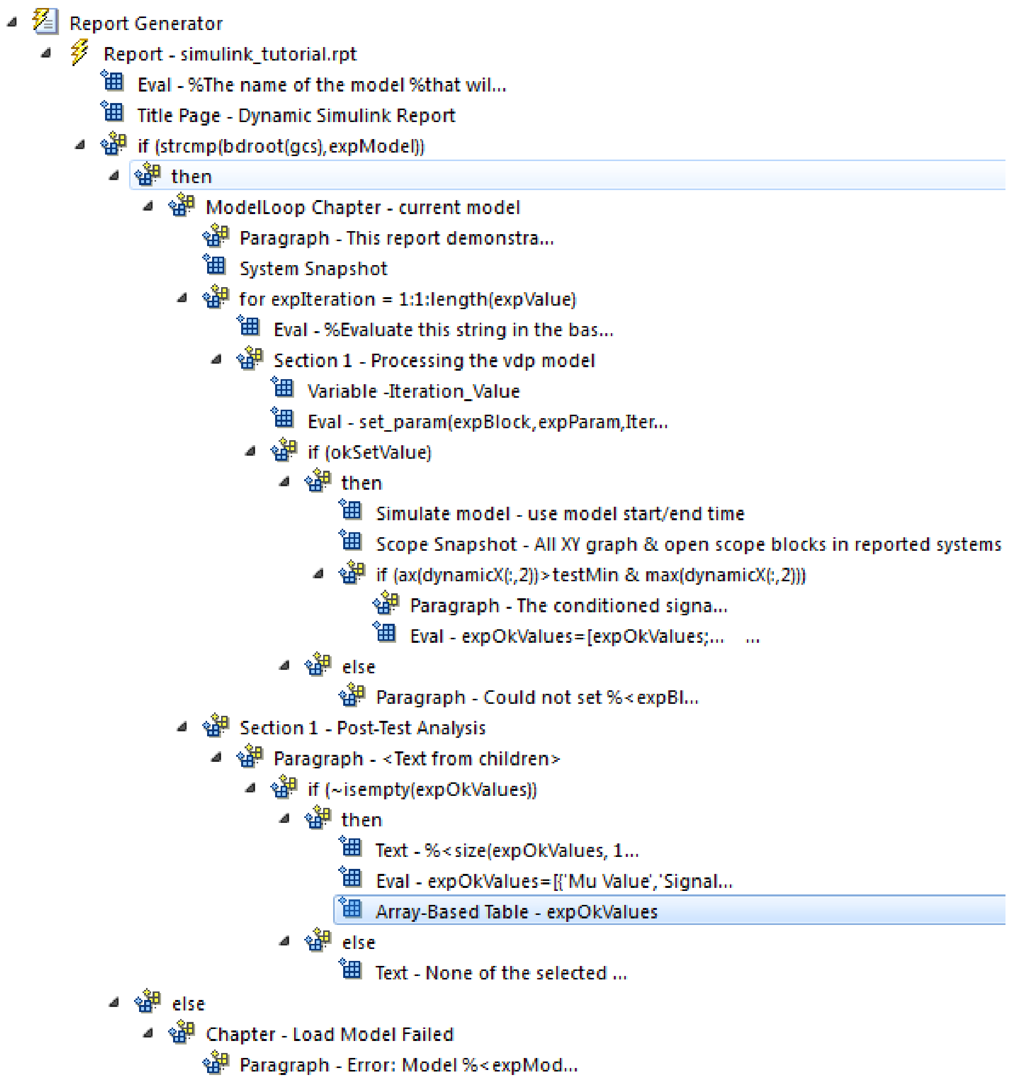
13 In the Properties pane on the right:

   a In the **Workspace variable name** text box, enter `expOkValues`. The Simulink Report Generator software uses the contents of `expOkValues` to construct the table.

   b In the **Table title** text box, enter `Valid Iteration Values`.

14 Save the report setup file.

The Outline pane on the left looks as follows.



```
Report Generator
  Report - simulink_tutorial.rpt
    Eval - %The name of the model %that wil...
    Title Page - Dynamic Simulink Report
    if (strcmp(bdroot(gcs),expModel))
      then
        ModelLoop Chapter - current model
          Paragraph - This report demonstra...
          System Snapshot
          for expIteration = 1:1:length(expValue)
            Eval - %Evaluate this string in the bas...
            Section 1 - Processing the vdp model
              Variable -Iteration_Value
              Eval - set_param(expBlock,expParam,Iter...
              if (okSetValue)
                then
                  Simulate model - use model start/end time
                  Scope Snapshot - All XY graph & open scope blocks in reported systems
                  if (ax(dynamicX(:,2))>testMin & max(dynamicX(:,2)))
                    Paragraph - The conditioned signa...
                    Eval - expOkValues=[expOkValues;...    ...
                else
                  Paragraph - Could not set %<expBl...
          Section 1 - Post-Test Analysis
            Paragraph - <Text from children>
              if (~isempty(expOkValues))
                then
                  Text - %<size(expOkValues, 1...
                  Eval - expOkValues=[{'Mu Value','Signal...
                  Array-Based Table - expOkValues
                else
                  Text - None of the selected ...
      else
        Chapter - Load Model Failed
          Paragraph - Error: Model %<expMod...
```

Error Handling for MATLAB Code

You can add MATLAB code to a report, by using the `Evaluate MATLAB Expression` component (also called the Eval component). See "Add MATLAB Code" on page 3-7 for details.

The Evaluate MATLAB Expression component dialog box includes an **Evaluate this expression if there is an error** check box. The dialog box includes default error handling code that you can use, or you can create your own error handling code.

If you do not change the default error handling code, then when you generate the report, and there is an error in the MATLAB code that you added:

- If you clear **Evaluate this expression if there is an error** check box, then the complete report is generated, without displaying an error message at the MATLAB command line.
- If you select **Evaluate this expression if there is an error** check box, then the complete report is generated and an error message appears at the MATLAB command line.

To stop report generation when an error occurs in the MATLAB code that you added, change the second and third lines of the following default error handling code, as described below:

```
warningMessageLevel = 2;
displayWarningMessage = true;
failGenerationWithException = false;
failGenerationWithoutException = false;
```

To stop report generation and display an exception, change the default code to:

```
displayWarningMessage = false;
failGenerationWithException = true;
```

To stop report generation without displaying an exception, change the default code to:

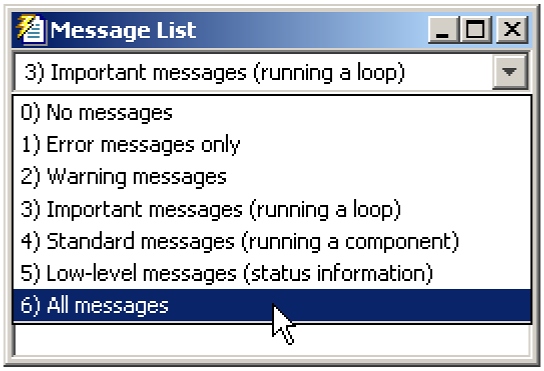
```
displayWarningMessage = false;
failGenerationWithoutException = true;
```

If you want to completely replace the default error handling code, use the `evalException.message` variable in your code to return information for the exception.

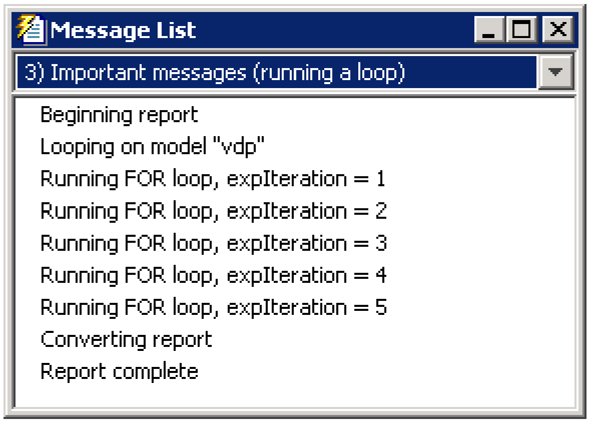
Generate the Report

To generate the report, click the Report icon on the toolbar. The following occurs:

1 A Message List window appears, displaying informational and error messages as the report is processed. Specify the level of detail you would like the Message List window to display while the report is being generated. Options range from `0` (least detail) to `6`(most detail). Click the selection list located under the title bar of the Message List window to choose an option, as shown in the following figure.


Message List
3) Important messages (running a loop)
0) No messages
1) Error messages only
2) Warning messages
3) Important messages (running a loop)
4) Standard messages (running a component)
5) Low-level messages (status information)
6) All messages

`Message level 3 (Important messages)` is used for the remainder of this example.

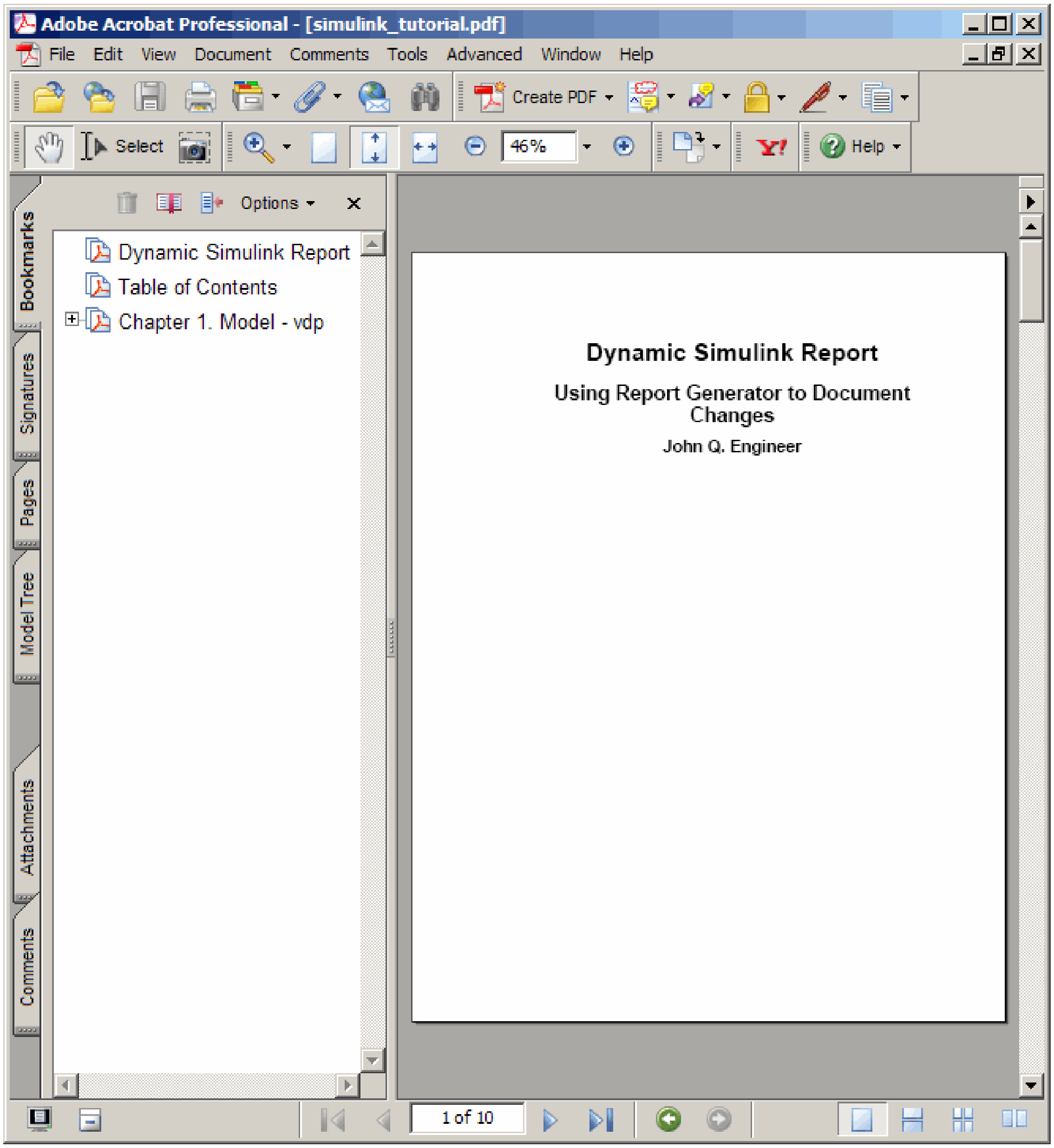


```
Beginning report
Looping on model "vdp"
Running FOR loop, expIteration = 1
Running FOR loop, expIteration = 2
Running FOR loop, expIteration = 3
Running FOR loop, expIteration = 4
Running FOR loop, expIteration = 5
Converting report
Report complete
```

2 The vdp model appears. You can see each time it is simulated.

3. The scope window appears. The scope graph changes each time the parameter value changes.
4. Each component of the report is highlighted as it executes, in the Outline pane on the left in the Report Explorer window.

When the report is complete, Adobe® Acrobat® Reader opens your report in PDF format.


Adobe Acrobat Professional - [simulink_tutorial.pdf]
File Edit View Document Comments Tools Advanced Window Help
Create PDF
Select
46%
Help
Options
Bookmarks
Signatures
Pages
Model Tree
Attachments
Comments
1 of 10

Dynamic Simulink Report

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Chapter 1. Model - vdp

Dynamic Simulink Report

Using Report Generator to Document Changes

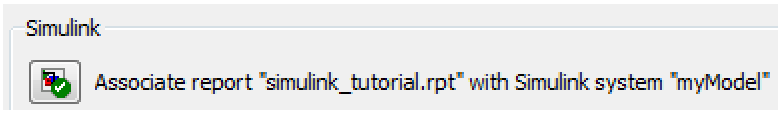
John Q. Engineer

Generate a Report Associated with a Model

You can associate a report with your model. By associating a report with a model, you can use a script to generate the report without specifying the name of the report. You can change the association without modifying the script.

Associating a report with a model sets the model parameter `ReportName` to the name of the report. Each model can have only one report associated with it. You can associate the same report with more than one model.

1. Open the model you want to associate with a report.
2. In the Report Explorer, from the hierarchy view, select `Report Generator`. The library pane lists your reports.
3. Select the report you want to associate with your model.
4. In the properties pane, under **Simulink**, click **Associate report with Simulink system**. The report and model names are part of the button label.


Simulink
Associate report "simulink_tutorial.rpt" with Simulink system "myModel"

5. Save the model.
6. Create a script to generate the report using `report`. Make sure the model and report template are on the MATLAB path when you run the script.

```
load_system('myModel')
report(get_param('myModel','ReportName'))
bdclose('myModel')
```

You can clear the association clicking **Un-associate Simulink system**.

See Also
`report`

Related Examples

- "Select Report Generation Options" on page 4-4

Generate a Report

Generate a Report

In this section...
"Run a Report" on page 4-2
"Report Output Options" on page 4-2

Run a Report

You can generate a Simulink Report Generator report using one of these methods:

- In the Report Explorer Outline pane, select a report and do one of these actions:
  - In the Report Explorer toolbar, click the Report button ⚡.
  - Press **CTRL+R**.
  - Select **File** > **Report**.
- From the MATLAB command line, enter the `report` command. For example, to print the `system1_description` report in PDF format, enter:

  ```
  report system1_description -fpdf
  ```

Report Output Options

Before you generate a report, you can set options to control aspects of report generation processing such as:

- Output file format (HTML, Microsoft Word, or PDF)
- Stylesheet or templates for the selected output file format, to control the layout of the report
- Output file location
- Whether to view the report after it is generated

For details, see:

- "Report Output Format" on page 4-4
- "Location of Report Output File" on page 4-10
- "Create a Report Log File" on page 4-21

- “Report Description” on page 4-12
- “Change Report Locale” on page 4-17

Select Report Generation Options

In this section...

Report Options Dialog Box

To specify report generation options for a report, in the Report Explorer, use the Report Options dialog box. The Report Options dialog box appears when you select the report from the outline view.

To set the defaults for these options, use the Report Generator preferences. For details, see "Report Generation Preferences" on page 4-13.

Report Output Format

Under **Report Output Type and Style Sheets**, from the **File format** list, select the report output format. You can generate reports whose formatting is based on templates or based on Report Explorer stylesheets.

File Formats Using Report Templates

For faster report generation, set **File format** to use a template. Select one of these options:

- `Direct PDF (from template)`
- `HTML (from template)`

- `PDF (from Word template)`
- `Word (from template)`

If you select a `from template` output format, then you can use a default template or a customized template. For more information about using templates for report generation, see “Generate a Report Using a Template”. For information on customizing templates, see “Customize Report Conversion Templates”.

File Format Using Report Explorer Stylesheets

The output formats that do not include `from template` in the name use Report Explorer stylesheets for formatting. For those output formats, select a stylesheet from the **Stylesheet** list.

Viewer	Format	Description	Stylesheets
Adobe Acrobat Reader	Adobe Acrobat (PDF)	Produce a PDF that you can view using Adobe Acrobat Reader software. See “PDF: Image Formats” on page 4-6.	PDF (see “PDF Stylesheets”)
Word processor	`Word Document (RTF)` or `Rich Text Format`	Produce output that is compatible with most word-processing packages, including Microsoft Word software See “RTF: Display of Hidden Content” on page 4-6.	Print (see “RTF (DSSSL Print) and Word Stylesheets”)
DocBook	`DocBook (no transform)`	Produce a report in DocBook format	N/A

Tip To create and use customized styles, see “Create a New Stylesheet”.

PDF: Image Formats

PDF reports support only bitmap (`.bmp`), `JPEG` (`.jpg`), and Scalable Vector Graphics (`.svg`).

The SVG format is supported only for Simulink models and Stateflow charts. For example, MATLAB figures do not display in SVG when you select the SVG format for PDF reports.

RTF: Display of Hidden Content

RTF reports use placeholders (field codes) for dynamically generated content, such as page numbers or images.

On Windows® platforms, to display that content, press **Ctrl+A**, and then press **F9**.

On Linux® and Mac platforms, use the field code update interface for the program that you are using to view the RTF document.

Change the Default Output Format

In the Report Generator Preferences pane, use the **Format ID** preference to specify the default output format for reports.

Stylesheets

For each output format, you can choose from several stylesheets for each report output format. For details, see:

- "PDF Stylesheets" on page 4-7
- "Web Stylesheets" on page 4-7
- "RTF (DSSSL Print) and Word Stylesheets" on page 4-8

Note: Some Web and Print stylesheets include a generated list of titles, which includes table titles and figures with titles.

PDF Stylesheets

PDF Stylesheet	Description
`Default print stylesheet`	Displays title page, table of contents, list of titles
`Standard Print`	Displays title page, table of contents, list of titles
`Simple Print`	Suppresses title page, table of contents, list of titles
`Compact Simple Print`	Minimizes page count, suppresses title, table of contents, list of titles
`Large Type Print`	Uses 12-point font (slightly larger than Standard Print)
`Very Large Type Print`	Uses 24-point font and landscape paper orientation
`Compact Print`	Minimizes white space to reduce page count
`Unnumbered Chapters & Sections`	Uses unnumbered chapters and sections
`Numbered Chapters & Sections`	Numbers chapters and sections
`Paginated Sections`	Prints sections with page breaks
`Custom Header`	Lets you specify custom headers and footers
`Custom Titlepage`	Lets you specify custom title page content and presentation
`Verbose Print`	Lets you specify advanced print options

Web Stylesheets

Web Stylesheet	Description
`Default HTML stylesheet`	HTML on a single page
`Simulink book HTML stylesheet`	HTML on multiple pages; suppresses chapter headings and table of contents
`Truth Table HTML stylesheet`	HTML on multiple pages; suppresses chapter headings and table of contents
`Multi-page Web`	HTML, with each chapter on a separate page

Web Stylesheet	Description
`Single-page Web`	HTML on a single page
`Single-page Unnumbered Chapters & Sections`	HTML on a single page; chapters and sections are not numbered
`Single-page Numbered Chapters & Sections`	HTML on a single page; chapters and sections are numbered
`Single-page Simple`	HTML on a single page; suppresses title page and table of contents
`Multi-page Simple`	HTML on multiple pages; suppresses title page and table of contents
`Multi-page Unnumbered Chapters & Sections`	HTML on multiple pages; chapters and sections are not numbered
`Multi-page Numbered Chapters & Sections`	HTML on multiple pages; chapters and sections are numbered

RTF (DSSSL Print) and Word Stylesheets

RTF or Word Stylesheet	Description
`Standard Print`	Displays title page, table of contents, list of titles
`Simple Print`	Suppresses title page, table of contents, list of titles
`Compact Simple Print`	Minimizes page count, suppresses title, table of contents, list of titles
`Large Type Print`	Uses 12-point font (slightly larger than Standard Print)
`Very Large Type Print`	Uses 24-point font and landscape paper orientation
`Compact Print`	Minimizes white space to reduce page count
`Unnumbered Chapters & Sections`	Uses unnumbered chapters and sections
`Numbered Chapters & Sections`	Numbers chapters and sections

Report Generation Processing

The Report Options dialog box includes several options for controlling report processing.

Option	Purpose
View report after generation	When report generation finishes, the viewer associated with the report output format displays the report. **Note:** On Linux and Macintosh platforms, the report output displays in Apache OpenOffice™, which must be installed in `/Applications/OpenOffice.app`. To view the report manually, open the file from the location specified in the **Report Options** for the report, under **Report File Location**.
Auto save before generation	Automatically save the report setup file before you generate a report.

Option	Purpose
Compile model to report on compiled information	Ensure that a report reflects compiled values. By default, the Simulink Report Generator reports uncompiled values of Simulink parameters. The uncompiled values of some parameters, such as signal data types, can differ from the compiled values used during simulation. This option causes the report generator to compile a model before reporting on model parameters. After generating the report, the report generator returns the model to its uncompiled state. **Note:** When you select this option, whenever report generation requires simulating the model (for example, the report includes a Model Simulation component), the report generator uncompiles the model and then recompiles the model, if necessary, to report on model contents. If a report requires multiple compilations, the processing can be quite time-consuming. To minimize compilations, consider using separate reports to report on the contents of a model and on the results of simulating that model.
Evaluate this string after generation	Specify MATLAB code for processing to occur after the report is generated. For example, you could specify to close a model.

Location of Report Output File

Choose a folder to store the report file. You must have write privileges for that folder.

Folder

In the Report Explorer, in the Report Options dialog box, use the **Directory** field to specify the name of the folder in which to store the generated report file. Specify a folder to which you have write privileges.

The following table summarizes the report file location options.

Folder	Option
The same folder as the report setup file	`Same as setup file`
The current working folder	`Present working directory`
Temporary folder	`Temporary directory`
Another folder	`Custom`. Use the **Browse** button (...) to select from a list of directories.

You can use `%<VariableName>` notation to specify a folder in the **Custom** text box. For more information, see "%<VariableName> Notation" on the `Text` component reference page.

Report File Name

In the Report Explorer, in the Report Options dialog box, use the **Filename** field to specify a file name for the report file. Select one of the following options.

File Name	Option
The same file name as the report setup file	`Same as setup file` (default)
A file name different from the report setup file name	`Custom`. Enter the name of the report.

You can use `%<VariableName>` notation to specify a file name in the **Custom** text box. For more information, see "%<VariableName> Notation" on the `Text` component reference page.

Increment to Prevent Overwriting

To maintain the previous version of the setup file when you save updates to the setup file, select **If report already exists, increment to prevent overwriting**.

Image Output File Location

Images are placed in a folder with the same name as the report file. For example, `testreport.html` images are placed in a folder named `testreport_files`.

Report Description

To record notes and comments about your report setup, use the **Report Description** field. This text that you enter appears in the Properties pane when you select a report setup file in the Outline pane.

Report Generation Preferences

In this section...

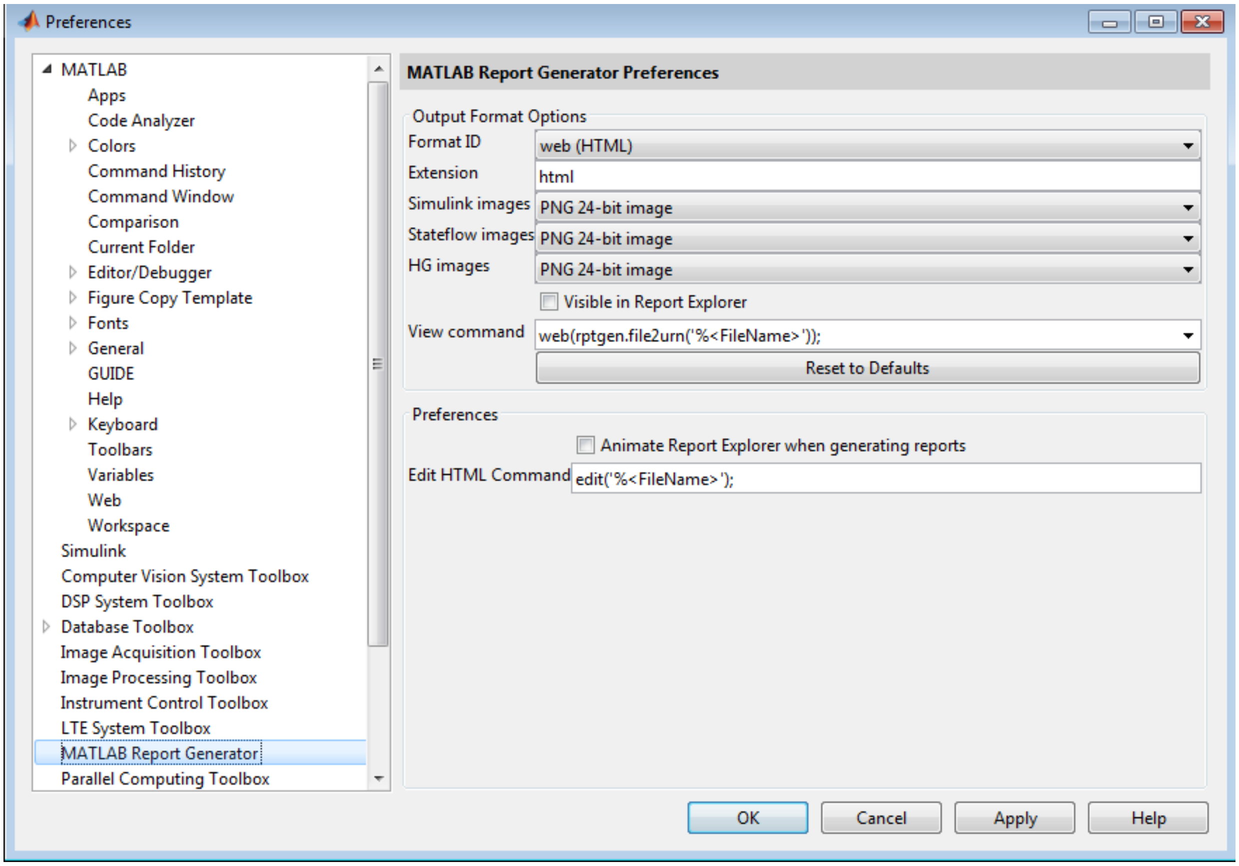
Report Generator Preferences Pane

To set defaults for report generation options, use the Report Generator Preferences pane. You can override these preferences with the Report Options dialog box or with individual components.

To specify report generation options for a specific report, in the Report Explorer, use the Report Options dialog box. For details, see "Select Report Generation Options" on page 4-4.

To open the Report Generator Preferences pane, use one of these approaches:

- In the Report Explorer, select **File** > **Preferences**.
- From the MATLAB Toolstrip, in the **Home** tab, in the **Environment** section, select **Preferences** > **Report Generator**.



MATLAB Report Generator Preferences

Output Format Options

Format ID: web (HTML)
Extension: html
Simulink images: PNG 24-bit image
Stateflow images: PNG 24-bit image
HG images: PNG 24-bit image
[ ] Visible in Report Explorer
View command: web(rptgen.file2urn('%<FileName>'));

Preferences

[ ] Animate Report Explorer when generating reports
Edit HTML Command: edit('%<FileName>');

File Format and Extension

To specify the default file format for reports, use the **Format ID** preference. The default preference is `web (HTML)`. You can select from a range of file formats, such as PDF, Microsoft Word, or LaTex.

Note: For reports that use the Word Document format, you must have Microsoft Word installed on the machine that you use to generate the report.

The **Extension** preference reflects the standard file extension for the file format specified with the **Format ID** preference. You can change the extension.

Image Formats

To set the default image formats associated with the output format for a report, use the following preferences.

Preference	Purpose
`Simulink Images`	Specify the format for Simulink images to include in the report.
`Stateflow Images`	Specify the format for Stateflow charts to include in the report.
`HG Images`	Specify the format for Handle Graphics images to include in the report.

Note: The default preferences for image formats should work in most viewing environments. However, some image formats do not display in some viewing environments.

Several components, such as the Figure Snapshot component, include an option for specifying the image format. The component setting overrides the image format preference.

Report Viewing

To control how you view a generated report, you can set the following preferences.

Preference	Purpose
`View command`	Specify the MATLAB command you want to use to view the report. Each file format has an associated default view command preference. You can modify the view command (for example, to support the use of a system browser).

Preference	Purpose
`Animate Report Explorer when generating reports`	Select this check box if you want components in the Outline pane to be animated as the report generates. This box is selected by default. To speed up the report generation processing, clear this preference.

Reset to Defaults

To reset the Report Generator preferences under **Output Format Options**, click **Reset to Defaults**. Resetting to defaults does not affect the options under **Preferences**.

Edit HTML Command

Enter the command to use to open HTML or PDF template files from the Report Explorer's Document Conversion Template Editor (see “Report Conversion Templates”). The default command opens the files in the MATLAB text editor.

To set this preference to an operating system command, use the MATLAB `system` command. Use the file name token `%<FileName>` to specify where in the command string the template editor inserts the path to the file to edit. Make sure that the command is on your system path.

This example shows a command that opens Report Generator HTML-based template files in the `notepad++` application. The ampersand character (&) executes the command in the background.

```
system('notepad++  %<FileName> &');
```

Change Report Locale

Versions 2.0 and later of the MATLAB Report Generator and Simulink Report Generator software use the locale (system language settings) through the Oracle® Java® interface; therefore, they should use the language specified on your system.

Alternatively, you can change the language directly in Java from the MATLAB command line. The following example sets the language to Italian:

```
java.util.Locale.setDefault(java.util.Locale.ITALY)
```

Alternatively, you can set the preferred language directly in your `.rpt` file:

1. Right-click the Report component and select **Send to Workspace**.

   This displays the properties of the report, which are stored in the variable *ans*. Access the report's `Language` property from the command line through this variable. By default, `Language` is `auto`, which indicates that the system's default language is in use.
2. Override the default value of `Language` by setting this property to your desired language; for example, `en` for English or `it` for Italian.

Convert XML Documents to Different File Formats

In this section...

Why Convert XML Documents?

You can generate a report in a different output file format without regenerating it by using either the Report Explorer File Converter or the `rptconvert` command. These utilities convert DocBook XML source files created by the report-generation process into formatted documents such as `HTML`, `RTF`, or `PDF`.

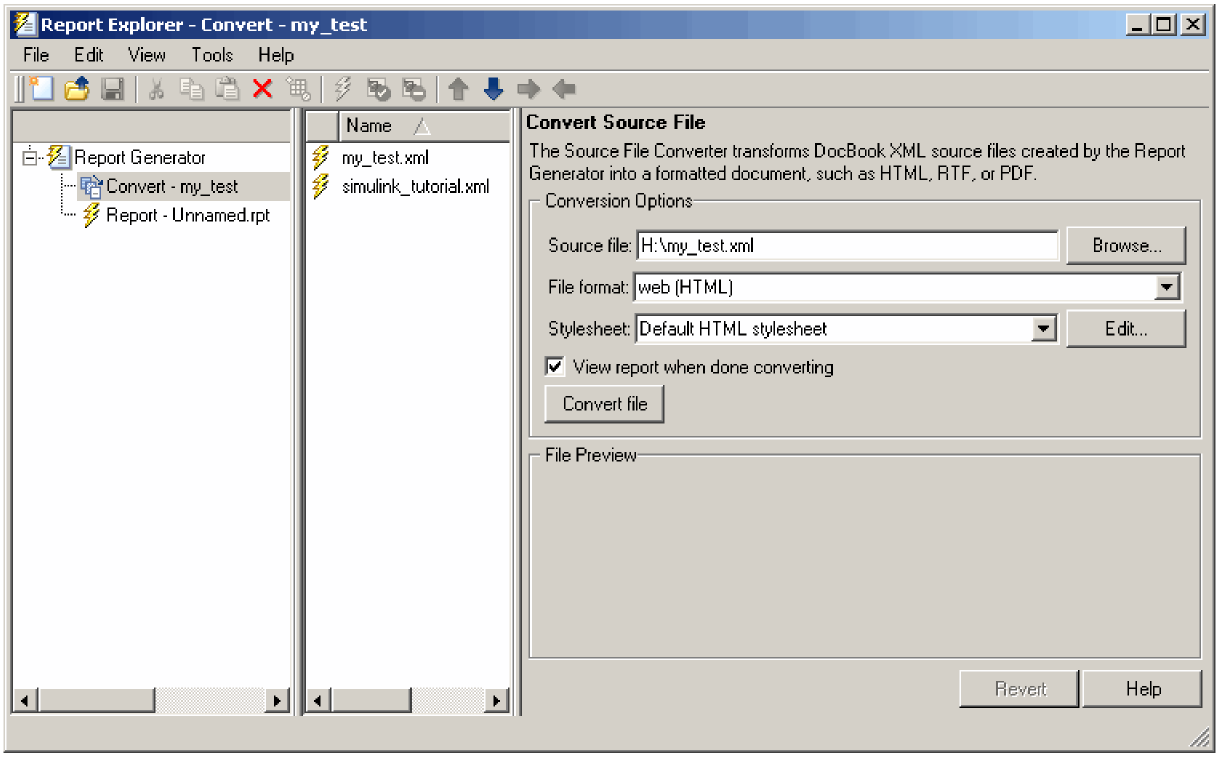
Note: The report-generation process can only convert XML source files created by the latest version of the software.

Convert XML Documents Using the Report Explorer

To open the **Convert** Properties pane:

1. In the Report Explorer, select **Tools** > **Convert source file**.

   The Convert Source File Properties pane appears. All XML files in your current folder appear in the Options pane in the middle.



Convert Source File

The Source File Converter transforms DocBook XML source files created by the Report Generator into a formatted document, such as HTML, RTF, or PDF.

Conversion Options

Source file: H:\my_test.xml

File format: web (HTML)

Stylesheet: Default HTML stylesheet

☑ View report when done converting

2 Select your XML source file using one of the following options:

- Click **Browse** in the Properties pane on the right to browse to the location of your XML source.
- Double-click a file name in the Options pane in the middle to automatically enter it into the **Source file** field in the Properties pane.

3 Select your output format and stylesheet:

a In the **File format** text box, select an output format.

b In the **Stylesheet** text box, select a stylesheet. The stylesheet choice depends on the specified output format. You can use a predefined or customized stylesheet.

For more information about available formats and predefined stylesheets, see “Report Output Format”.

For more information about customizing stylesheets, see “Create a New Stylesheet”.

4 Use the **View Report when done converting** check box to indicate whether you want to view the report after it has conversion.
5 To begin the conversion, click **Convert file**.

Convert XML Documents Using the Command Line

To convert files using the command line, use the rptconvertfunction.

Edit XML Source Files

Before you send a source file to the converter, edit it as text in the Report Explorer:

1 In the Outline pane on the left, open the File Converter.
2 Right-click **MATLAB Report Generator** and select **Convert source file**.
3 In the Options pane in the middle, select the source file to edit.
4 In the Properties pane on the right, click **Edit as text**.
5 Use the MATLAB Editor to edit and save the text.

Create a Report Log File

A log file describes the report setup file report-generation settings and components. A log file can be used for many purposes, including:

- As a debugger
- As a reference to a report setup file
- To share information about a report setup file through email

A log file includes the following information:

- Report setup file outline
- Components and their attributes
- Generation status messages currently displayed in the **Generation Status** tab

To generate a log file, click **File** > **Log File**. An HTML version of the log file with the name `<report_template_file_name_log>.html` is saved in the same folder as the report setup file.

Generate MATLAB Code from Report Setup File

You can generate MATLAB code versions of report setup files in the form of a MATLAB file (`*.m`). A MATLAB file of a report setup file is useful for various purposes, including generating reports and modifying report setup files programmatically.

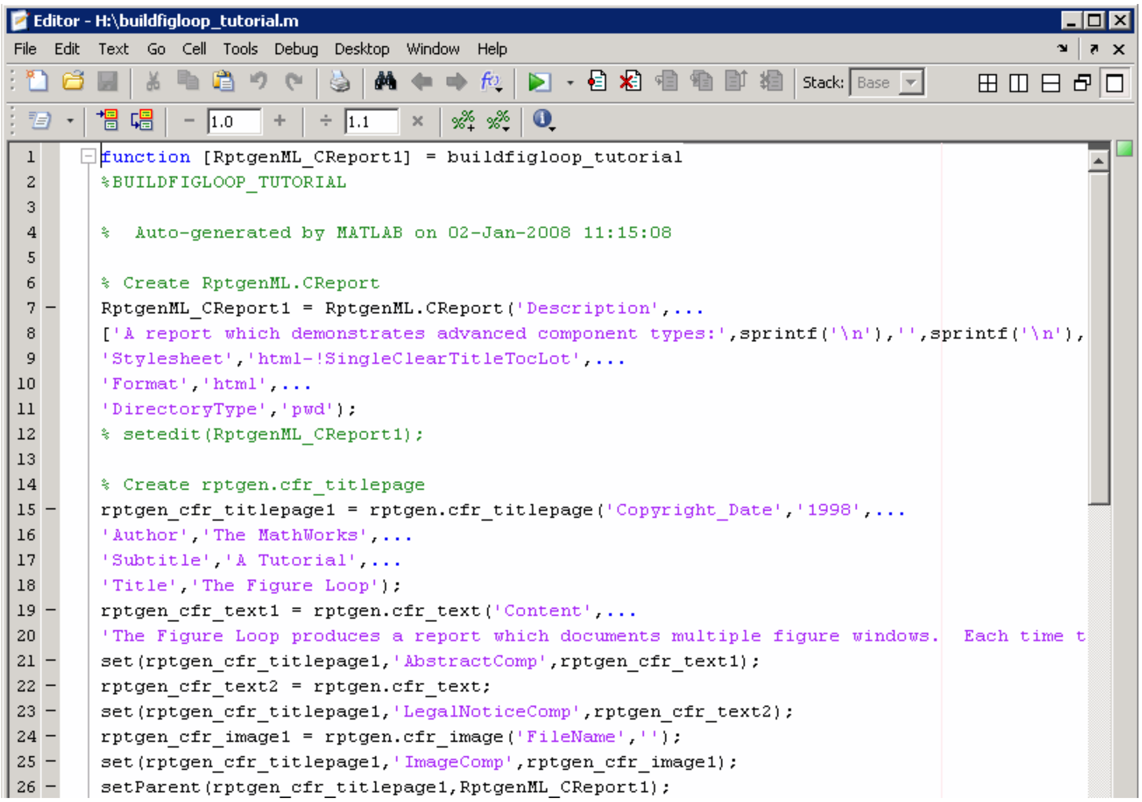
To generate a MATLAB file, load a report setup file into the Report Explorer and click **File** > **Generate MATLAB File**. After the MATLAB file generates, it opens in the MATLAB Editor. The filename for the generated file is the file name of the report setup file , preceded by "build."

Generate Reports from MATLAB Files

This example generates a MATLAB file from the `figloop_tutorial.rpt` report setup file, which is part of the MATLAB Report Generator software. The example then uses the `report` function to generate a report from the MATLAB file. For more information about this function, see the `report` reference page.

1 Start the Report Explorer by entering `report` in the MATLAB Command Window.
2 In the Options pane in the middle, double-click `figloop_tutorial.rpt` to open its report setup file.
3 In the Outline pane on the left, click `Report - figloop_tutorial.rpt` to select it.
4 In the Report Explorer menu bar, click **File** > **Generate MATLAB File**.

   The MATLAB Report Generator software generates MATLAB code for the `figloop_tutorial.rpt` report setup file. It saves this code in the `buildfigloop_tutorial.m` file in the folder you specify. Part of this file appears in the following figure.

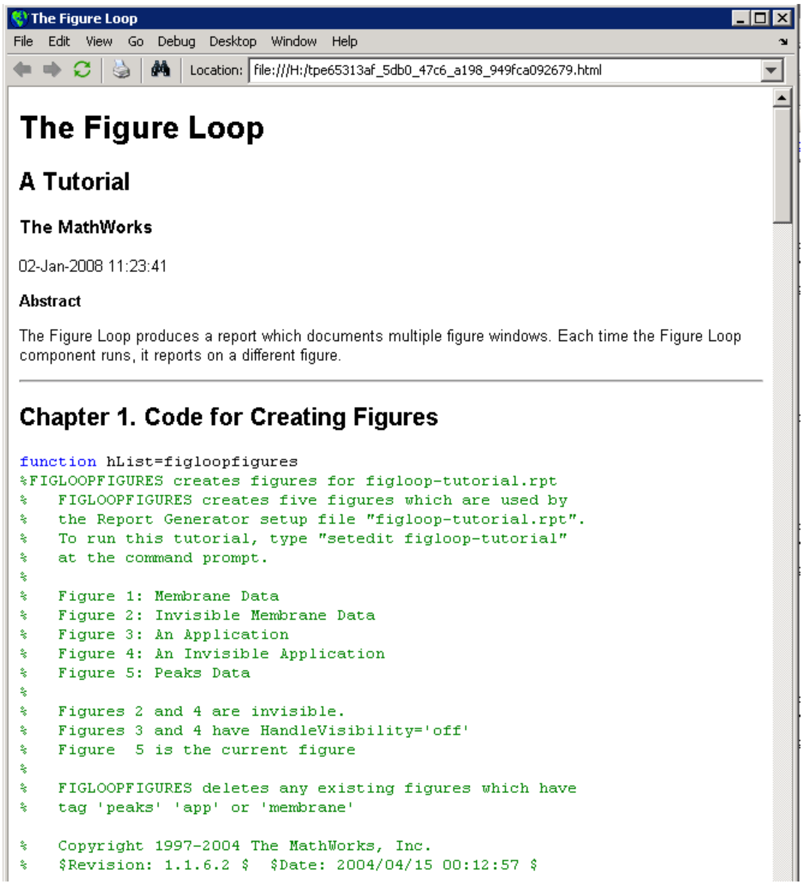

Editor - H:\buildfigloop_tutorial.m
File Edit Text Go Cell Tools Debug Desktop Window Help
Stack: Base
1.0
1.1

```
function [RptgenML_CReport1] = buildfigloop_tutorial
%BUILDFIGLOOP_TUTORIAL

%  Auto-generated by MATLAB on 02-Jan-2008 11:15:08

% Create RptgenML.CReport
RptgenML_CReport1 = RptgenML.CReport('Description',...
['A report which demonstrates advanced component types:',sprintf('\n'),'',sprintf('\n'),
'Stylesheet','html-!SingleClearTitleTocLot',...
'Format','html',...
'DirectoryType','pwd');
% setedit(RptgenML_CReport1);

% Create rptgen.cfr_titlepage
rptgen_cfr_titlepage1 = rptgen.cfr_titlepage('Copyright_Date','1998',...
'Author','The MathWorks',...
'Subtitle','A Tutorial',...
'Title','The Figure Loop');
rptgen_cfr_text1 = rptgen.cfr_text('Content',...
'The Figure Loop produces a report which documents multiple figure windows.  Each time t
set(rptgen_cfr_titlepage1,'AbstractComp',rptgen_cfr_text1);
rptgen_cfr_text2 = rptgen.cfr_text;
set(rptgen_cfr_titlepage1,'LegalNoticeComp',rptgen_cfr_text2);
rptgen_cfr_image1 = rptgen.cfr_image('FileName','');
set(rptgen_cfr_titlepage1,'ImageComp',rptgen_cfr_image1);
setParent(rptgen_cfr_titlepage1,RptgenML_CReport1);
```

5 To generate the `figloop_tutorial` report from this MATLAB file, run the following command in the MATLAB Command Window:

```
report(buildfigloop_tutorial);
```

The MATLAB Report Generator software runs and displays the report.


The Figure Loop
File Edit View Go Debug Desktop Window Help
Location: file:///H:/tpe65313af_5db0_47c6_a198_949fca092679.html

The Figure Loop

A Tutorial

The MathWorks

02-Jan-2008 11:23:41

Abstract

The Figure Loop produces a report which documents multiple figure windows. Each time the Figure Loop component runs, it reports on a different figure.

Chapter 1. Code for Creating Figures

```
function hList=figloopfigures
%FIGLOOPFIGURES creates figures for figloop-tutorial.rpt
%   FIGLOOPFIGURES creates five figures which are used by
%   the Report Generator setup file "figloop-tutorial.rpt".
%   To run this tutorial, type "setedit figloop-tutorial"
%   at the command prompt.
%
%   Figure 1: Membrane Data
%   Figure 2: Invisible Membrane Data
%   Figure 3: An Application
%   Figure 4: An Invisible Application
%   Figure 5: Peaks Data
%
%   Figures 2 and 4 are invisible.
%   Figures 3 and 4 have HandleVisibility='off'
%   Figure  5 is the current figure
%
%   FIGLOOPFIGURES deletes any existing figures which have
%   tag 'peaks' 'app' or 'membrane'

%   Copyright 1997-2004 The MathWorks, Inc.
%   $Revision: 1.1.6.2 $  $Date: 2004/04/15 00:12:57 $
```

Troubleshooting Report Generation Issues

In this section...
"Memory Usage" on page 4-25
"HTML Report Display on UNIX Systems" on page 4-26

Memory Usage

The Report Generator software has two converters for generating documents. One uses Java heap memory and the other does not.

To avoid Java heap memory issues, you can generate your report using the converter that does not use Java heap memory. To do so, under the **Report Options** for the report, set **File format** to one of the `(from template)` options, for example, `HTML (from template)`.

If you select one of the other options, you are using the converter that uses Java heap memory and you might have memory issues. By default, MATLAB sets a limit of 384 MB on the amount of memory the Oracle Java Virtual Machine (JVM™) software can allocate. The memory that the report generation process uses to build a document must fit within this limit. If you are having trouble processing large reports, you can try increasing the amount of memory that the software can allocate by:

- Running MATLAB without a desktop
- Increasing the memory allocation limit

Run MATLAB Without a Desktop

To run the MATLAB software without a desktop, start MATLAB using the `-nodesktop` option. In this case, you must generate the report from the command line using the `report` command.

Increase the MATLAB JVM Memory Allocation Limit

To increase the amount of JVM memory available by increasing the MATLAB JVM memory allocation limit, from the MATLAB Toolstrip, in the **Home** tab, in the **Environment** section, click **Preferences**. Use the **General > Java Heap Memory** pane to increase the memory.

HTML Report Display on UNIX Systems

HTML reports might not display in the Report Generator Web viewer on some UNIX® platforms. If this happens, configure the Report Generator software to launch an external browser.

1. In the Report Explorer, click **File** > **Preferences**.
2. Enter this command in the **View command** field, where *file name* is the name of your report setup file:

   ```
   web(rptgen.file2urn('%file name'), '-browser')
   ```

Export Simulink Models to Web Views

Web Views

What Is a Web View?

A Web view is an interactive rendition of a model that you can view in a Web browser. You can use Web views to navigate hierarchically to specific subsystems and see properties of blocks and signals. Web views provide a simple way to interactively explore a model. For example, you can view block parameter values without opening a block parameter dialog box.

Use Web views to share models with people who do not have Simulink installed.

You can save Web views of a model over time, creating snapshots of the model as it changes during the development process.

System Requirements

Although you use Simulink Report Generator software to create Web views. you can display a Web view in a browser, even if you do not have Simulink Report Generator installed.

By default, when you export a Web view, that Web view automatically displays in your default Web browser. Web views require a Web browser that supports SVG natively.

Web View Files

By default, exporting a Web view creates a zip file that includes the Web view HTML file, as well as files that support Web view display. Supporting files include files include `.svg` and `.png` files. Zip file packaging compresses the files and consolidates the Web view and supporting files into one zip file.

You can choose to export the Web view files as the Web view HTML file and the supporting files, in a folder, without being zipped. You can open the Web view HTML file directly, without having to open a non-zipped file. You can also choose to export the Web view files as both a zip file and as non-zipped files.

The default name of the zip file or folder that contains the non-zipped Web view files is the name of the model that contains the systems to export. You can specify a different file or folder name.

The default location for storing Web view files is the MATLAB current folder. You can choose a different folder.

If you send Web view files to someone else, consider whether you need to explain how to access the Web view file.

Related Examples

- “Export Models to Web View Files” on page 5-4
- “Display and Navigate a Web View” on page 5-6
- “Create and Use a Web View” on page 5-13

More About

- “Optional Web Views” on page 5-20

Export Models to Web View Files

In this section...
"Open the Web View Dialog Box" on page 5-4
"Export a Model to a Web View" on page 5-4

Open the Web View Dialog Box

To export a Web view, use the Web View dialog box. The way you access the dialog box differs, depending on whether you are using the Simulink Editor or the Report Explorer. You can also open the dialog box from the command line.

Interface	What You Do
Simulink Editor	Select **File** > **Export Model to** > **Web**.
Report Explorer	Select **Tools** > **Export Simulink to Web**.
Command line	Use the `slwebview` function without arguments.

Export a Model to a Web View

1. Open the model to export.
2. In the Simulink Editor, select **File** > **Export Model to** > **Web**.
3. In **Systems to Export**, select the levels of the model to export, in relationship to the system currently displayed or chart currently selected in the Simulink Editor.
4. For the systems in the levels that you are exporting, in **Include Options**, select any kinds of systems you want the Web viewer user to be able to navigate below the Subsystem or Model block, to the underlying blocks or models.

   If you select more than one kind of system, the criteria for exporting information for interacting with the contents of the systems are applied downward through the model hierarchy. For example, if you left **Referenced Models** unchecked when you exported the model, regardless of how you set the **Library Links** option, in the Web view you cannot interact with a library link block that is inside of a referenced model.
5. In the **Systems to Exclude** list of the systems you have selected to export, select any systems that you do not want to export. To select multiple systems, press the **Ctrl** key and select systems.

6. To avoid overwriting existing exported Web view files, select **If file exists, increment name to prevent overwriting**.
7. In **Package Type**, specify whether you want to package the Web view as a zipped file (the default packaging). In **Package name**, you can specify a name for the zip file or for the folder for the Web view files.
8. Click **Export**.

Note: If you use the Web View export option in the Report Explorer Properties pane, then click **Export model**. If you change the visible system or chart while the Report Explorer **Web View** pane is visible, the pane does not automatically change to show information about the newly visible system. To update the **Web View** pane, click **Refresh**.

---

9. If you have Simulink Verification and Validation installed, you can use the **Optional Views** tab to select **Model Coverage** or **Requirements**, or both, to export the associated kind of information.

See Also

Functions

`slwebview`

Related Examples

- "Display and Navigate a Web View" on page 5-6
- "Create and Use a Web View" on page 5-13

More About

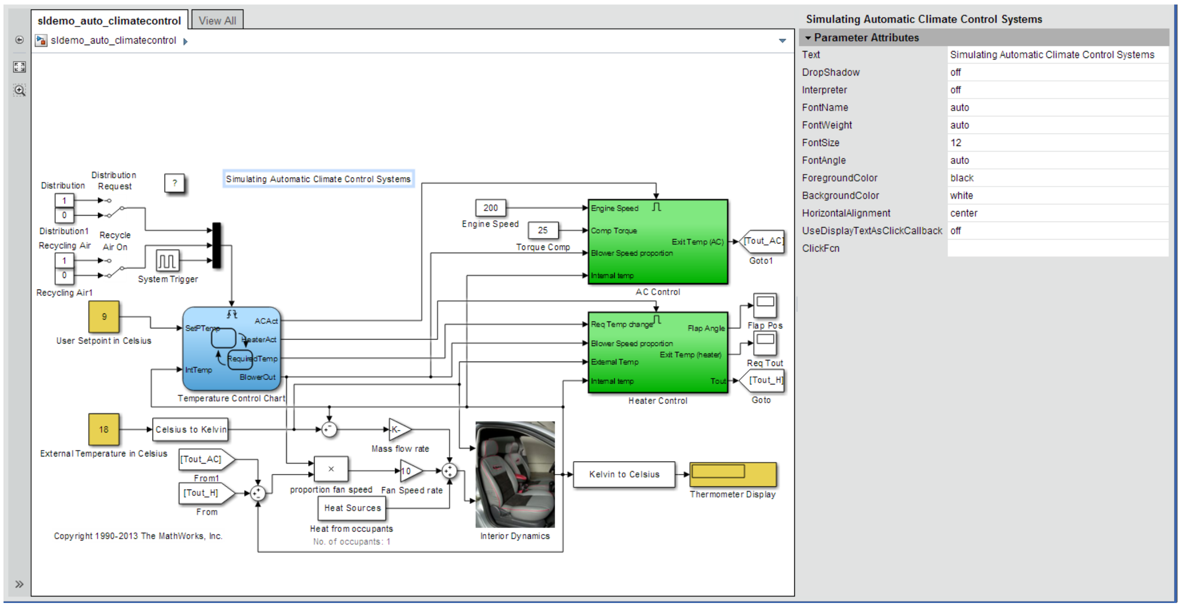
- "Web Views" on page 5-2
- "Web View Files" on page 5-2
- "Optional Web Views" on page 5-20

Display and Navigate a Web View

In this section...

Display a Web View When You Export It

When you export a Web view using the Web View dialog box or from the Report Explorer **Web View** pane, the Web view appears in your system Web browser.



Simulating Automatic Climate Control Systems

Parameter Attributes

Text	Simulating Automatic Climate Control Systems
DropShadow	off
Interpreter	off
FontName	auto
FontWeight	auto
FontSize	12
FontAngle	auto
ForegroundColor	black
BackgroundColor	white
HorizontalAlignment	center
UseDisplayTextAsClickCallback	off
ClickFcn	

Open a Web View File in a Web Browser

To open a Web view file to display in a Web browser, from the folder that contains the Web view files, select the HTML file.

Open the `webview.html` file to display the Web view. For details about file packaging and location, see "Web View Files" on page 5-2.

To use a Google® Chrome Browser, you need to do some setup.

Open a Web View in a Google Chrome Browser on a Windows Platform

1. If you do not already have a shortcut set up for Google Chrome, click the Windows **Start** button and search for `Chrome`.
2. Right-click and drag the Google Chrome icon to an open area on your desktop.
3. Right-click the icon and select **Create shortcut**.
4. Right-click the shortcut and select **Properties**.
5. In the **Target** edit box, append the following text: `--allow-file-access-from-files`. Be sure to use two hyphens at the beginning. Click **OK**.
6. Close all open Google Chrome browsers.
7. Use the shortcut to open a Google Chrome browser.
8. Open the Web view file.

Open a Web View in a Google Chrome Browser on a Macintosh Platform

1. Run **Terminal**. You can find it using **Spotlight**, in `Applications/Utilities`.
2. Enter the following text:

```
open/Applications Google\Chrome.app --allow-file-access-from-files
```

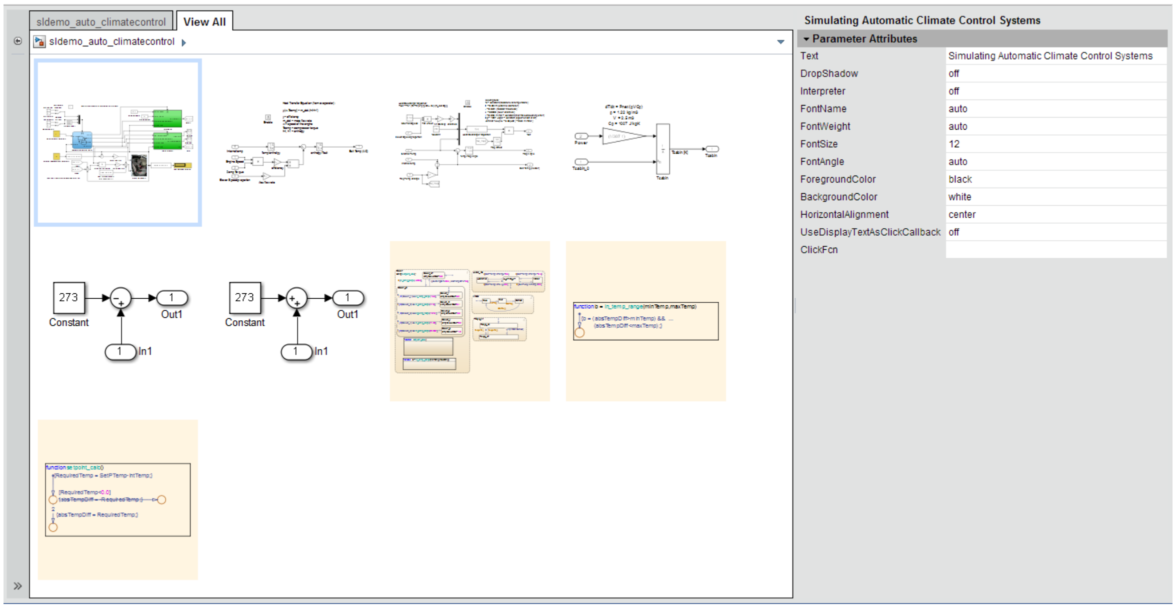
Open a Web View in a Google Chrome Browser on a Linux Platform

1. Run **terminal**.
2. Enter the following text:

```
./chromium-browser --allow-file-access-from-files
```

View Contents of a System

To see a thumbnail of the contents of all of systems in the Web view, click the **View All** tab.



Simulating Automatic Climate Control Systems

▾ Parameter Attributes

Text	Simulating Automatic Climate Control Systems
DropShadow	off
Interpreter	off
FontName	auto
FontWeight	auto
FontSize	12
FontAngle	auto
ForegroundColor	black
BackgroundColor	white
HorizontalAlignment	center
UseDisplayTextAsClickCallback	off
ClickFcn	

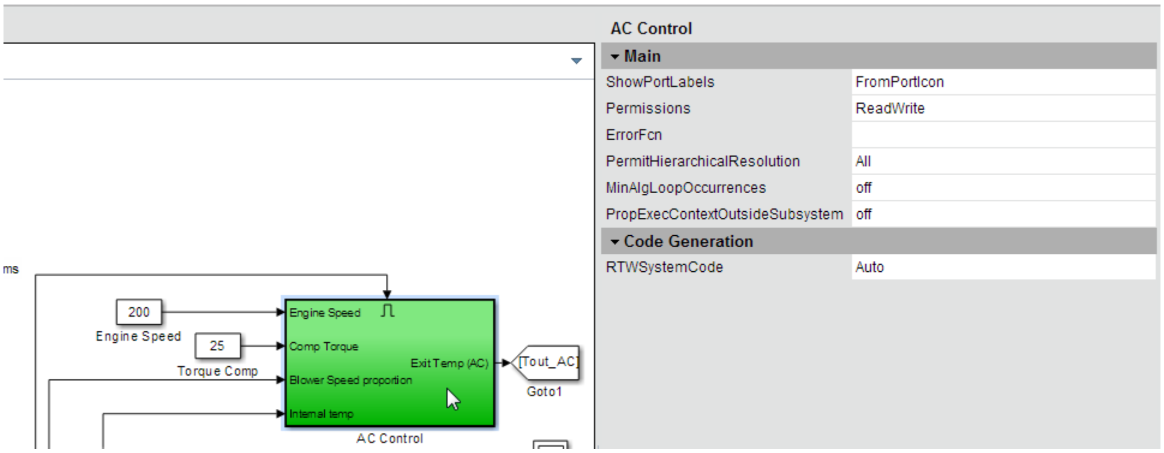
To view the contents of a specific system, use one of these approaches:

- In the model viewer, double-click the system.
- In the model browser, select a system. To expose this pane, click **Hide/Show Model Browser** ».
- Click the **View All** tab and click the thumbnail of a system.

To open a system in a separate tab, press **CTRL** and click the system.

View Block Parameters and Signal Properties

Click a block or signal in the model to see its parameters or properties in the **Object Inspector** pane.



AC Control

Main

ShowPortLabels	FromPortIcon
Permissions	ReadWrite
ErrorFcn	
PermitHierarchicalResolution	All
MinAlgLoopOccurrences	off
PropExecContextOutsideSubsystem	off

Code Generation

RTWSystemCode	Auto

Access Optional Web View Information

To view the model coverage or requirements optional Web view information in a Web view, you must have Simulink Verification and Validation installed. To access the information, click a highlighted block (for example, blocks with an orange border have requirements information). The information for that block appears in the **Informer** pane below the model.

See Also

Functions

`slwebview`

Related Examples

- “Create and Use a Web View” on page 5-13

More About

- “Web Views” on page 5-2
- “Web View Files” on page 5-2
- “Optional Web Views” on page 5-20

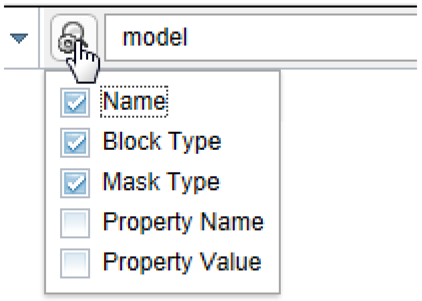
Search a Web View

In this section...
"Perform a Search" on page 5-10
"Sort Search Results" on page 5-12
"Navigate Between Search Results and Model Elements" on page 5-12

Perform a Search

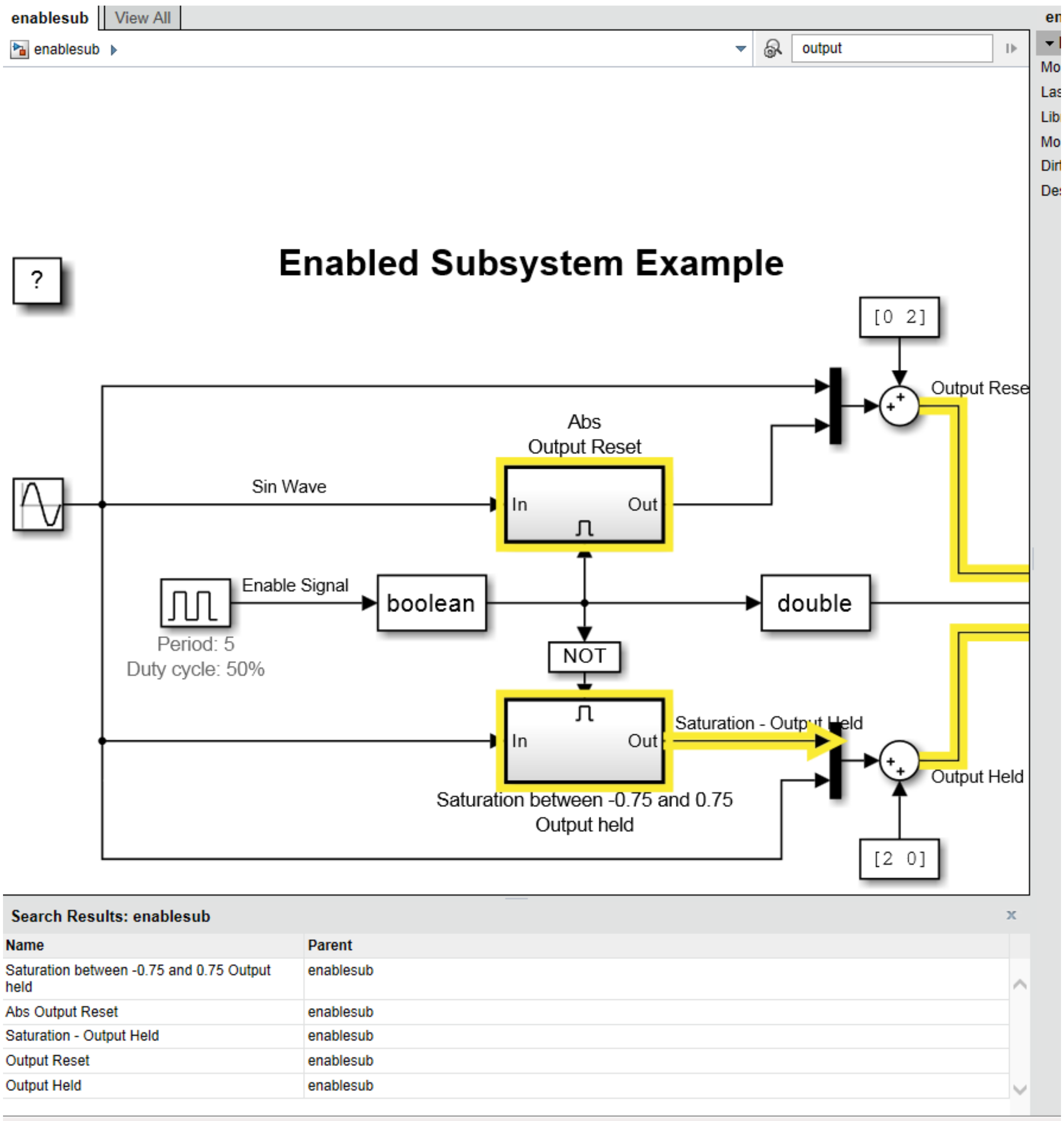
1 In a Web View, at the top of the displayed tab, click the search button 🔍.
2 In the search box, enter the search term.

   Search strings are case-insensitive. The search treats the string as a partial string.
3 To specify search criteria, click the search criteria button and select the types of model element you want to search in.



4 Press **Enter**.

The elements of the model that the search returns appear highlighted. The search results include the name and parent for each returned element.



Search Results: enablesub

Name	Parent
Saturation between -0.75 and 0.75 Output held	enablesub
Abs Output Reset	enablesub
Saturation - Output Held	enablesub
Output Reset	enablesub
Output Held	enablesub

Sort Search Results

You can sort the search results in alphabetical order. In the search results table, click the **Name** or **Parent** column.

Navigate Between Search Results and Model Elements

To see the corresponding search result for a highlighted model element, click the element.

To highlight the model element for a search result, click the search result.

The **Object Inspector** pane to the right of the model updates to reflect the selected model element or search result.

Create and Use a Web View

In this section...

About This Tutorial

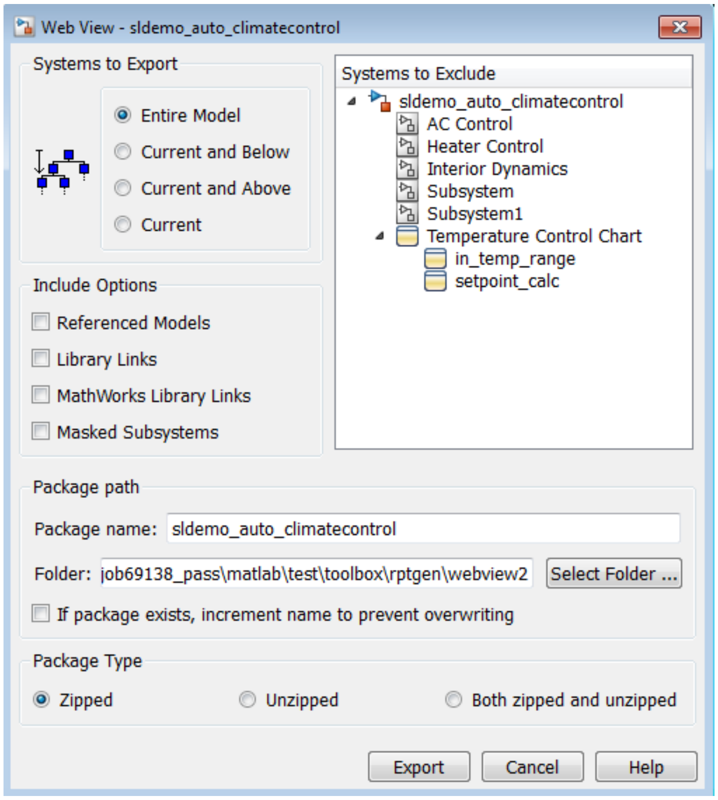
This tutorial takes you through the steps to export a Simulink model to a Web view.

You create a Web view from the Simulink model window using the `sldemo_auto_climatecontrol` model, which is provided with the Simulink software. This model simulates the working of an automatic climate control system in a car.

Export Specific Systems

When you create the Web view, you can specify export options.

1. At the MATLAB command prompt, enter `sldemo_auto_climatecontrol` to open the Simulink model.
2. In the Simulink Editor, select **File** > **Export Model to** > **Web**.


Web View - sldemo_auto_climatecontrol

Systems to Export
- (●) Entire Model
- ( ) Current and Below
- ( ) Current and Above
- ( ) Current

Include Options
- [ ] Referenced Models
- [ ] Library Links
- [ ] MathWorks Library Links
- [ ] Masked Subsystems

Systems to Exclude
- sldemo_auto_climatecontrol
  - AC Control
  - Heater Control
  - Interior Dynamics
  - Subsystem
  - Subsystem1
  - Temperature Control Chart
    - in_temp_range
    - setpoint_calc

Package path

Package name: sldemo_auto_climatecontrol

Folder: job69138_pass\matlab\test\toolbox\rptgen\webview2

- [ ] If package exists, increment name to prevent overwriting

Package Type
- (●) Zipped
- ( ) Unzipped
- ( ) Both zipped and unzipped

3 In the **Include Options**, select **Masked Subsystems**. This enables users of the Web view to interact with masked blocks.

4 In **Systems to Exclude**, select `Temperature Control Chart`.

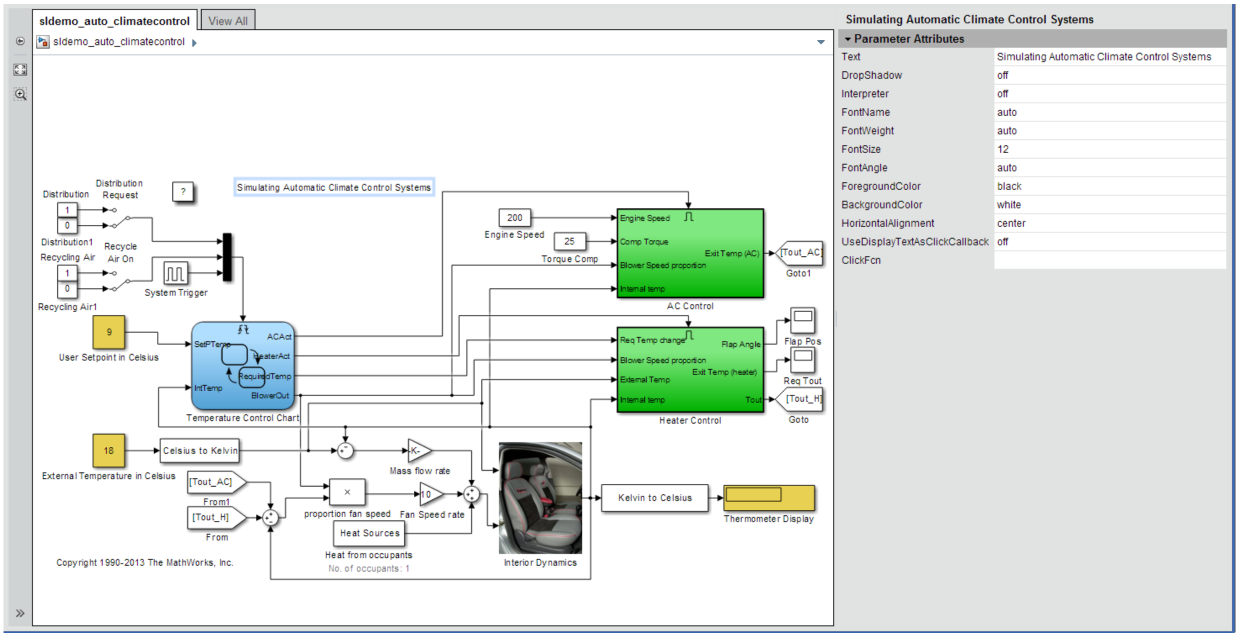
5 Use the **Folder** edit box to specify `climate_control_webview` as the name for the zip file for the exported Web view files.

6 Select the **If file exists, increment name to prevent overwriting** check box. Selecting this option prevents overwriting the Web view files if you export multiple Web views from the same model.

7 Click **Export**.

Exporting the selected systems to a Web view creates several support files, as well as an HTML file for displaying the systems. In this example, you change the defaults for the naming of the files.

The Web view files are exported, and the Web view appears in a Web browser.



Simulating Automatic Climate Control Systems

Parameter Attributes

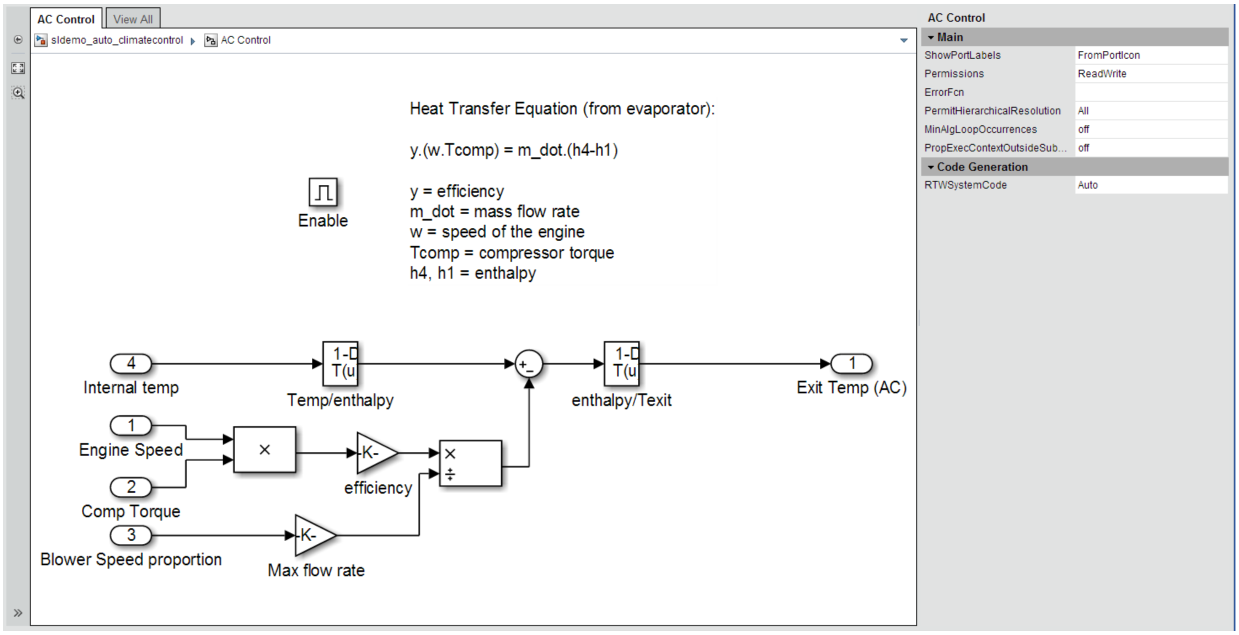
Text	Simulating Automatic Climate Control Systems
DropShadow	off
Interpreter	off
FontName	auto
FontWeight	auto
FontSize	12
FontAngle	auto
ForegroundColor	black
BackgroundColor	white
HorizontalAlignment	center
UseDisplayTextAsClickCallback	off
ClickFcn	

The Temperature Control Chart appears in the top level of the model, but you cannot open that chart in the Web view to see its contents.

Navigate the Web View

By default, if you export a whole model to a Web view, the **Model Viewer** pane shows the whole model. You can display specific systems in the Web view. For example:

1 In the model viewer, double-click the AC Control subsystem.



Heat Transfer Equation (from evaporator):

y.(w.Tcomp) = m_dot.(h4-h1)

y = efficiency
m_dot = mass flow rate
w = speed of the engine
Tcomp = compressor torque
h4, h1 = enthalpy

AC Control

Main	
ShowPortLabels	FromPortIcon
Permissions	ReadWrite
ErrorFcn	
PermitHierarchicalResolution	All
MinAlgLoopOccurrences	off
PropExecContextOutsideSub...	off
Code Generation	
RTWSystemCode	Auto

The AC Control subsystem appears in the model viewer. The tab label reflects the name of the currently displayed subsystem.

2 Open the model browser (hidden by default). Click **Hide/Show Model Browser** ».

3 Open another system, in a separate tab. In the model browser, **CTRL+click** select the Heater Control system.

4 Drag the AC Control system to the top of model viewer. Place the cursor in the display area, hold down the mouse scroll wheel, and drag.

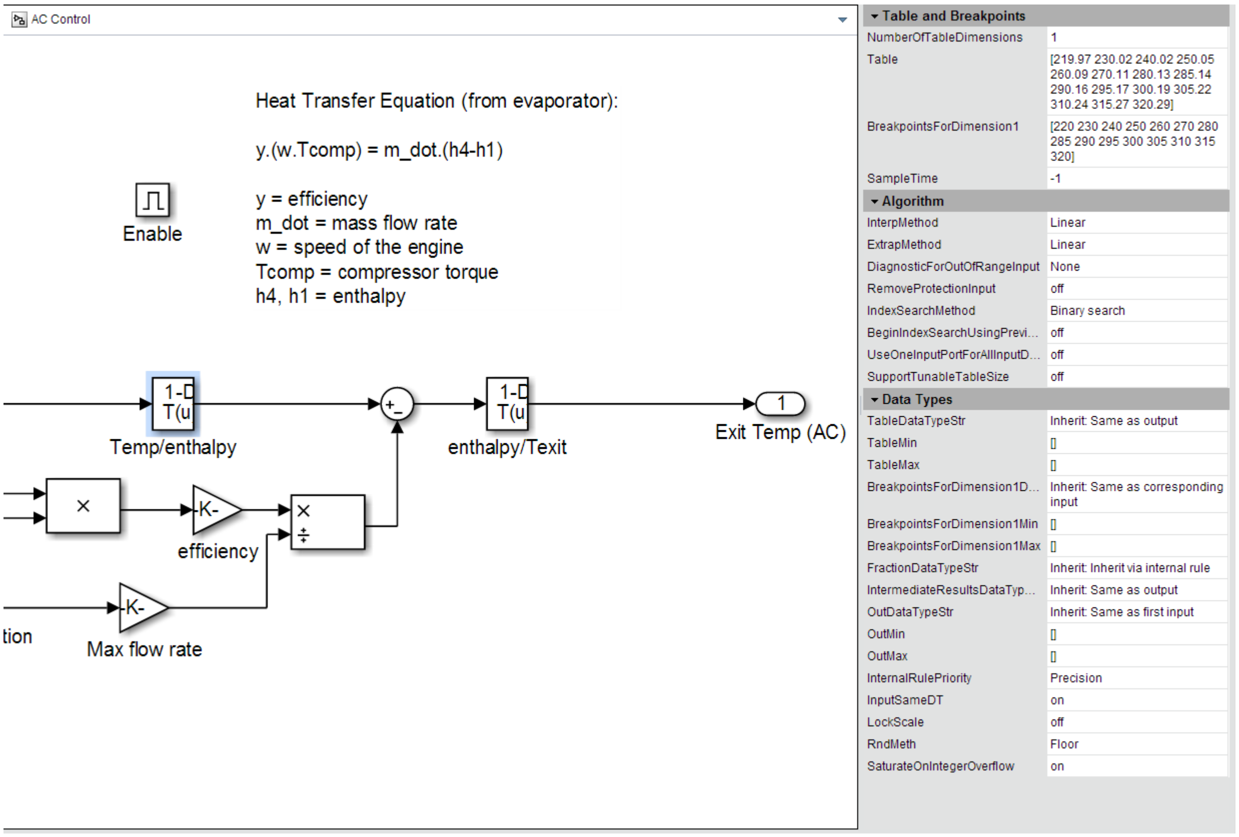
5 Zoom the display with the mouse scroll wheel.

Display Parameters and Properties of Blocks and Signals

1 In the model browser, select `sldemo_auto_climatecontrol`.

2 Double-click the AC Control subsystem.

3 Click the Temp/enthalpy block to view the block parameter values. The **Object Inspector** pane groups the block parameters by the block parameter dialog box tabs.



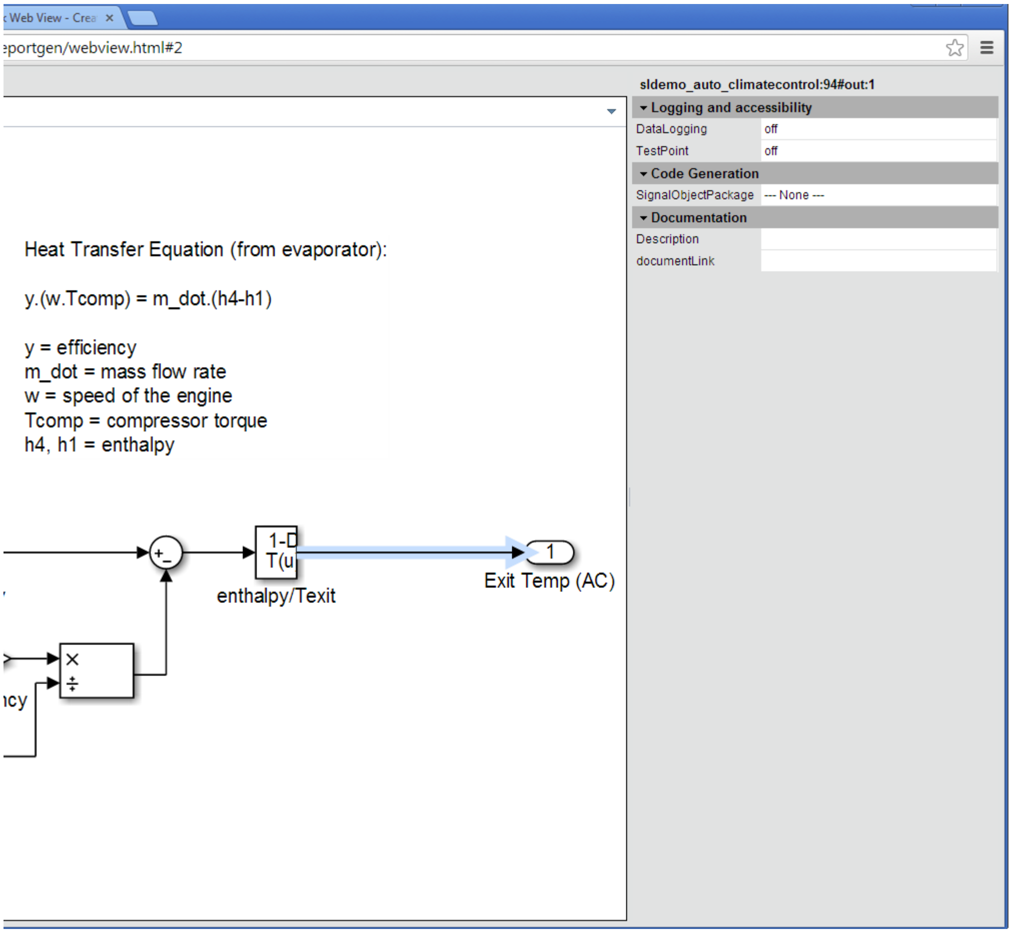
Heat Transfer Equation (from evaporator):

y.(w.Tcomp) = m_dot.(h4-h1)

y = efficiency
m_dot = mass flow rate
w = speed of the engine
Tcomp = compressor torque
h4, h1 = enthalpy

Table and Breakpoints	
NumberOfTableDimensions	1
Table	[219.97 230.02 240.02 250.05 260.09 270.11 280.13 285.14 290.16 295.17 300.19 305.22 310.24 315.27 320.29]
BreakpointsForDimension1	[220 230 240 250 260 270 280 285 290 295 300 305 310 315 320]
SampleTime	-1
Algorithm	
InterpMethod	Linear
ExtrapMethod	Linear
DiagnosticForOutOfRangeInput	None
RemoveProtectionInput	off
IndexSearchMethod	Binary search
BeginIndexSearchUsingPrevi...	off
UseOneInputPortForAllInputD...	off
SupportTunableTableSize	off
Data Types	
TableDataTypeStr	Inherit: Same as output
TableMin	[]
TableMax	[]
BreakpointsForDimension1D...	Inherit: Same as corresponding input
BreakpointsForDimension1Min	[]
BreakpointsForDimension1Max	[]
FractionDataTypeStr	Inherit: Inherit via internal rule
IntermediateResultsDataTyp...	Inherit: Same as output
OutDataTypeStr	Inherit: Same as first input
OutMin	[]
OutMax	[]
InternalRulePriority	Precision
InputSameDT	on
LockScale	off
RndMeth	Floor
SaturateOnIntegerOverflow	on

4 Click the input signal for the Exit Temp (AC) block to display the signal properties.



sldemo_auto_climatecontrol:94#out:1

Logging and accessibility

DataLogging	off
TestPoint	off

Code Generation

SignalObjectPackage	--- None ---

Documentation

Description	
documentLink	

Heat Transfer Equation (from evaporator):

y.(w.Tcomp) = m_dot.(h4-h1)

y = efficiency
m_dot = mass flow rate
w = speed of the engine
Tcomp = compressor torque
h4, h1 = enthalpy

Try navigating to other parts of the Web view.

5 Close the Web view.

Open the Web View

In the MATLAB current folder (or wherever you saved the zip file when you performed the steps in “Export Specific Systems” on page 5-13), extract the `climate_control_webview` zip file contents and open the `webview.html` file.

Related Examples

- “Export Models to Web View Files” on page 5-4
- “Display and Navigate a Web View” on page 5-6

More About

- “Web Views” on page 5-2

Optional Web Views

Optional Web views provide information about a model in addition to the standard Web view information about blocks and signals in a model.

The Simulink Report Generator includes the following optional Web views that you can capture and view if you have Simulink Verification and Validation installed:

- Requirements
- Model coverage

These optional views display requirements or model coverage information associated with the current Web view.

To include model coverage information in a Web view, set up a coverage report for the model and simulate the model before selecting the model coverage optional view option.

Related Examples

- “Capture and View Optional Web View Information” on page 5-21
- “Export Models to Web View Files” on page 5-4

More About

- “Optional Web Views” on page 5-20

Capture and View Optional Web View Information

Capture Optional Web View Information for a Model

When you create a Web view, you can include optional Web view information.

To add the model coverage or requirements optional view information to a Web view for a model, you must have Simulink Verification and Validation installed.

1 In the Web View dialog box, open the **Optional Views** tab.
2 Select each optional view (for example, **Model Coverage** or **Requirements**) that you want to capture the associated information for.

Tip The **Optional Views** tab appears only if you can access an optional Web view.

Alternatively, in the Simulink Editor, click **Analysis** > **Requirements Traceability** > **Generate Web View**.

View Optional Web View Information

To view the model coverage or requirements optional Web view information in a Web view, you must have Simulink Verification and Validation installed.

In a Web view, click a highlighted block (for example, blocks with an orange border have requirements information). The information for that block appears in the **Informer** pane below the model.

Related Examples

- "Export Models to Web View Files" on page 5-4

More About

- "Optional Web Views" on page 5-20

Add Content with Components

Components

Components are MATLAB objects that specify the content of a report. Add components to specify the types of content that commonly occur in reports. The MATLAB Report Generator provides a set of components for specifying the types of content that commonly occur in MATLAB-based reports. The Simulink Report Generator provides additional components to facilitate generation of reports from Simulink models. You can also create custom components to handle content specific to your application.

Using the Report Explorer, you can interactively combine components to create a report setup that specifies the content of a particular report or type of report. For general information about working with components, see:

- “Insert Components”
- “Set Component Properties”

Use a combination of the following types of components in your report setup file, based on your goals for the report.

Type of Component	Description
“Report Structure Components” on page 6-4	Include a title page, chapters, sections, paragraphs, lists, tables, and other standard document structure elements.
“Table Formatting Components” on page 6-5	Organize generated content into tables.
“Property Table Components” on page 6-6	Display tables with property name/ property value pairs for objects.
“Summary Table Components” on page 6-17	Display tables with specified properties for objects.
“Logical and Looping Components” on page 6-21	Run child components a specified number of times. There are several looping components, including logical loops and Handle Graphics loops.

Component Formatting

When you generate a report, in the Report Options dialog box, in the File format field you specify the type of report output you want. For example, you can generate a report in PDF, HTML, or Microsoft Word format.

For each format, you can choose to apply styles from either of these style definition sources:

- An HTML or Word report conversion template
- A Model Explorer stylesheet for HTML, Word, or PDF.

The output format and the associated template or stylesheet that you select for a report determines most aspects of the formatting of the generated report. For example, a report template or stylesheet typically uses different font sizes for chapter titles and section titles. For details, see "Report Output Format".

Several components include properties that you can set to specify formatting details for that specific instance of a component. For example, for the `MATLAB Property Table`, you can specify formatting such as whether to display table borders or the alignment of text in table cells.

Report Structure Components

Use report structure components to organize the content of your report into chapters, sections, paragraphs, lists, tables, and other standard document structure elements. The following table summarizes the report structure components.

Component	Usage
Title Page	Generate a title page for a report.
Chapter/Subsection	Parent components that generate the content of a chapter or chapter subsection.
Paragraph	Specify the content and text format of a paragraph of text. Can serve as the parent of one or more text components, enabling use of multiple text formats (for example, bold, regular, or italic) in the same paragraph.
Text	Format strings of generated text.
List	Generate a list from a cell array of numbers or strings or parent components (for example, Paragraph components) that specify the items in a list. You can create multilevel lists by embedding list components within list components.
Link	Generate a hyperlink from one location in a report to another or to an external location on the user's file system or the Worldwide Web.
Image	Insert an image into a report.
Array-Based Table	Generate a table from a cell array of numbers or strings.
Table	Parent a table body component. See "Table Formatting Components".

Table Formatting Components

Use table formatting components to organize generated content into tables. The following table summarizes the table formatting components.

Component	Usage
Table	Parent a table body component. Can also parent column specification components and a table header and a table footer component. Specifies properties of the table as a whole (for example, its title, number of columns, and border).
Table Body	Parent the rows that make up the table body. Specifies the default vertical alignment of entries in a table body.
Table Column Specification	Specify attributes of a table column, such as its width and borders and the default horizontal alignment of column entries.
Table Entry	Parent a component that determines a table entry’s content, such as a paragraph, image, list, or another table component. Specifies attributes of a table entry, such as the number of rows and columns that it spans.
Table Footer	Parent the row components that generate the content of a table footer.
Table Header	Parent the row components that generate the content of a table header.
Table Row	Parent the table entry components that generate the content of a table row.

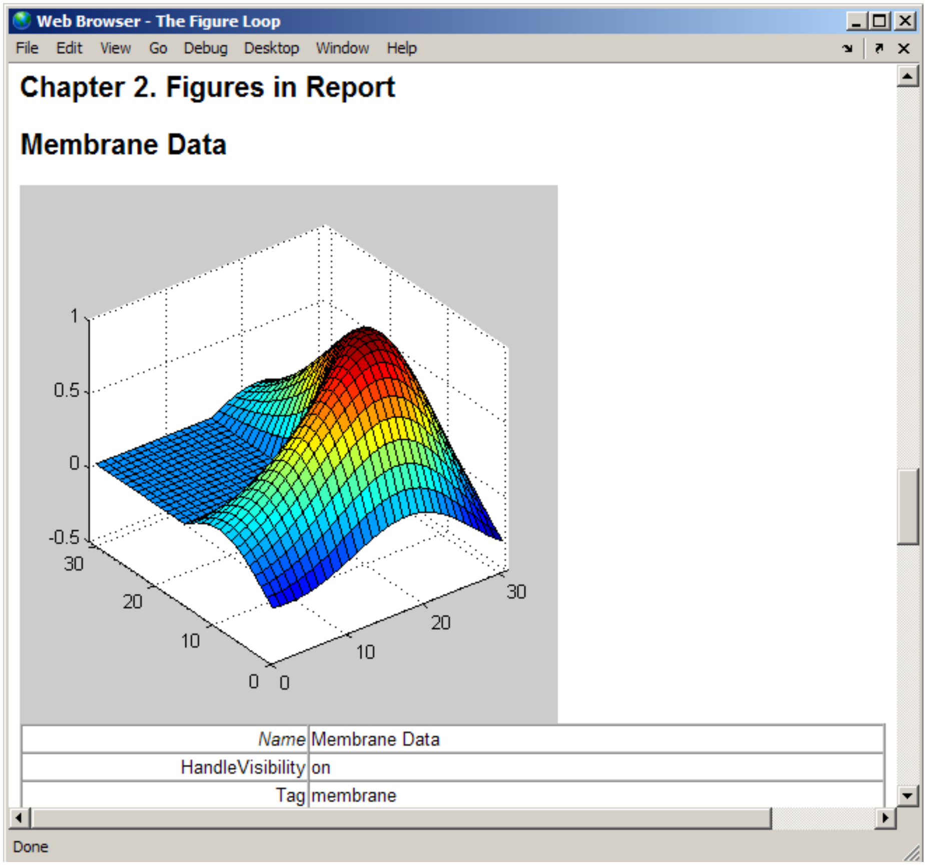
Tip Inserting a Table component into a setup also inserts all the descendant components required to generate a 2x2 table, creating a table template. Edit this template to create a table that suits your needs.

Property Table Components

In this section...

About Property Table Components

Property Table components display property name/property value pairs for objects in tables. The following example shows a property table from the `figloop-tutorial` report.


Web Browser - The Figure Loop
File Edit View Go Debug Desktop Window Help
Done

Chapter 2. Figures in Report

Membrane Data

1
0.5
0
-0.5
30
20
10
0
0
10
20
30

Name	Membrane Data
HandleVisibility	on
Tag	membrane

Many types of property table components are available, including:

- MATLAB Property Table
- Simulink Property Table (requires Simulink Report Generator)
- Stateflow Property Table (requires Simulink Report Generator)

The component used in this example represents MATLAB Report Generator property table components, all of which exhibit similar behavior.

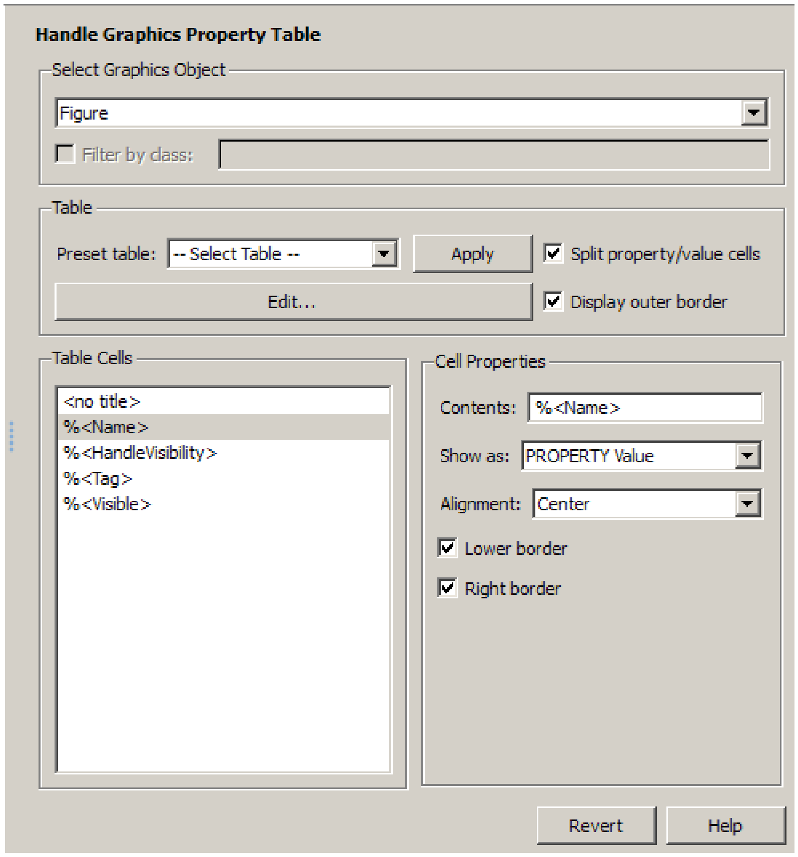
Open the Example Report Template

This example uses the `figloop-tutorial` report template. To open the figure loop tutorial report template, at the MATLAB command line enter:

```
setedit figloop-tutorial
```

Examine the Property Table Output

Property pages for all property table components are similar in form. In the Outline pane, select the `Figure Prop Table` component. To modify table settings, in the Handle Graphics Property Table dialog box, click the **Edit...** button.



Handle Graphics Property Table

Select Graphics Object: Figure

Filter by class: [ ]

Table

Preset table: -- Select Table --

Split property/value cells: ✓

Display outer border: ✓

Table Cells:

<no title>
%<Name>
%<HandleVisibility>
%<Tag>
%<Visible>

Cell Properties

Contents: %<Name>

Show as: PROPERTY Value

Alignment: Center

Lower border: ✓

Right border: ✓

Select Object Types

Property table components offer multiple object types on which to report. For example, the Handle Graphics Property Table lets you report on a figure, an axes object, or a Handle Graphics object.

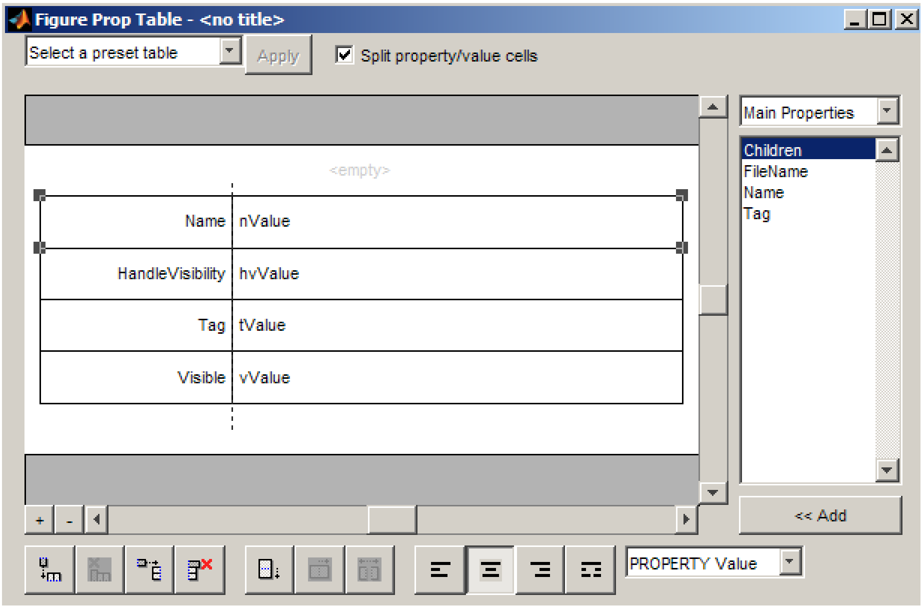
You can select a different object type on which to report in the **Object type** list in the Properties pane for the component.

Display Property Name/Property Value Pairs

Split Property/Value Cells

1 In the Properties pane for the Handle Graphics Property Table component, clear the **Split property/value cells** check box.

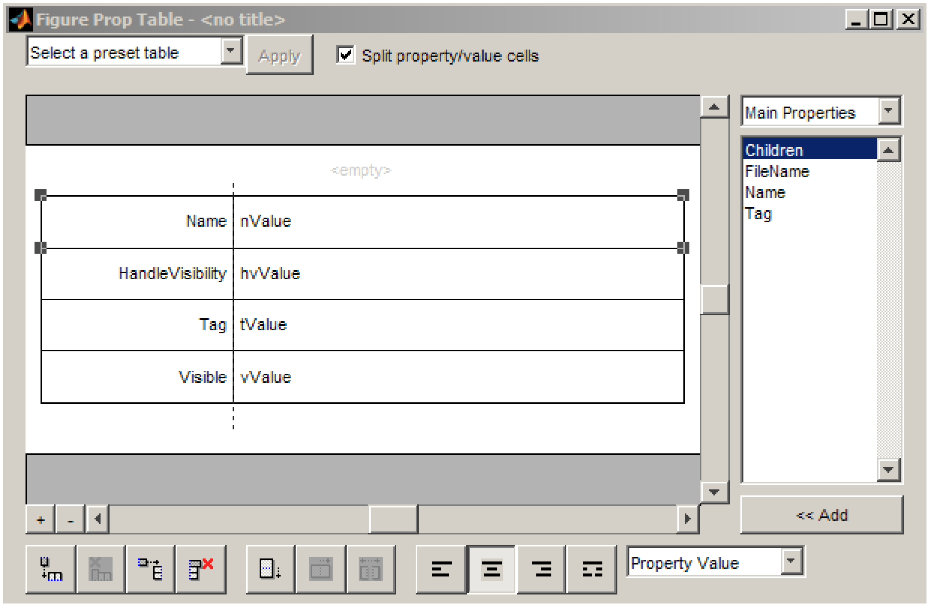
2 Click **Edit**. The table is now in *nonsplit mode*. Nonsplit mode supports more than one property name/property value pair per cell and text.



Name	nValue
HandleVisibility	hvValue
Tag	tValue
Visible	vValue

3 For the property name and property value to appear in adjacent horizontal cells in the table, select the **Split property/value cells** check box. The table is now in

split mode. Split mode supports only one property name/property value pair per cell. If more than one property pair appears in a cell, only the first pair appears in the report; all subsequent pairs are ignored.

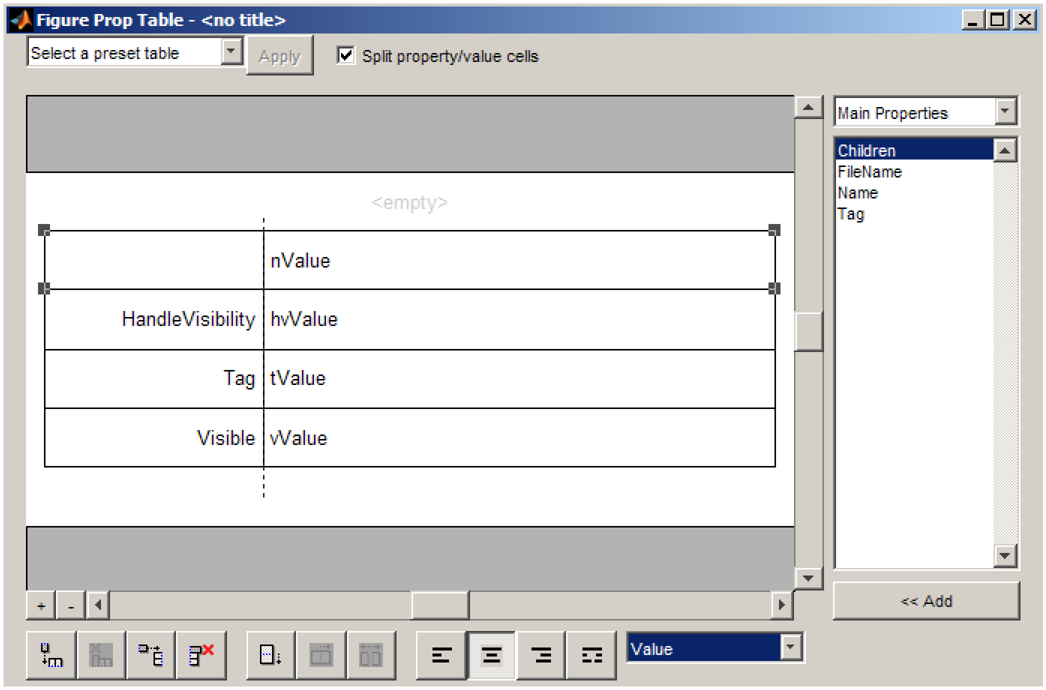


Name	nValue
HandleVisibility	hvValue
Tag	tValue
Visible	vValue

Children
FileName
Name
Tag

Display Options

Property name/property value pairs can appear in cells in several ways. To specify how a given property name/property value pair appears in a cell, select that field in the table (for this tutorial, select the `Name` property). Choose `Value` from the display options drop-down list at the bottom of the dialog box. In the selected table row, only the value appears.

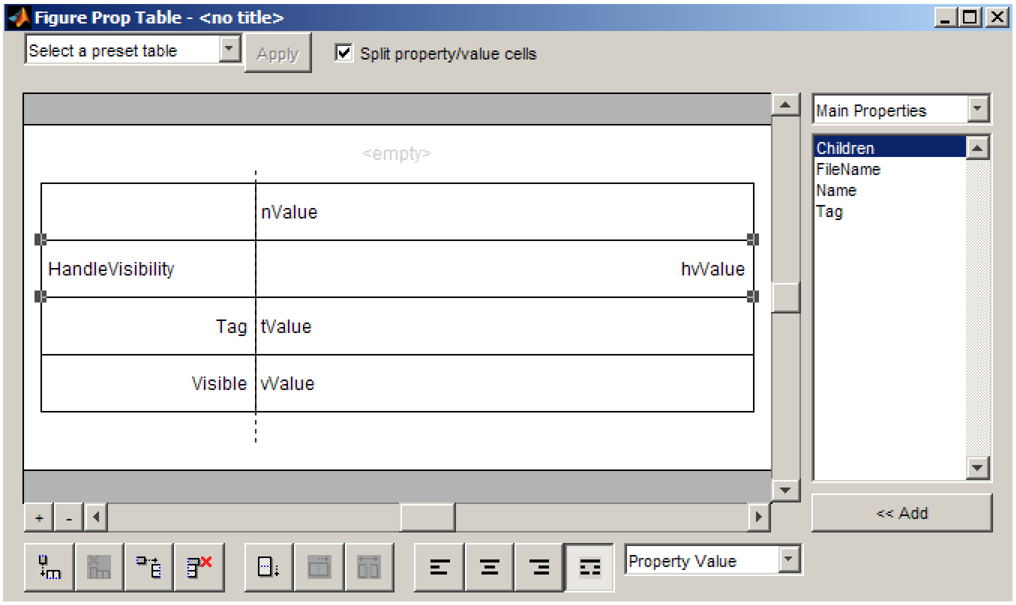


	nValue
HandleVisibility	hvValue
Tag	tValue
Visible	vValue

Format Options

To specify alignment for text in a given cell, in the toolbar at the bottom of the dialog box use the four justification buttons.

Select the `HandleVisibility` table row. Then select the double-justify button (the last button to the right).



Edit Table Titles

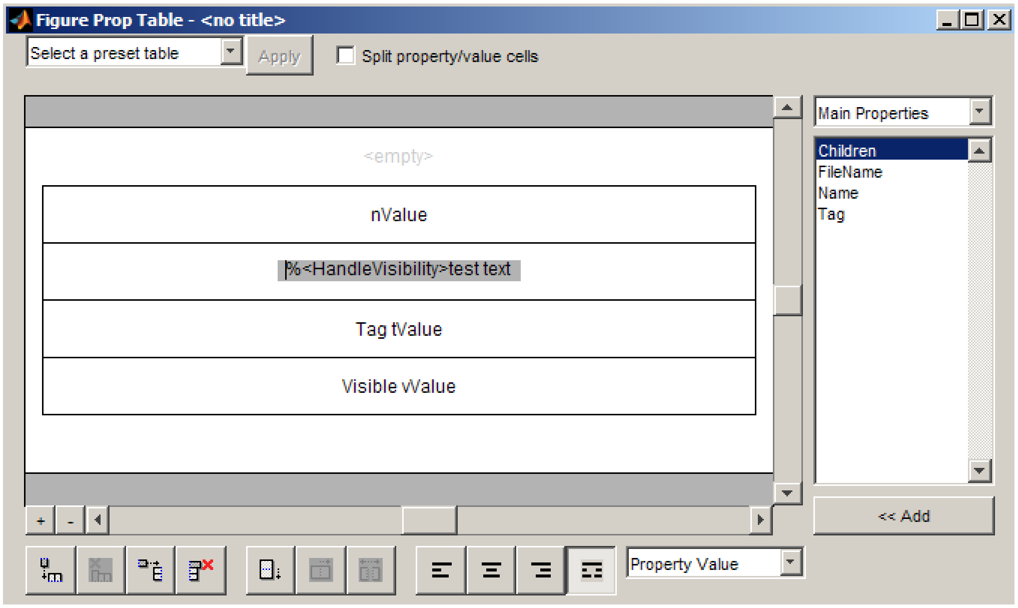
Table titles can contain properties and text. By default, the title of a table is the same as the value of the `%<Name>` property. You can modify this property to modify the table title.

Note: Table titles are always in nonsplit mode.

Enter Text into Table Cells

For the text to be visible, the table must be in nonsplit mode. Clear **Split property/ value cells**.

To enter text into the `HandleVisibility` table cell, double-click the cell. A gray box appears with the label for the cell property.



<empty>

nValue

%<HandleVisibility>test text

Tag tValue

Visible Value

If you type text outside the angle brackets, the text appears as is in the report. Text inside the table brackets must specify a valid property name. If you enter an invalid property name, the property name appears in the report without a property value.

Add, Replace, and Delete Properties in Tables

Adding Table Properties

To add a Handle Graphics property to a table, use the following steps.

1 In the Figure Property Table window, select a table row above which you want add a new property.

2 Click the Add Row Above Current Cell button

A new row appears above the current row.

3 Add the property to the new table row.

a Select the new table row.

b In the Properties Type drop-down list at the upper-right of the dialog box, select a property type.

c In the **Properties** list, select the property you want to add.

d Click the **<< Add** button, or double-click the property name. The property appears in the table row.

Alternatively, if you know the name of the property you want to add, enter the property name directly into the cell as described in “Enter Text into Table Cells”. For information about adding new table rows, see “Add and Delete Columns and Rows”.

Replace Table Properties

To replace a property in a cell of a table in split mode, follow the instructions in “Adding Table Properties” on page 6-13.

Note: You cannot use these steps to delete a property in a cell when the table is in nonsplit mode.

Delete Table Properties

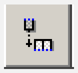
Delete a property by backspacing over it or using the **Delete** key.

Format Table Columns, Rows, and Cells

Add and Delete Columns and Rows

To add or delete a column or row, select a cell and then click one of the buttons described in the following table.

Note: You cannot delete a row or column when it is the only row or column in the table.

Button	Action
	Add column (added to the left of the selected column)

Button	Action
	Delete selected column
	Add row (added above the selected row)
	Delete selected row

Resize Columns

To resize the width of a column, click and drag its vertical borders as needed.

Merge and Split Cells

To merge or split table cells, select a row and then click one of the buttons described in the following table.

Button	Action
	Merge cells downward
	Merge cells to the right
	Split cells

Display or Hide Cell Borders

To toggle cell borders on and off:

1. Place your cursor in a cell and right-click to invoke its context menu.
2. Choose **Cell borders** > **Top**, **Bottom**, **Right**, or **Left** to toggle the specified border on or off.

Zoom and Scroll

You can zoom in and out of the table with the zoom buttons, which are located to the left of the horizontal scroll bar.

Button	Action
⊞	Zoom in
⊟	Zoom out

You can scroll vertically and horizontally using the table scroll bars.

Select a Table

To display property name/property value pairs, you can select a preset table or use a custom table.

- A preset table is built-in and formatted. You can select a preset table in the preset table selection list in the upper-left of the Figure Prop Table window. To apply a preset table, select the table and click **Apply**.
- To create a custom table, select a preset table and modify it to fit your needs by adding and/or deleting rows and properties. You may want to start with the **Blank 4x4** preset table.

Note: You cannot save a custom table as a preset table. If you do so, you lose all changes to the custom table.

Summary Table Components

In this section...

About Summary Table Components

Summary table components insert tables that include specified properties for objects into generated reports. Summary tables contain one object per row, with each object property appearing in a column, as shown in the following summary table in the `figloop-tutorial` report.

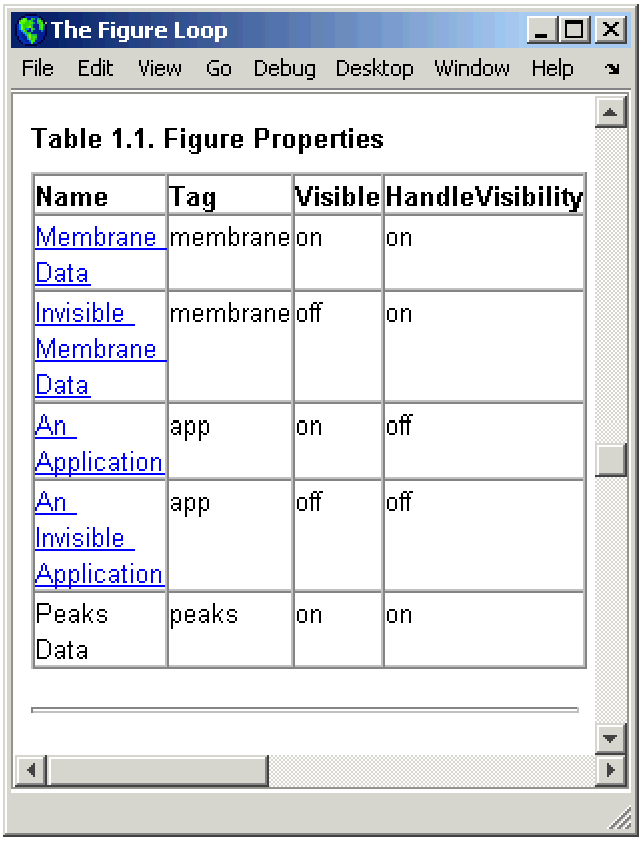


Table 1.1. Figure Properties

Name	Tag	Visible	HandleVisibility
Membrane Data	membrane	on	on
Invisible Membrane Data	membrane	off	on
An Application	app	on	off
An Invisible Application	app	off	off
Peaks Data	peaks	on	on

Many types of summary table components are available, including:

- Handle Graphics Summary Table
- Simulink Summary Table (requires Simulink Report Generator)
- Stateflow Summary Table (requires Simulink Report Generator)

The component used in this example represents MATLAB Report Generator summary table components, all of which exhibit similar behavior

Open the Example Report Template

This example uses the `figloop-tutorial` report template. To open the figure loop tutorial report template, enter the following at the MATLAB command line:

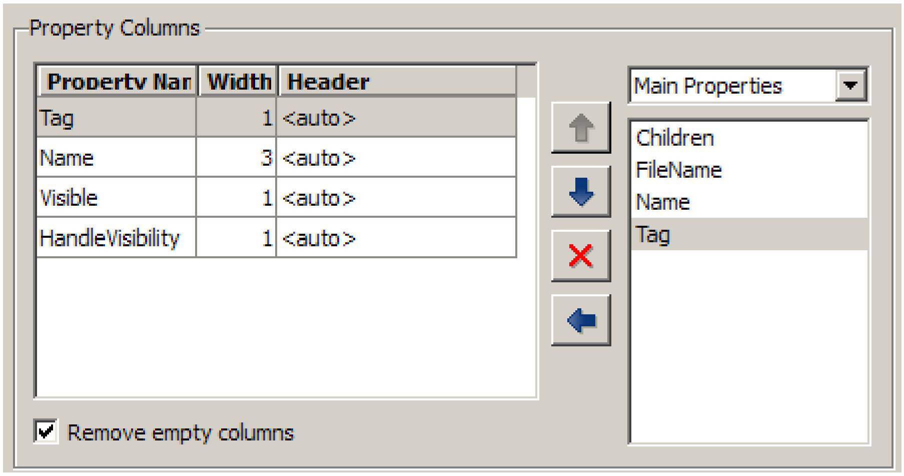
```
setedit figloop-tutorial
```

Select Object Types

You can use the **Object type** selection list to choose Handle Graphics object types for the summary table, including blocks, signals, systems, and models. The `figloop-tutorial` reports on figure objects.

Add and Remove Properties

You can select object properties to appear in the summary table from the Property Columns pane. To add a property to the summary table, select the property category from the property category drop-down box to the right of the **Property columns** table. Each property category has its own list of properties, which appear in the field under the box. The following figure shows `Main Properties` as the selected category.



Property Columns

Property Nar	Width	Header
Tag	1	<auto>
Name	3	<auto>
Visible	1	<auto>
HandleVisibility	1	<auto>

[✓] Remove empty columns

Main Properties

- Children
- FileName
- Name
- Tag

To add a property:

1 Select the category from the property category drop-down box.

2 Select a property in the properties list.

3 Click the Add property button.

The property appears in the **Property columns** table.

To remove a property from the table:

1 Select the property in the **Property columns** table.

2 Click the Delete property ❌ button.

   The property name is removed from the **Property columns** table.

Note: After making changes in the Report Explorer, click **Apply** to make the changes take effect.

You can define your own properties by entering their names into the **Property columns** table using valid variable notation. For more information, see “%<VariableName> Notation” on the `Text` component reference documentation.

Set Relative Column Widths

To apply a relative column width to the summary table columns in the generated report, double-click on the `Width` column of a row in the **Property columns** table . If you do not specify a value for this field, column widths automatically set.

Set Object Row Options

You can use the Object Rows pane to set options for table rows, including anchor, filtering, and sorting options. Select **Insert anchor for each row** to place an anchor in each table row in the report. Use the **Include figures** list to specify what objects to include in the summary table.

Summary table components in `figloop-tutorial` report on figure objects. For more information on options for these figure objects, see the following sections:

- “Loop on the Current Figure”
- “Loop on Visible Figures”
- “Loop on Figures with Tags”

Logical and Looping Components

Logical and looping components execute conditionally, determining when a child component executes or how many times a child component executes.

A *looping component* runs its child components a specified number of times. There are several looping components, such as logical loops, Handle Graphics loops, and model and chart loops. For model and chart loops, you can control aspects such as the order in which the report sorts blocks.

For an example that uses loop components, see “Edit Figure Loop Components”.

You can use loop context functions with loop components. For details, see:

- “Filter with Loop Context Functions” on page 6-22
- “Loop Context Functions” on page 6-24

Filter with Loop Context Functions

In this section...
"Create and Save the Setup File" on page 6-22
"Add Components" on page 6-22
"Run the Report" on page 6-23

Use loop context functions to filter the modeling elements to report on and to perform special reporting on specific elements.

In the following example, in a Block Loop component, you use `RptgenSL.getReportedBlock` in a Logical If component to report on targeted blocks within a Block Loop component.

For a summary of loop context functions, see "Loop Context Functions" on page 6-24.

Create and Save the Setup File

1 Open the f14 model.
2 At the MATLAB command prompt, enter:

```
report
```

3 In the Report Explorer, select **File** > **New**.
4 In the Properties pane, set **Directory** to `Present working directory`.
5 Save the setup file as `inport_outport.rpt`.

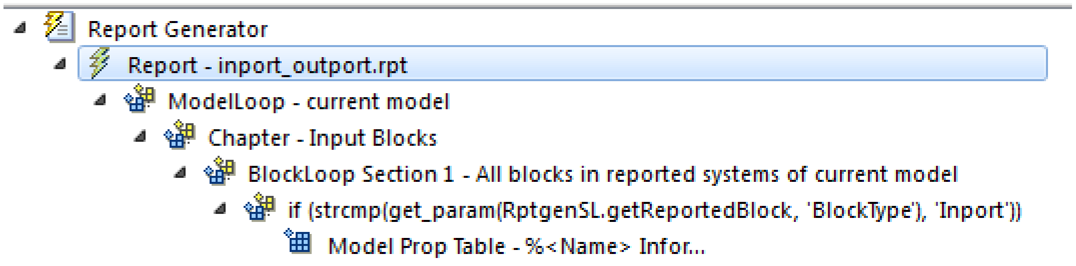
Add Components

Add these components to the report, in order.

From this Library Folder	Add this Component	Set this Property
`Simulink`	Model Loop	N/A
`Formatting`	Chapter	**Title** to `Inport Blocks`
`Simulink`	Block Loop	N/A
`Logical and Flow Control`	Logical If	**Test Expression** to `strcmp(get_param...`

From this Library Folder	Add this Component	Set this Property
		`(RptgenSL.getReportedBlock,'BlockType'),...` `'Inport')`
`Simulink`	Simulink Property Table	N/A

The report setup file looks like this:



```
Report Generator
  Report - inport_outport.rpt
    ModelLoop - current model
      Chapter - Input Blocks
        BlockLoop Section 1 - All blocks in reported systems of current model
          if (strcmp(get_param(RptgenSL.getReportedBlock, 'BlockType'), 'Inport'))
            Model Prop Table - %<Name> Infor...
```

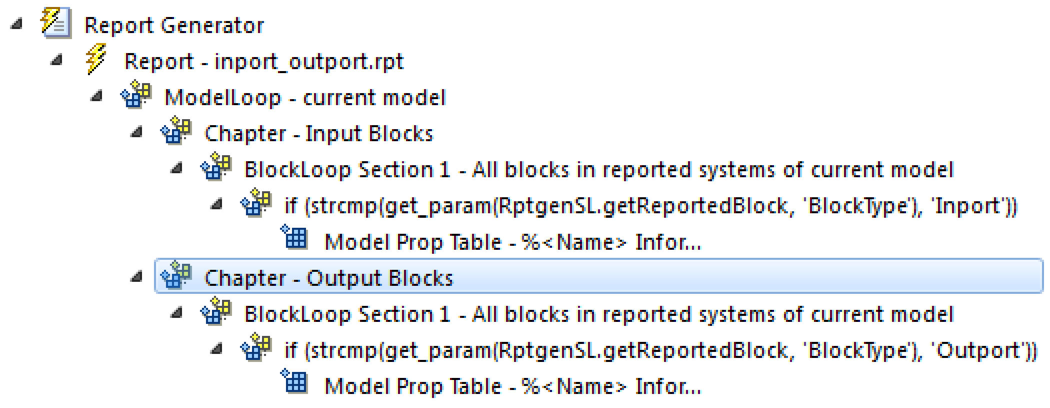
Run the Report

1 Select `inport_outport.rpt`.

2 From the context menu, select **Report**.

The report includes a chapter with properties for the Inport blocks only.

If you wish, create a second chapter that reports on Outport blocks only, as shown below.



```
Report Generator
  Report - inport_outport.rpt
    ModelLoop - current model
      Chapter - Input Blocks
        BlockLoop Section 1 - All blocks in reported systems of current model
          if (strcmp(get_param(RptgenSL.getReportedBlock, 'BlockType'), 'Inport'))
            Model Prop Table - %<Name> Infor...
      Chapter - Output Blocks
        BlockLoop Section 1 - All blocks in reported systems of current model
          if (strcmp(get_param(RptgenSL.getReportedBlock, 'BlockType'), 'Outport'))
            Model Prop Table - %<Name> Infor...
```

Loop Context Functions

In this section...
"For Simulink Modeling Elements" on page 6-24
"For Stateflow Modeling Elements" on page 6-24

You can use these loop context functions in similar ways as shown in "Filter with Loop Context Functions" on page 6-22.

For Simulink Modeling Elements

Modeling Element	Looping Component	Function
Simulink modeling elements		
Block	Block Loop	`RptgenSL.getReportedBlock`
Signal	Signal Loop	`RptgenSL.getReportedSignal`
System	System Loop	`RptgenSL.getReportedSystem`
Model	Model Loop	`RptgenSL.getReportedModel`

For Stateflow Modeling Elements

Modeling Element	Looping Component	Function
Object	Object Loop	`RptgenSF.getReportedObject`
State	State Loop	`RptgenSF.getReportedState`
Chart	Chart Loop	`RptgenSF.getReportedChart`

Edit Figure Loop Components

In this section...

Figure Loop in a Report

This example uses the Figure Loop, which is representative of many types of loops. The Figure Loop component runs its child components several times. In each iteration, the Figure Loop applies its child components to Handle Graphics figures. The `figloop-tutorial` report setup file creates a report that documents several Handle Graphics figures.

1 At the MATLAB command prompt, enter:

```
setedit figloop-tutorial
```

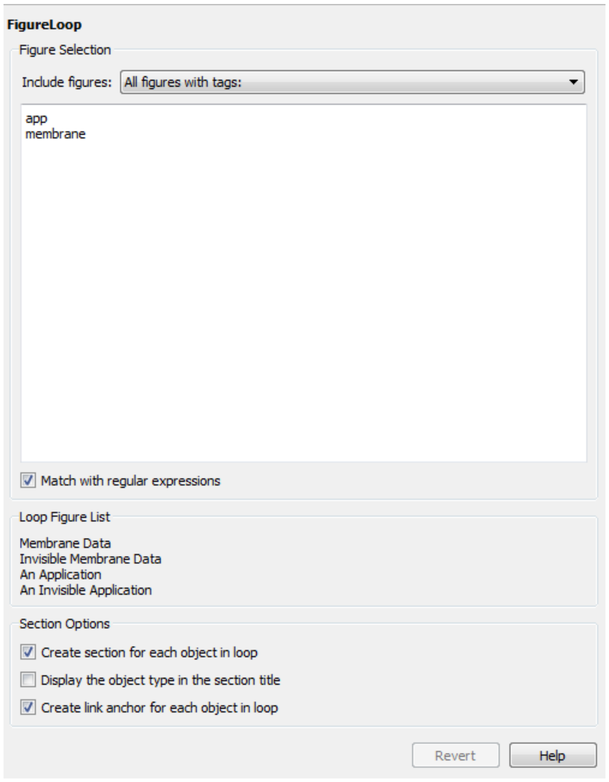
2 To display the Handle Graphics figures, enter:

```
figloopfigures
```

The figures `Membrane Data`, `An Application`, and `Peaks Data` appear on the screen because their `visible` property is `'on'`. The `Invisible Membrane Data` and `An Invisible Application` figures do not appear on screen because their `visible` property is `'off'`. These invisible figures exist, but they are hidden.

3 In the Report Explorer, in the Outline pane on the left, select the Figure Loop component called `Figure Loop Section 1`.

The Properties pane for the Figure Loop component appears.



FigureLoop

Figure Selection

Include figures: All figures with tags:

app
membrane

☑ Match with regular expressions

Loop Figure List

Membrane Data
Invisible Membrane Data
An Application
An Invisible Application

Section Options

☑ Create section for each object in loop
☐ Display the object type in the section title
☑ Create link anchor for each object in loop

Figure Properties

Figure properties control which figures appear in the report. Table 1.1 of the `figloop-tutorial` report includes a summary of the properties of the figures used in this tutorial.

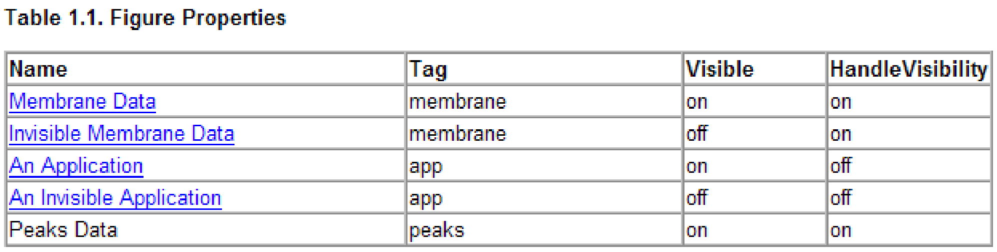


Table 1.1. Figure Properties

Name	Tag	Visible	HandleVisibility
Membrane Data	membrane	on	on
Invisible Membrane Data	membrane	off	on
An Application	app	on	off
An Invisible Application	app	off	off
Peaks Data	peaks	on	on

For this example, do not change these properties. For more information, see "Add, Replace, and Delete Properties in Tables" on page 6-13.

Loop on the Current Figure

To include only the current figure in the report, select `Current figure only` from the **Include figures** selection list. The current figure is the figure that is current when the report generates. This figure may not be the same figure that you selected as the current figure in the Report Explorer before report generation. For example, if the report generation process creates figures in your report, the last figure created with `HandleVisibility` set to `'on'` is the current figure.

Loop on Visible Figures

To include snapshots of all visible figures in your report, in the **Include figures** selection list, select `Visible figures`. This option inserts a snapshot and Property Table for all figures that are currently open and visible.

1 Select the **Data figures only (Exclude applications)** option to exclude figures from the loop whose `HandleVisibility` parameter is `'off'`.
2 To generate the report, in the Report Explorer toolbar click the **Report** button.

In the generated report, scroll down to "Chapter 2 Figures in Report." The `Membrane Data` and `Peaks Data` figures appear in the generated report.

Loop on Figures with Tags

To include figures with specified tags in the report:

1 In the **Include figures** selection list, select the `All figures with tags` option.
2 In the list of tags, delete `membrane`.
3 Click **Report** to generate the report.

The `An Application` and `An Invisible Application` figures appear in the report. They both have an `app` tag.

Modify Loop Section Options

In a loop, a *section* refers to a space in the generated report in which information, including text, images, and tables, appears. You can alter the appearance of sections in each loop appear in the report by using the options in the Figure Loop component's Section Options pane.

- **Create Section for Each Object in Loop** — Create an individual section for each object found in the loop, using the object title as the section title. This option is useful when a loop does not contain a Chapter/Subsection component that organizes the loop results.
- **Display the Object Type in the Section Title** — Precede section titles with object titles. Enable this option by selecting **Create section for each object in loop**. For example:

  1. Enter `membrane` back in the list of tags.
  2. Generate the `figloop-tutorial` report.

     The figures produced by the loop are:

     ```
     Membrane Data
     Invisible Membrane Data
     An Application
     An Invisible Application
     ```
  3. Enable the **Create section for each object in loop** option.
  4. Enable the **Display the Object Type in the Section Title** option.
  5. Generate the `figloop-tutorial` report.

     The figures produced are now:

     ```
     Figure - Membrane Data
     Figure - Invisible Membrane Data
     Figure - An Application
     Figure - An Invisible Application
     ```

     The figures produced are now:

     ```
     Figure - Membrane Data
     Figure - Invisible Membrane Data
     Figure - An Application
     Figure - An Invisible Application
     ```
- **Create a Link Anchor for Each Object in Loop** — Create a hyperlink to the object in the generated report.

Compare Simulink Model XML Files

About Simulink Model XML Comparison

In this section...

Creating XML Comparison Reports

If you have Simulink Report Generator software, you can compare XML text files from Simulink models.

You can select a pair of Simulink models to compare their XML files. You can use models from any version of Simulink. The XML comparison tool produces a comparison report based on the SLX files. You can use the report to explore the differences, view the changes highlighted in the original models, and merge differences.

You can access the XML comparison tool from:

- The MATLAB Current Folder browser context menu
- The MATLAB Comparison Tool
- The MATLAB command line
- The Simulink Editor **Analysis** menu
- The Simulink Project Modified Files view

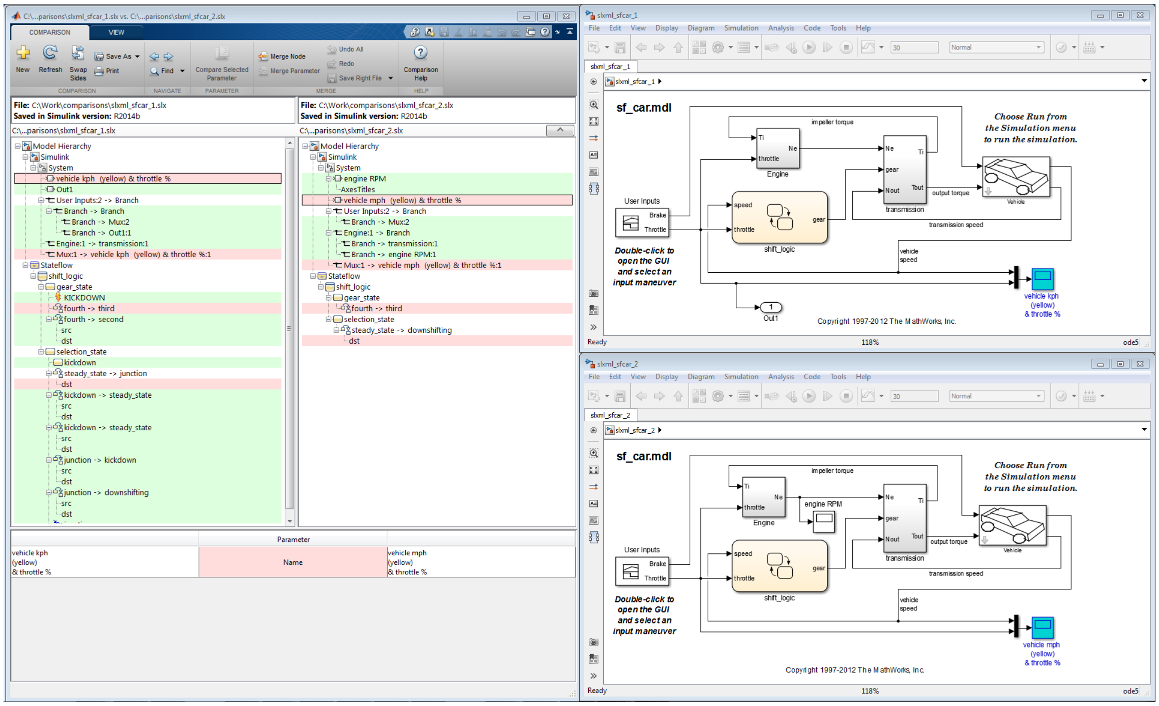
The Simulink Report Generator XML comparison functionality is an extension of the MATLAB Report Generator XML comparison feature.

You can use the XML comparison tool with both model file formats, SLX and MDL. If the selected files are `.mdl` files, the XML comparison tool first exports the `.mdl` files to SLX files in a temporary directory. The XML comparison tool then produces a comparison report based on the SLX files.

For more information on creating reports, see "Select Simulink Models for XML Comparison" on page 7-5.

Using XML Comparison Reports

You can display XML comparison reports in the MATLAB Comparison Tool. The comparison tool processes the output of the XML comparison into an interactive report with links that you can click to reverse annotate from the XML tag comparison to the corresponding Simulink models. “Reverse annotation” means when you click items in the report, Simulink Report Generator displays the corresponding items highlighted in the original models, as shown in the following example.



File: C:\Work\comparisons\slxml_sfcar_1.slx
Saved in Simulink version: R2014b

C:\...parisons\slxml_sfcar_1.slx

```
Model Hierarchy
  Simulink
    System
      vehicle kph  (yellow) & throttle %
      Out1
      User Inputs:2 -> Branch
        Branch -> Branch
          Branch -> Mux:2
          Branch -> Out1:1
      Engine:1 -> transmission:1
      Mux:1 -> vehicle kph  (yellow) & throttle %:1
  Stateflow
    shift_logic
      gear_state
        KICKDOWN
        fourth -> third
        fourth -> second
          src
          dst
      selection_state
        kickdown
        steady_state -> junction
          dst
        kickdown -> steady_state
          src
          dst
        kickdown -> steady_state
          src
          dst
        junction -> kickdown
          src
          dst
        junction -> downshifting
          src
          dst
```

File: C:\Work\comparisons\slxml_sfcar_2.slx
Saved in Simulink version: R2014b

C:\...parisons\slxml_sfcar_2.slx

```
Model Hierarchy
  Simulink
    System
      engine RPM
        AxesTitles
      vehicle mph  (yellow) & throttle %
      User Inputs:2 -> Branch
        Branch -> Mux:2
      Engine:1 -> Branch
        Branch -> transmission:1
        Branch -> engine RPM:1
      Mux:1 -> vehicle mph  (yellow) & throttle %:1
  Stateflow
    shift_logic
      gear_state
        fourth -> third
      selection_state
        steady_state -> downshifting
          dst
```

	Parameter	
vehicle kph (yellow) & throttle %	Name	vehicle mph (yellow) & throttle %

The XML comparison report shows a hierarchical view of the portions of the two XML files that differ. The report does not show sections of the files that are identical.

If the files are identical you see a message reporting there are no differences.

If files have not been saved, you see an error message informing you that you must save modified or newly created models before running an XML comparison.

Note: It might not be possible for the analysis to detect matches between previously corresponding sections of files that have diverged too much.

Change detection in the Chawathe analysis is based on a scoring algorithm. Items match if their Chawathe score is above a threshold. The Simulink Report Generator implementation of Chawathe's algorithm uses a comparison pattern that defines the thresholds assigned to particular node types (e.g., “block”). For more information, see “How the Matching Algorithm Works” in the MATLAB Report Generator documentation.

For more information on using the report, see “Compare Simulink Model XML Files” on page 7-8.

To control reverse annotation, see “Display Items in Original Models” on page 7-17.

To merge differences, see “Merge Simulink Models from the Comparison Report” on page 7-21.

For more information about the Comparison Tool, see “Comparing Files and Folders” in the MATLAB documentation.

Select Simulink Models for XML Comparison

In this section...

To learn what you can do with XML comparison reports, see "About Simulink Model XML Comparison" on page 7-2.

Select Files from the Simulink Editor

To compare files using the Simulink Editor:

1. Select **Analysis** > **Compare Simulink XML Files**.

   The Select Files or Folders for Comparison dialog box opens.
2. If the Editor currently displays a model, the current model name and path appear automatically selected in the **First file or folder** edit box. Use the browse buttons to locate and select files for the first and second model files.
3. When you click **Compare**, the XML comparison tool performs the analysis, and displays the resulting report in the Comparison Tool.

Select Files from the Current Folder Browser

To compare two files from the Current Folder browser:

- For two files in the same folder, select the files, right-click and select **Compare Selected Files/Folders**.
- To compare files in different folders:

  1. Select a file, right-click and select **Compare Against**

2 Select the second file to compare in the Select Files or Folders for Comparison dialog box.
3 Leave the default **Comparison type**, `Simulink XML text comparison`.
4 Click **Compare**.

If the selected files are XML or model files, the XML text comparison tool performs a Chawathe analysis and displays a report in the Comparison Tool.

For more information about comparisons of other file types (e.g., text, MAT, or binary) with the Comparison Tool, see “Comparing Files and Folders” in the MATLAB documentation.

Select Files from a Simulink Project

If you have a Simulink Project using source control, you can create an XML comparison report from the Modified Files view of the Simulink Project Tool. For details, see “Project Management”.

Select Files from the Comparison Tool

To compare files using the Comparison Tool, from the MATLAB Toolstrip, in the **File** section, select the **Compare** button. In the dialog box select files to compare.

If the selected files are XML or model files, the XML text comparison tool performs a Chawathe analysis and displays a report in the Comparison Tool.

Select Files from the Command Line

To compare XML files from the command line, enter

```
visdiff(filename1, filename2)
```

where `filename1` and `filename1` are XML files or Simulink models.

If the files are models, the XML comparison tool performs the comparison on the XML files. This XML comparison functionality is an extension to the MATLAB `visdiff` function. `visdiff` produces a report in the Comparison Tool.

To create an `xmlcomp.Edits` object at the command line without opening the Comparison Tool, enter:

`Edits = slxmlcomp.compare(`*`modelname_A`*`,`*`modelname_B`*`)`
See “Export Results to the Workspace” on page 7-30 for information about the `xmlcomp.Edits` object.

Choose a Comparison Type

If you specify two XML or model files to compare using either the Current Folder Browser or the `visdiff` function, then the Comparison Tool automatically performs the default comparison type. The defaults are `XML text comparison` for XML files and `Simulink XML text comparison` for model files.

To change comparison type, either create a new comparison from the Comparison Tool, or use the **Compare Against** option from the Current Folder browser. You can change comparison type in the Select Files or Folders for Comparison dialog box. For example, if you want the MATLAB text differences report for XML or model files, change the comparison type to `Text comparison` in the dialog before clicking **Compare**.

Examples of XML Comparison

For examples with instructions, see:

- `slxml_radar_matlab_function`
- `slxml_sfcar`
- `slxml_truthtables`

For information on using and understanding the report and the XML comparison functionality, refer to “Compare Simulink Model XML Files” on page 7-8.

Compare Simulink Model XML Files

In this section...

Navigate the Simulink XML Comparison Report

You can select a pair of Simulink models to compare their XML files. You can use models from any version of Simulink. The XML comparison tool produces a comparison report based on the SLX files. You can use the report to explore the differences, view the changes highlighted in the original models, and merge differences.

The XML Comparison report shows changes only, not the entire XML text file contents. The report shows a hierarchical view of the portions of the two XML files that differ. The report does not show sections of the files that are identical. To learn about the report, see "About Simulink Model XML Comparison" on page 7-2.

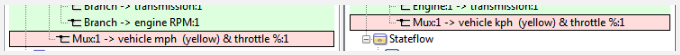
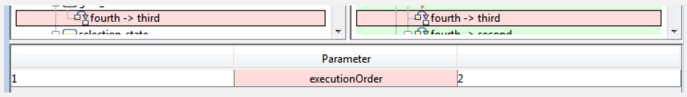
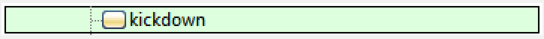
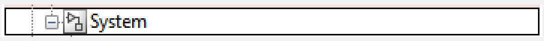
To *step through differences*, use the **Comparison** tab on the toolstrip. To move to the next or previous group of differences, on the **Comparison** tab, in the **Navigate** section, click the arrow buttons to go to the previous or next difference. See "Step Through Changes" on page 7-10.

You can also click to select items in the hierarchical trees and observe the following display features:

- Selected items appear highlighted in a box.
- If the selected item is part of a matched pair it is highlighted in a box in both left and right trees.

- When you select an item, the original model displays and the corresponding item is highlighted. See “Explore Changes in the Original Models” on page 7-11.

Report item highlighting indicates the nature of each difference as follows:

Type of report item	Highlighting	Notes
Modified	Pink	Modified items are matched pairs that differ between the two files. When you select a modified item it is highlighted in a box in both trees. Example of a modified pair of nodes:  Branch -> engine RPM:1 Mux:1 -> vehicle mph (yellow) & throttle %:1 Mux:1 -> vehicle kph (yellow) & throttle %:1 Stateflow Changed parameters for the selected pair are displayed in a separate **Parameters** panel for review. If strings are too long to display in the **Parameters** table, right-click and select **Compare as Text** to open a new comparison of the parameters. Example of modified parameters:  fourth -> third fourth -> third Parameter 1 | executionOrder | 2
Unmatched	Green	When you select an unmatched item it is highlighted in a box in one tree only. Example of an unmatched node:  kickdown
Container	None	Rows with no highlighting indicate a container item that contains other modified or unmatched items. Example of a container node:  System

Icons indicate the category of item, for example: model, subsystem, Stateflow machine or chart, block, line, parameter, etc.

To expand or filter the tree view, use the **View** tab controls on the toolstrip for the following functions:

- **Expand All** — Expands every item in the tree.

  Tip Right-click to expand or collapse the hierarchy within the selected tree node.

- **Collapse All** — Collapses all items in the tree to the most compact view possible.
- **Filter** — Opens the Filter list. Select check boxes to enable or disable display of categories of changes in the report. Use the filters to show only the changes you are interested in. By default the report hides all nonfunctional changes, such as repositioning of items. Turn off filters to explore *all* differences including nonfunctional changes. See "Filter Out Differences" on page 7-13.

If you want to swap the files, on the **Comparison** tab, select **Swap Sides**. The report swaps the sides and reruns the comparison. **Refresh** also runs the analysis again.

To create a new report, see "Select Simulink Models for XML Comparison" on page 7-5.

For examples with instructions, see also "Examples of XML Comparison" on page 7-7 .

Step Through Changes

On the **Comparison** tab, in the **Navigate** section, when you click the **Next** arrow button (or press the Down key when the report has focus), you step through groups of changes in the report, in the following order:

1. The first time you click **Next**, it selects the first changed (pink) or inserted (green) node on the left tree.
2. Step through the differences with the **Next** button.

   - When selected items have a match in the right tree then they are also highlighted.
   - Next skips white nodes with no color background. White nodes are parts of the hierarchy that contain no differences.
   - If there is an insertion or deletion with child nodes, **Next** skips the child nodes if they are all also insertions or deletions. For example, if you insert a subsystem, **Next** selects the top subsystem node, then skips all the nodes inside the subsystem (if they are all also insertions) and selects the next difference.

- **Next** minimizes context switching when highlighting in models. When you click **Next**, the report steps through all differences at the same level of the model, subsystem, or chart, in both left and right trees in the report, before moving to the next level of the report. For example, you step through all differences in a subsystem in the left and right trees, before moving to another subsystem.

3 When you have stepped through all changes, **Next** returns to the beginning of the left tree.

If you click an item in the report, the **Next**/**Previous** controls will step through changes from the point you selected.

Explore Changes in the Original Models

When you compare the XML text files from Simulink® models, you can choose to display the corresponding items in the original models when you select report items. You can use this reverse annotation function to explore the changes in the original models. When you select an item, the report invokes reverse annotation to the original model and highlights the corresponding item in the model.

Control the display by using the **View** tab **Highlight in Models** button and the **Always Highlight** check box.

Tip Click a Subsystem contents node to see the report highlight all visible modified objects in the subsystem.

For details, see "Display Items in Original Models" on page 7-17.

Merge Differences

Tip You can only merge from left to right. If you want to merge into the other file, use **Swap Sides** before you start merging. Swap Sides reverts any merges already made and creates a new comparison report for the original files.

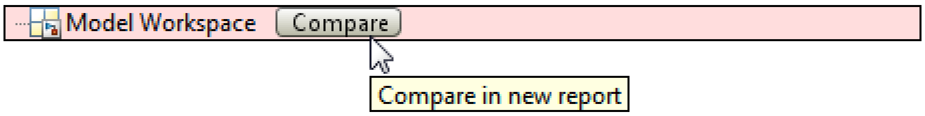
To merge a selection, use the following buttons on the **Comparison** tab, in the **Merge** section:

- **Merge Node** — Merge the selected node from the left side of the report to the right.
- **Merge Parameter** — Merge the selected parameter from the left side of the report to the right.
- **Undo All** — Revert all merge operations.

For more information, see “Merge Simulink Models from the Comparison Report” on page 7-21.

Open Child Comparison Reports for Selected Nodes

If additional comparisons are available for particular nodes, you see a **Compare** button to open a report for that pair of nodes. For example, if there are differences in the Model Workspace, you can click **Compare** to open a new report to explore differences in variables.



You can open child reports for parameters, MATLAB Function blocks, truth tables and Model Workspaces.

- To compare parameters, click the Parameters pane, then on the **Comparison** tab select **Compare Selected Parameter**. This opens a new report for the currently selected pair of parameters. Use this when the report cannot display all the details in the Parameters pane, e.g., long strings or a script.
- If the original models contain MATLAB Function block components, and if differences are found, the XML comparison tool lists them in the Stateflow section of the report. Click the **Compare** button at the end of the MATLAB Function block report items to open new comparisons in the Comparison Tool, showing the text difference reports for the MATLAB Function block components. You can merge differences in MATLAB Function block code from the text comparison report. See “Merge Simulink Models from the Comparison Report” on page 7-21, and the example `slxml_radar_matlab_function`.
- If the original models contain truth tables, and if differences are found, the XML comparison tool lists them in the Stateflow section of the report.
  - Click the **Compare** button at the end of the MATLAB Function node to see a summary of all changes.

- Click the `truthtable` node to reverse annotate and display both truthtable editors.
- Click the **Compare** button at the end of the `Condition Table` node to open a new text comparison showing only Condition differences.
- Similarly click the **Compare** button for `Action Table` to view only Action changes.

See the example `slxml_truthtables`.

Understand the Report Hierarchy and Matching

Hierarchical node tags (such as subsystem tags in the `.xml` file) appear twice in the tree as nested nodes. This is because the container node and the contents can have separate differences in their properties. This feature of the XML report allows you to distinguish between property differences of the node itself, and differences contained within nodes nested inside.

To understand matching results within an XML comparison report, see “How the Matching Algorithm Works” in the MATLAB Report Generator documentation.

Note: It might not be possible for the analysis to detect matches between previously corresponding sections of files that have diverged too much.

If you cannot see changes you expected to see in the report, on the **View** tab, click the **Filter** button to turn off filters and see *all* identified changes. See “Filter Out Differences” on page 7-13.

Comparing Signal Builder Blocks

You can see differences in Signal Builder blocks when you have not touched them. This occurs because Signal Builder blocks generate new handles when you load a model. The report shows that the handles have changed. To view the differences, click the **Compare** button in the report and observe that handles called `blockH` and `modelH` are different.

Filter Out Differences

You can use the **Filter** button on the **View** tab to control display of categories of changes. Turn off filtering to view *all* identified changes.

In the **Filter** list, select check boxes to enable or disable display of categories of changes in the report. Use the filters to show only the changes you are interested in. By default the report hides all nonfunctional changes, such as repositioning of items. Turn off filters to explore all differences including nonfunctional changes. Try this if you cannot see changes you expected to see in the report.

Categories for filtering include:

- **Hide changes in lines**. Hide all changes to signal lines including functional changes.
- **Hide nonfunctional changes**. The report processing identifies certain items in the XML file as nonfunctional, for example, tags representing parameters such as block, system, chart or label positions, font and color settings for blocks and lines, and system print and display settings. The report processing tries to identify "consequential" changes as nonfunctional (that is, changes as a consequence of another change). For example, if a block name changes from `block_A` to `block_B`, a line emerging from that block has a change in its source block parameter. This change in the line parameters is considered nonfunctional. Lines are highly functional, but line changes can be very noisy because of changes in blocks they connect to.
- **Hide changes in graphical interface**. This information is a summary of inports and outports at the top level of the model. Filter graphical interface changes to avoid duplication in the report, as any changes in root ports are also reported as functional changes where you can use reverse annotation.
- **Hide changes in block parameter defaults**. Hiding changes in defaults can avoid duplication in the report, as any changes in blocks are also reported as functional changes where you can use reverse annotation. Block parameter defaults are an undocumented part of the Simulink XML file that store the default parameters for the blocks used in a model.

Exceptions

The report does *not* filter out changes to Block and System names, annotations, and Stateflow Notes as nonfunctional, even though changes to these items do not affect the outcome of simulation. The report always displays these changes to facilitate review of code changes, because they can contain important information about users' intentions.

In certain rare cases the report filters out changes that can impact the behavior of the design. By default moves are filtered as nonfunctional, but in the following cases moves can change design behavior:

- Moving blocks can in some cases change the execution order.

- In a Stateflow chart, if you move states or junctions so that they intersect, the model fails to simulate.

To view these types of changes in the report, turn off the filter for nonfunctional changes.

Change Color Preferences

You can change and save your diff color preferences for the Comparison tool. You can apply your color preferences to all comparison types.

1. On the MATLAB Home tab, click **Preferences**.
2. In the Preferences dialog box, under **MATLAB**, click **Comparison**.
3. Edit color settings as desired for differences and merges. View the colors in the **Sample** pane.

   The **Active Settings** list displays **Default (modified)**.
4. To use your modified settings in the comparison, click **Apply** and refresh the comparison report.
5. To return to the default color settings, in the Preferences dialog box, click **Reset** and click **Apply**. Refresh the comparison report.
6. If you want to save your modified color preferences for use in future MATLAB sessions, click **Save As**. Enter a name for your color settings profile and click **OK**.

   After saving settings, you can select them in the **Active Settings** list.

Save Comparison Results

To save your comparison results, use these **Comparison** tab buttons:

- **Save As** > **HTML**, **Word**, or **Basic HTML** — Open the Save dialog box, where you can choose to save a printable version of the XML comparison report. See “Save Printable HTML Report” on page 7-30.
- **Save As** > **Workspace variable** — Export XML comparison results to workspace. See “Export Results to the Workspace” on page 7-30.

Related Examples

- “Select Simulink Models for XML Comparison” on page 7-5

- “Display Items in Original Models” on page 7-17
- “Merge Simulink Models from the Comparison Report” on page 7-21
- “Compare XML from Models Managed with Subversion” on page 7-36
- “Compare Revisions”
- “Source Control in Simulink Project”

More About

- “About Simulink Model XML Comparison” on page 7-2
- “Comparing XML Files from Models with Identical Names” on page 7-33
- “Work with Referenced Models and Library Links” on page 7-34

Display Items in Original Models

In this section...

Highlighting in Models

When you compare the XML text files from Simulink models, you can choose to display the corresponding items in the original models when you select report items. You can use this *reverse annotation* function to explore the changes in the original models. When you select an item, the report invokes reverse annotation to the original model and highlights the corresponding item in the model.

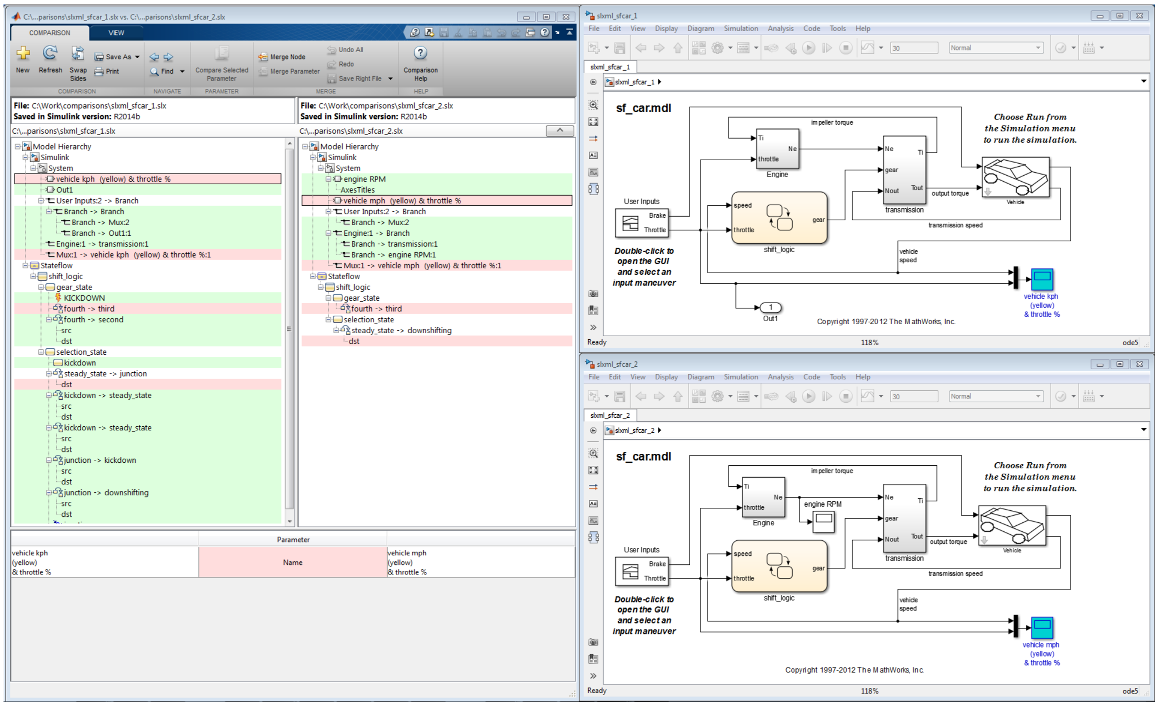
Tip If you click a Subsystem contents node, the report highlights all visible modified objects in the subsystem.

Click a report entry to view the highlighted item (or its parent) in the model:

- If the item occurs in both models, they both appear with highlighting.
- If there is no match for the item, the unmatched report item row is green. It is considered unique and appears highlighted by itself.

  When there is no match in the other model, the report highlights the first matched ancestor to show the context of the missing item. If this ancestor is a system or subsystem, then the report highlights all visible modified objects in the system.
- If the XML comparison tool cannot highlight an item directly (e.g., configuration parameters), then it highlights the nearest ancestor of the selected node.

The following screenshots show reverse annotation of Simulink and Stateflow items in original models using the example slxml_sfcar.


C:\...parisons\slxml_sfcar_1.slx vs. C:\...parisons\slxml_sfcar_2.slx
COMPARISON
VIEW
New
Refresh
Swap Sides
Save As
Print
Find
Compare Selected Parameter
Merge Node
Merge Parameter
Undo All
Redo
Save Right File
Comparison Help
COMPARISON
NAVIGATE
PARAMETER
MERGE
HELP
slxml_sfcar_1
slxml_sfcar_2
File Edit View Display Diagram Simulation Analysis Code Tools Help
sf_car.mdl
impeller torque
engine RPM
Ti
Ne
throttle
Engine
gear
Nout
Tout
transmission
output torque
Vehicle
transmission speed
User Inputs
Brake
Throttle
speed
shift_logic
vehicle speed
Choose Run from the Simulation menu to run the simulation.
Double-click to open the GUI and select an input maneuver
Out1
vehicle kph (yellow) & throttle %
vehicle mph (yellow) & throttle %
Copyright 1997-2012 The MathWorks, Inc.
Ready
118%
ode5

File: C:\Work\comparisons\slxml_sfcar_1.slx
Saved in Simulink version: R2014b

C:\...parisons\slxml_sfcar_1.slx

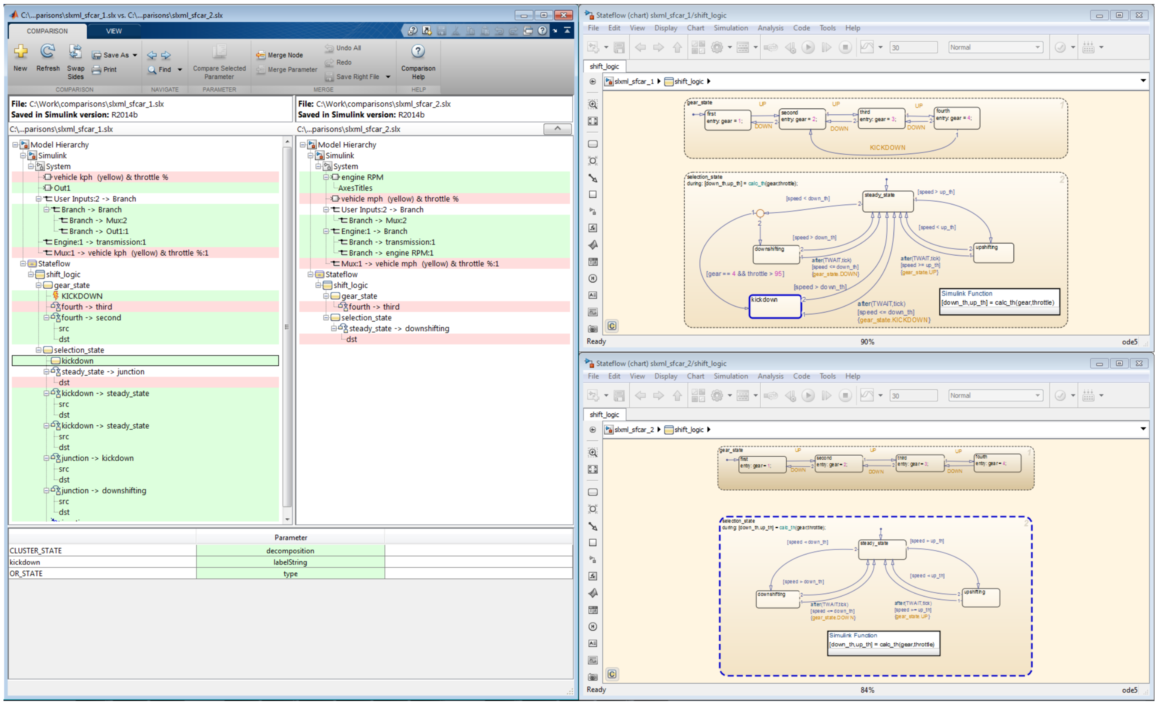
```
Model Hierarchy
  Simulink
    System
      vehicle kph  (yellow) & throttle %
      Out1
      User Inputs:2 -> Branch
        Branch -> Branch
          Branch -> Mux:2
          Branch -> Out1:1
      Engine:1 -> transmission:1
      Mux:1 -> vehicle kph  (yellow) & throttle %:1
  Stateflow
    shift_logic
      gear_state
        KICKDOWN
        fourth -> third
        fourth -> second
          src
          dst
      selection_state
        kickdown
        steady_state -> junction
          dst
        kickdown -> steady_state
          src
          dst
        kickdown -> steady_state
          src
          dst
        junction -> kickdown
          src
          dst
        junction -> downshifting
          src
          dst
```

File: C:\Work\comparisons\slxml_sfcar_2.slx
Saved in Simulink version: R2014b

C:\...parisons\slxml_sfcar_2.slx

```
Model Hierarchy
  Simulink
    System
      engine RPM
        AxesTitles
      vehicle mph  (yellow) & throttle %
      User Inputs:2 -> Branch
        Branch -> Mux:2
      Engine:1 -> Branch
        Branch -> transmission:1
        Branch -> engine RPM:1
      Mux:1 -> vehicle mph  (yellow) & throttle %:1
  Stateflow
    shift_logic
      gear_state
        fourth -> third
      selection_state
        steady_state -> downshifting
          dst
```

	Parameter	
vehicle kph (yellow) & throttle %	Name	vehicle mph (yellow) & throttle %


C:\...parisons\slxml_sfcar_1.slx vs. C:\...parisons\slxml_sfcar_2.slx
COMPARISON
VIEW
New
Refresh
Swap Sides
Save As
Print
Find
Compare Selected Parameter
Merge Node
Merge Parameter
Undo All
Redo
Save Right File
Comparison Help
Stateflow (chart) slxml_sfcar_1/shift_logic
Stateflow (chart) slxml_sfcar_2/shift_logic
Ready
90%
84%
ode5

File: C:\Work\comparisons\slxml_sfcar_1.slx
Saved in Simulink version: R2014b

```
C:\...parisons\slxml_sfcar_1.slx
Model Hierarchy
  Simulink
    System
      vehicle kph  (yellow) & throttle %
      Out1
      User Inputs:2 -> Branch
        Branch -> Branch
          Branch -> Mux:2
          Branch -> Out1:1
      Engine:1 -> transmission:1
      Mux:1 -> vehicle kph  (yellow) & throttle %:1
  Stateflow
    shift_logic
      gear_state
        KICKDOWN
        fourth -> third
        fourth -> second
          src
          dst
      selection_state
        kickdown
        steady_state -> junction
          dst
        kickdown -> steady_state
          src
          dst
        kickdown -> steady_state
          src
          dst
        junction -> kickdown
          src
          dst
        junction -> downshifting
          src
          dst
```

File: C:\Work\comparisons\slxml_sfcar_2.slx
Saved in Simulink version: R2014b

```
C:\...parisons\slxml_sfcar_2.slx
Model Hierarchy
  Simulink
    System
      engine RPM
        AxesTitles
      vehicle mph  (yellow) & throttle %
      User Inputs:2 -> Branch
        Branch -> Mux:2
      Engine:1 -> Branch
        Branch -> transmission:1
        Branch -> engine RPM:1
      Mux:1 -> vehicle mph  (yellow) & throttle %:1
  Stateflow
    shift_logic
      gear_state
        fourth -> third
      selection_state
        steady_state -> downshifting
          dst
```

	Parameter	
CLUSTER_STATE	decomposition	
kickdown	labelString	
OR_STATE	type	

Control Highlighting in Models

To control highlighting in models, on the **View** tab in the Comparison Tool, select or clear the check box **Always Highlight**. You can click the **Highlight in Models** button to highlight the currently selected report node at any time. This can be useful if you turn off automatic highlighting and only want to display specific nodes.

By default, models display to the right of the comparison report, with the model corresponding to the left side of the report on top, and the right below. If you move or resize the models your position settings are respected by subsequent model highlighting operations within the same session. The tool remembers your window positions.

If you want to preserve window positions across sessions, position the window, and then enter:

```
slxmlcomp.storeWindowPositions
```

This preserves the placement of any Simulink windows, Stateflow windows, and truth table windows.

To stop storing window positions and return to the defaults, enter:

```
slxmlcomp.clearWindowPositions
```

View Changes in Model Configuration Parameters

You can use the report to explore differences in the model Configuration Parameters. If you select a Configuration Parameter item, the report displays the appropriate root node pane, if possible, of both Configuration Parameters dialog boxes.

The Parameters pane of the report displays the label text from the dialog controls (or the parameter name if it is command line only), and the parameter values. Some configuration parameters have a different hierarchy in the XML file and the dialog box. You can right-click to merge a selected parameter value in the Parameters pane.

Related Examples

- “Select Simulink Models for XML Comparison” on page 7-5
- “Compare Simulink Model XML Files” on page 7-8
- “Merge Simulink Models from the Comparison Report” on page 7-21
- “Compare Revisions”

More About

- “About Simulink Model XML Comparison” on page 7-2

Merge Simulink Models from the Comparison Report

In this section...

Merge tools enable you to:

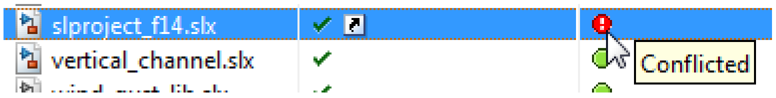
- Resolve conflicts in model files under source control using three-way merge. Open by selecting **View Conflicts**.
- Merge any two model files using two-way merge. Open by selecting **Compare** context menu items.
- Merge MATLAB Function block code using text comparison reports.

Resolve Conflicts Using Three-Way Model Merge

If you have a conflicted model file under source control in Simulink Project or in the Current Folder browser, right-click and select **View Conflicts**. You can resolve the conflicts in the Three-Way Model Merge tool. Examine your local file compared to the conflicting revision and the base ancestor file, and decide which changes to keep. You can resolve the conflict and submit your changes.

1 To try an example three-way merge, enter `slxml_three_way_merge`.

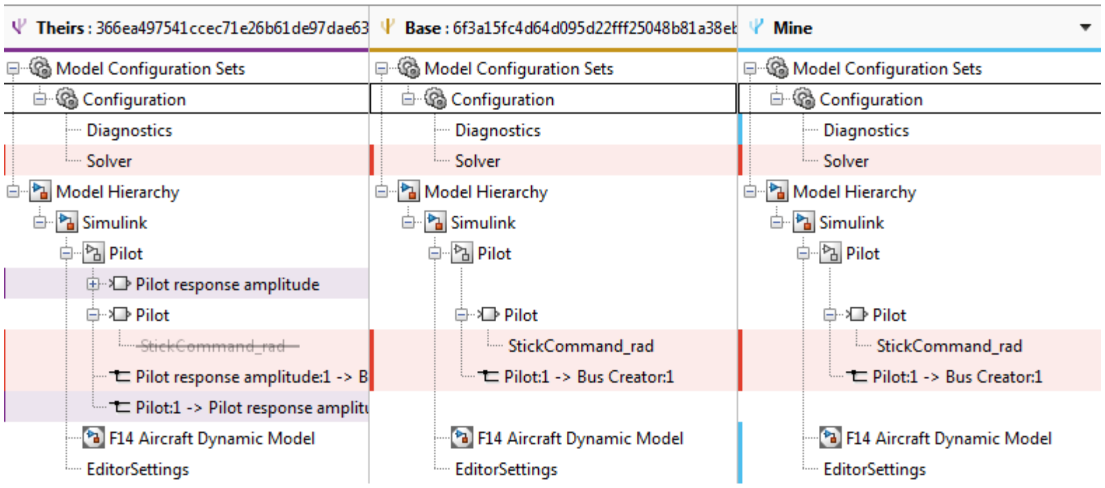
2 In the Simulink Project locate the conflicted model file, right-click and select **View Conflicts**. You can only see **View Conflicts** in the context menu if your file is marked conflicted by the source control.



The Merge tool automatically resolves every difference that it can, and shows the results in the **Target** pane. Review the automerge choices, edit if desired, and decide how to resolve any remaining conflicts.

1 Examine the Merge report columns.

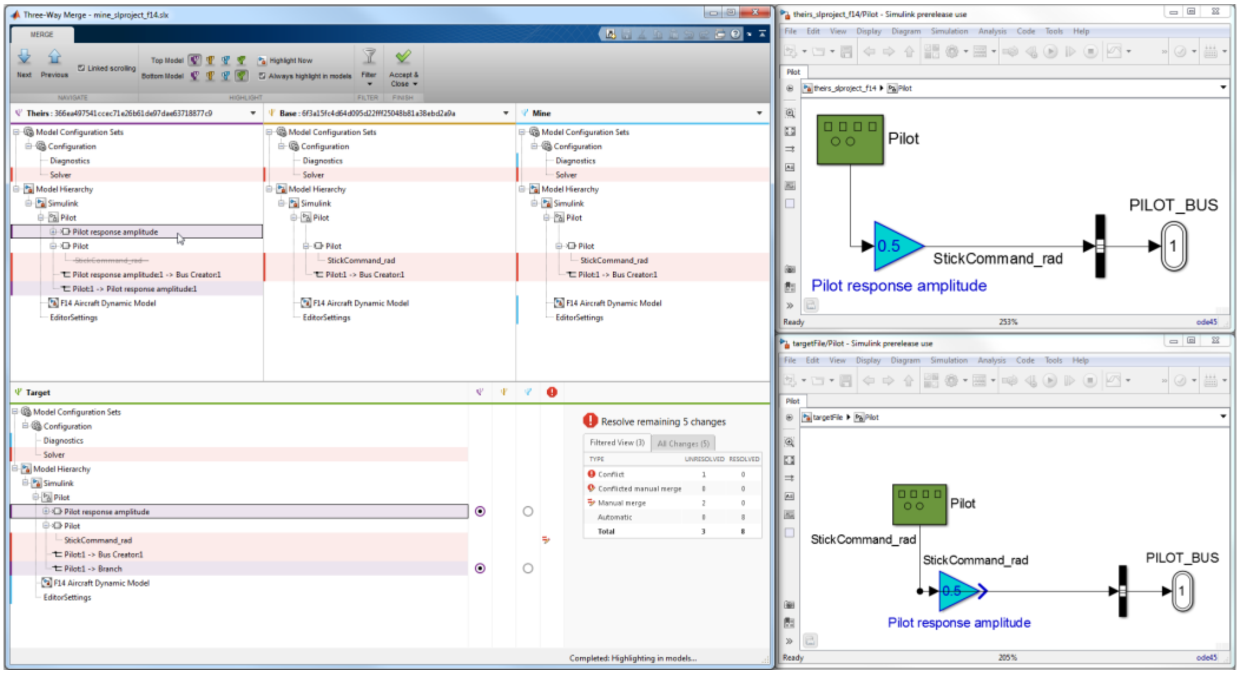
- At the top, **Theirs**, **Base**, and **Mine** columns show the differences in the conflicting revision, your revision, and the base ancestor of both files.
- Underneath, the **Target** shows the local file in your sandbox that you will merge changes into. The Merge tool already automerged the differences it can merge.



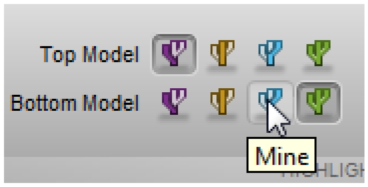
Theirs : 366ea497541ccec71e26b61de97dae63	Base : 6f3a15fc4d64d095d22fff25048b81a38eb	Mine
Model Configuration Sets	Model Configuration Sets	Model Configuration Sets
Configuration	Configuration	Configuration
Diagnostics	Diagnostics	Diagnostics
Solver	Solver	Solver
Model Hierarchy	Model Hierarchy	Model Hierarchy
Simulink	Simulink	Simulink
Pilot	Pilot	Pilot
Pilot response amplitude		
Pilot	Pilot	Pilot
~~StickCommand_rad~~	StickCommand_rad	StickCommand_rad
Pilot response amplitude:1 -> B	Pilot:1 -> Bus Creator:1	Pilot:1 -> Bus Creator:1
Pilot:1 -> Pilot response amplitu		
F14 Aircraft Dynamic Model	F14 Aircraft Dynamic Model	F14 Aircraft Dynamic Model
EditorSettings	EditorSettings	EditorSettings

2 Examine a difference by clicking **Next** or by clicking a row in the **Theirs**, **Base**, and **Mine** columns.

The merge tool displays two models (or if you selected a configuration setting, you see two model Configuration Parameters dialog boxes). By default, you see **Theirs** and **Target** models.



3 Choose the models to display with the toolstrip buttons on the **Merge** tab: **Top Model** or **Bottom Model**. View the models to help you decide what to merge.

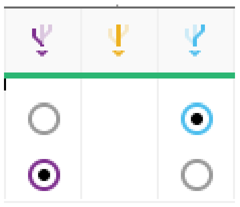


Note: If you open the merge tool using **View Conflicts**, then the models **Theirs**, **Base**, and **Mine** are temporary files showing the conflicting revisions. Examine them to decide how to merge. The **Target** model is a copy of **Mine** containing the results of your merges in the report.

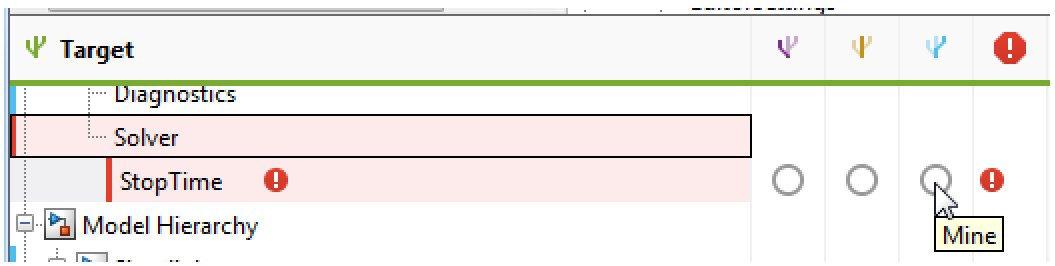
---

4 Select a version to keep for each change by clicking the buttons in the **Target** pane. You can merge modified, added, or deleted nodes, and you can merge individual

parameters. The Merge tool selects a choice for every difference it could resolve automatically. Review the selections and change them if you want.



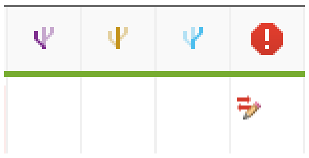
Look for warnings in the Conflicts column. Select a button to use **Theirs**, **Base**, or **Mine** for each conflicted item.



Tip Merge blocks before lines, and merge states and junctions before merging transitions. Merge tool then attempts to connect all lines to blocks for you.

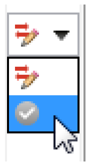
---

5 Some differences you must merge manually. In the **Target** pane, look for the manual merge icon in the Conflicts column that shows you must take action.

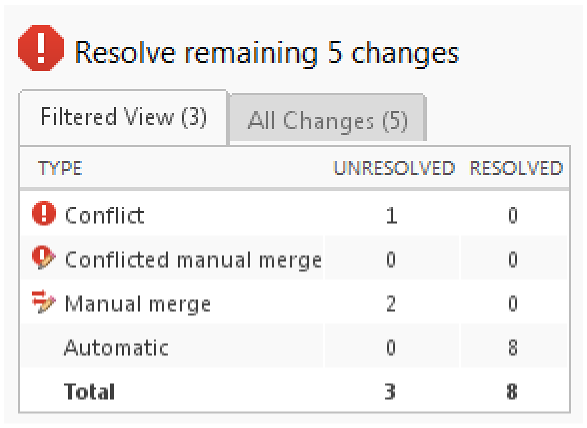


Make manual changes in the Editor. The comparison report cannot update to show any changes that you make in the Editor, so try to make manual changes after addressing all the simpler merges in the report.

After you have resolved the conflict using the Editor, in the **Target** pane, select the check option to mark the node as complete.



6 Examine the summary table to see the number of automatic merges and remaining conflicts you need to resolve.



Resolve remaining 5 changes

Filtered View (3) | All Changes (5)

TYPE	UNRESOLVED	RESOLVED
Conflict	1	0
Conflicted manual merge	0	0
Manual merge	2	0
Automatic	0	8
Total	**3**	**8**

Check for changes that are filtered out of the current view by looking at the summary table tab titles. The Filtered View and All Changes tab titles show the number of changes. By default the report hides all nonfunctional changes. Turn off active filters to view all identified changes.

7 When you are happy with your merge selections and any manual merges in the **Target** file, click **Accept and Close**. This action saves the target file with all your merges and marks the conflicted file resolved in the source control tool.

To save and not mark the conflict resolved, select **Accept and Close** > **Save and Close**.

To learn more about resolving conflicts in a change list of modified files in a Simulink project, see “Resolve Conflicts”.

Use Three-Way Merge with External Source Control Tools

If you are using source control outside of MATLAB, then you can customize external source control tools to open Three-Way Merge.

1. Configure your source control tool to call Three-Way Merge. Locate the merge settings, and add an entry to specify what to do with model files (`.slx` or `.mdl`).
2. Specify the following shell script to use as a merge tool.

   - On Windows:

     `matlbroot``\toolbox\rptgenext\slxmlcomp\slMerge.bat`
   - On Linux or Mac:

     `matlbroot``/toolbox/rptgenext/slxmlcomp/slMerge`

   Replace *`matlabroot`* with the full path to your installation.
3. After the path to the script, add arguments to specify *`base`*, *`mine`*, *`theirs`*, and *`merged`* target file, in that order. The argument names are specific to your source control tool. For example, for Tortoise SVN:

   ```
   "C:\Program files\MATLAB\R2016a\matlab\toolbox\rptgenext\slxmlcomp\slMerge.bat" %base %mine %theirs %merged
   ```

   For Perforce® P4V:

   ```
   "C:\Program files\MATLAB\R2016a\matlab\toolbox\rptgenext\slxmlcomp\slMerge.bat" %b %2 %1 %r
   ```
4. After you apply this setup, when you choose to edit conflicts in your source control tool, it opens MATLAB and Three-Way Merge. After merging, save your work, close the merge tool by clicking **Accept & Close**, and close MATLAB. When you are not using source control within MATLAB, you must manually mark conflicts resolved in your external tool.

Open Three-Way Merge Without Using Source Control

If you are not using source control or you want to choose three files to merge, then you can open Three-Way Merge using the function `slxmlcomp.slMerge`. Specify the files to merge, for example:

```
slxmlcomp.slMerge(baseFile, mineFile, theirsFile, targetFile);
```

Three-Way Merge opens, where you can merge the changes in `baseFile`, `mineFile`, and `theirsFile` into the `targetFile`.

Two-Way Model Merge

You can merge two Simulink models from an XML text comparison report. The **Compare** context menu items open a two-way model merge. If you are using source control and want to resolve conflicts using a three-way model merge instead, see "Resolve Conflicts Using Three-Way Model Merge" on page 7-21.

The merge feature enables you to merge two versions of a design modeled in Simulink. You can merge individual parameters, blocks, or entire subsystems.

Tip With the two-way merge, you can only merge from left to right. If you want to merge into the other file, use Swap Sides before you start merging. Swap Sides reverts any merges already made and creates a new comparison report for the original files.

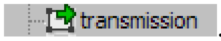
You can merge from the left model to the right model using the XML text files. You can click Undo to revert all merge operations. You can merge modified, added, or deleted nodes in the report as follows:

1. Select a report item you want to merge.
2. On the **Comparison** tab, in the **Merge** section, click **Merge Node** to merge the selected node. Merge is disabled if you cannot merge the selected node. For example, you cannot merge the top-level model nodes, data nodes, or nodes within configuration settings.

   Tip Merge blocks before lines, and merge states and junctions before merging transitions. See "Merging Tips" on page 7-28.

   ---

3. View the results in the report and the models.

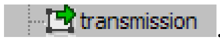
   The report merges the selected node from the left side of the report to the right. Merged report nodes have gray row highlighting, and a green merge arrow if the node has an icon, as shown on this example node: 

   .

   The merge copies the change (a modified, added, or deleted item) from the left model to the right model. If the node exists only in the left tree, then the merge inserts it into the right tree. The software attempts to connect all lines to blocks after the merge.

4 To merge individual parameters, right-click an item in the **Parameters** pane and select **Merge Left to Right**. Alternatively, click the **Merge Parameter** button in the **Merge** section of the toolstrip.

   You cannot insert or delete parameters, and not all parameters can be merged.

   If you merge all possible parameters for a node, then the report marks that node as merged, as shown on this example node: 

. If you partially merge some parameters of a node, the report marks the node as partially merged with a green merge arrow icon and no gray row highlighting.

5 (Optional) To revert all merge operations, on the **Comparison** tab, in the **Merge** section, click **Undo All**. A dialog box prompts you to confirm that you want to throw away all merge operations and revert the report and models to their original state.

6 Inspect your merge changes in the Simulink Editor. If necessary, connect any lines that the software did not connect automatically. The comparison report does not update to show any changes that you make in the Editor.

7 Save the model in the Editor or in the comparison report.

Merging Tips

- You must merge blocks before lines in the Simulink part of the report. In the Stateflow section, you must merge states and junctions before merging transitions, or the report cannot make the connections.

  For an example showing how to merge a change involving multiple nodes, see `slxml_sfcar`.
- If you want to merge subsystems, be aware that in XML text files, subsystems are represented by two nodes — the container and the contents. The two nodes have the same name but different properties. For example, name changes are a property of the container node. You can merge the container parameters and contents independently. If you want to merge a subsystem and all its properties, merge both the container and the contents nodes.
- You cannot insert or delete parameters, and not all parameters can be merged. For example, you cannot merge Simulink Identifier (`SID`) parameters.
- If you change filter settings after any merge operations, you will lose your merge changes. A dialog box prompts you to confirm that you want to throw away all merge operations and revert the report and models to their original state. If you click **Yes** to continue, the analysis runs again and you see a new report with the new filtering applied.

- For information on merging between models with identical names, see “Comparing XML Files from Models with Identical Names” on page 7-33.

Merge MATLAB Function Block Code

1. To merge differences in MATLAB Function block code, create a comparison report for the parent models.
2. (Optional) On the View tab, turn off **Highlight in Models**. Otherwise, the parent models display each time you merge a difference in the MATLAB Function block code text comparison.
3. Next to the MATLAB Function block node in the XML comparison report, click the **Compare** button.

   A new text comparison report opens.
4. In the text comparison report, select a difference in the code and click **Merge** to copy the selected difference from the left block to the right block.
5. After you finish merging differences, save the parent model in the Editor.

Related Examples

- “Resolve Conflicts with Simulink Three-Way Merge”
- “Compare Simulink Model XML Files” on page 7-8
- “Display Items in Original Models” on page 7-17
- “Source Control in Simulink Project”
- “Resolve Conflicts”
- “Compare Revisions”

Export, Print, and Save XML Comparison Results

In this section...
"Save Printable HTML Report" on page 7-30
"Export Results to the Workspace" on page 7-30
"Save Comparison Log Files in a Zip File" on page 7-31

Save Printable HTML Report

To save a printable version of an XML comparison report,

1 On the **Comparison** tab, in the **Comparison** section, select **Save As** > **HTML**, **Word**, or **Basic HTML**.

  The Save dialog box opens, where you can choose to save a printable version of the XML comparison report.

2 Select a file name and location to save the report.

The report is a noninteractive HTML document of the differences detected by the algorithm for printing, sharing, or archiving a record of the comparison. If you have applied filters, your filtered results appear in the printable report.

Export Results to the Workspace

To export the XML comparison results to the MATLAB base workspace,

1 On the **Comparison** tab, in the **Comparison** section, select **Save As** > **Workspace variable**.

  The Input Variable Name dialog box appears.

2 Specify a name for the export object in the dialog and click **OK**. This action exports the results of the XML comparison to an `xmlcomp.Edits` object in the workspace.

The `xmlcomp.Edits` object contains information about the XML comparison including file names, filters applied, and hierarchical nodes that differ between the two XML files.

To create an `xmlcomp.Edits` object at the command line without opening the Comparison Tool, enter:

```
Edits = slxmlcomp.compare(modelname_A,modelname_B)
```

Property of `xmlcomp.Edits`	Description
`Filters`	Array of filter structure arrays. Each structure has two fields, Name and Value.
`LeftFileName`	File name of left model exported to XML.
`LeftRoot`	`xmlcomp.Node` object that references the root of the left tree.
`RightFileName`	File name of right model exported to XML.
`RightRoot`	`xmlcomp.Node` object that references the root of the right tree.
`TimeSaved`	Time when results exported to the workspace.
`Version`	MathWorks release-specific version number of `xmlcomp.Edits` object.

Property of `xmlcomp.Node`	Description
`Children`	Array of `xmlcomp.Node` references to child nodes, if any.
`Edited`	Boolean — If `Edited = true` then the node is either inserted (green) or part of a modified matched pair (pink).
`Name`	Name of node.
`Parameters`	Array of parameter structure arrays. Each structure has two fields, Name and Value.
`Parent`	`xmlcomp.Node` reference to parent node, if any.
`Partner`	If matched, `Partner` is an `xmlcomp.Node` reference to the matched partner node in the other tree. Otherwise empty `[]`.

Save Comparison Log Files in a Zip File

Temporary comparison files accumulate in *`tempdir`*`/MatlabComparisons/XMLComparisons/TempDirs/`. These temporary files are deleted when you close the related comparison report.

You can zip the temporary files (such as log files) created during XML text comparisons for sharing or archiving. While the comparison report is open, enter:

```
xmlcomp.zipTempFiles('c:\work\myexportfolder')
```

The destination folder must exist. The output reports the zip file name:

```
Created the zipfile "c:\work\myexportfolder\20080915T065514w.zip"
```

To view the log file for the last comparison in the MATLAB Editor, enter:

```
xmlcomp.showLogFile
```

Comparing XML Files from Models with Identical Names

You can compare XML text from files of the same name. To complete the operation, the XML comparison tool copies one of the models to a temporary folder, because Simulink cannot have two models of the same name in memory at the same time. The XML comparison tool creates a read-only copy of one model named `*modelname*_TEMPORARY_COPY`, and compares the resulting XML files.

Warning When you use reverse annotation from the report, one of the models displayed is a temporary copy with a new name. The temporary copy is read-only, to avoid making changes that can be lost.

Alternatively, you can run the comparison by renaming or copying one of the files.

All *merge* operations merge from left to right, so you cannot accidentally merge to a temporary copy. Merge operations on models with identical names copy changes from the left (temporary copy) model to the right model. If you swap sides, the report always places a new temporary copy on the left side of the report, so any merges change the original model file and never a temporary copy.

If one of the models is open when you try to compare XML files, a dialog box appears where you can click **Yes** to close the file and proceed, or **No** to abort. You must close open models before the XML comparison tool can compare XML files from two models with the same name. The problem requiring you to close the loaded model is called "shadowed files". In some cases, another model with the same name might be in memory, but not visible. See "Shadowed Files" in the Simulink documentation for more information.

If you want to automatically close open models of the same name when comparing XML files and not see the dialog box again, run these commands:

```
opt = slxmlcomp.options
opt.setCloseSameNameModel(true)
```

This is persistent across MATLAB sessions. To revert to default behavior and be prompted whether or not to close the open model every time, enter:

```
opt = slxmlcomp.options
opt.setCloseSameNameModel(false)
```

Work with Referenced Models and Library Links

The XML comparison report applies only to the currently selected models, and does not include changes to any referenced models or linked libraries. For compatibility with source control and peer review workflows, the comparison report shows only changes in the files selected for comparison.

Tip If you want to examine your whole hierarchy instead, try using a Simulink Project, where you can examine modified files and dependencies across your whole project, and compare to selected revisions. See “Project Management”.

If you are comparing models that contain referenced models with the same name, then your MATLAB path can affect the results. For example, this can happen if you generate an XML comparison report for the current version of your model and a previous baseline. Make sure that your referenced models are not on your MATLAB path before you generate the report.

The reason why results can change is that Simulink records information in the top model about the interface between the top model and the child model. This interface information in the top model enables incremental loading and diagnostic checks without any need to load child models.

When you load a model (for example, to compare XML) then Simulink refreshes the interface information for referenced models if it can find the child model. Simulink can locate the child model if it is on the path. If another model of the same name is higher on the path, Simulink updates the interface information for that other model before comparing XML. This can produce entries for interface changes for model reference blocks in the comparison report. Make sure your referenced models are not on your path before you generate the report, to avoid these interface changes in the results. If both model versions are off the path, the interface information in the top model is not refreshed during the XML comparison process. Instead the cached information is used, resulting in a valid XML comparison report.

With library links, Simulink does not update the cached interface information when comparing XML, and so the report correctly captures library interfaces. However with both referenced models and library links, Simulink updates the information when displaying the model. When displaying report items in original models, you may see that Simulink finds another model or library that is higher in the path. To obtain the clearest results, make sure that the models and associated libraries are temporarily removed from the path. By removing the files from the path you will see unresolved library links and referenced models when you view the original models, but their interfaces will be correct and will correctly align with the comparison report.

Compare XML from Models Managed with Subversion

In this section...

Work with Subversion

Simulink Projects provide built-in Subversion source control integration. You can create an XML comparison report from the Modified Files view of the Simulink Project Tool. See "Project Management".

Alternatively, you can customize your external Configuration Management tools to call the XML comparison functionality in the Simulink Report Generator, as described on this page.

Comparing two versions of the same file is a common workflow when using Configuration Management tools. If your Configuration Management tool is configurable, you can customize your *Diff* operations on Simulink model files from your Configuration Management tool to call the XML comparison functionality in the Simulink Report Generator. This allows you to compare two versions of the XML from the same model file and generate a report of the differences.

TortoiseSVN and Subversion are a popular suite of open-source version control tools. The following example describes how to configure TortoiseSVN to use the Simulink Report Generator XML comparison. You can register the XML comparison function with TortoiseSVN as an extension-specific diff program to use for model files. When you perform a TortoiseSVN diff on a model file, TortoiseSVN uses the XML comparison to generate a report. This workflow describes a typical usage of Subversion on a Windows PC.

1. Configure TortoiseSVN to use the `fileComparisonDriver` function for model files.
2. When you perform a TortoiseSVN diff on a model file, the `fileComparisonDriver` function invokes the `visdiff` function to generate an XML comparison report.

Optionally, you can also configure TortoiseSVN to use the same function to call the Comparison Tool for `.mat` files and for Simulink manifest files (`.smf` files).

Configure TortoiseSVN

This example is compatible with Release 2008b+ onwards and was tested with Subversion 1.7.7 on Windows 7 Enterprise.

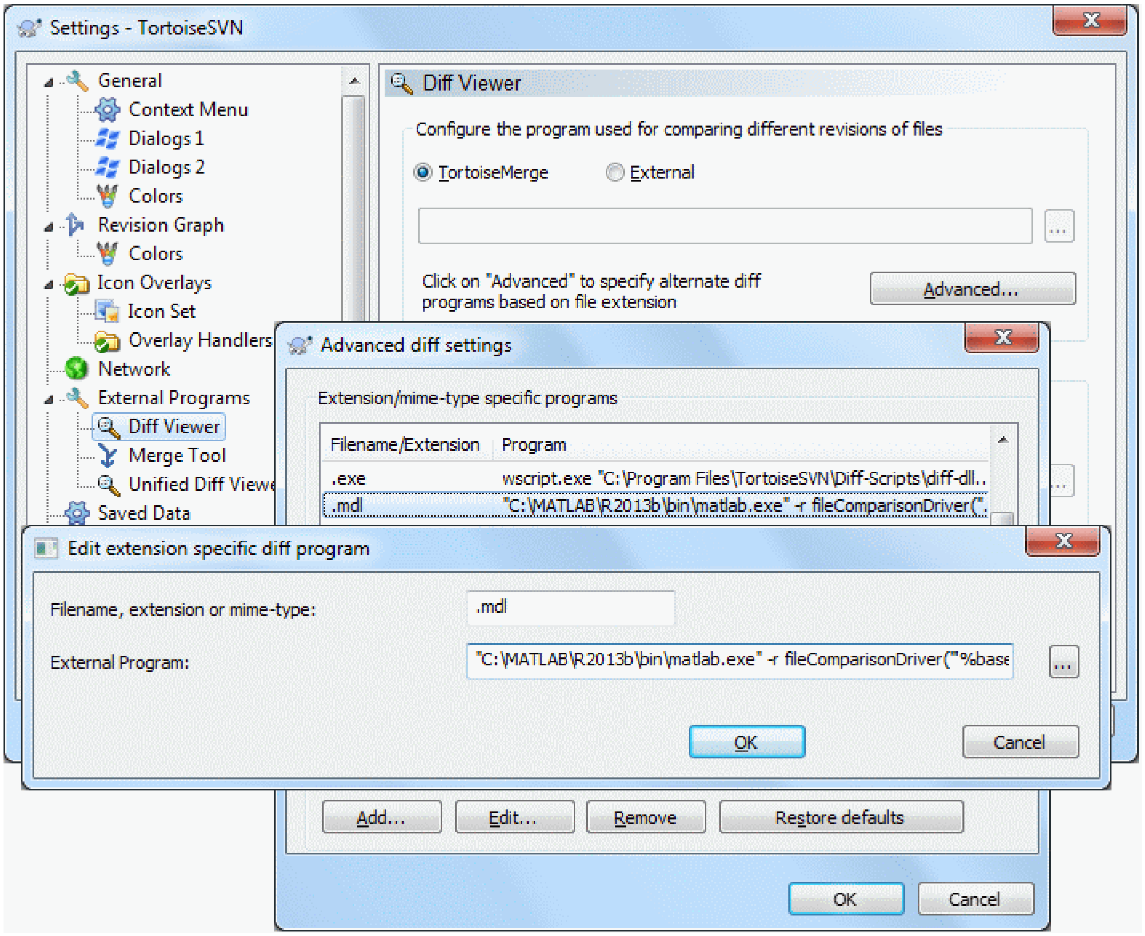
Configure TortoiseSVN to use the XML comparison tool for model files, as follows:

1. Right-click a file in Windows Explorer and select **TortoiseSVN** > **Settings**.
2. In the TortoiseSVN Settings dialog box, click **Diff Viewer** under **External Programs** in the tree, then click the **Advanced** button.
3. In the Advanced Diff settings dialog box, add an entry to specify what to do with model files by clicking **Add**.
4. In the Add extension specific diff program dialog box, enter `.mdl` or `.slx` for the **Extension** and enter the following command in the **External Program** edit box:

   ```
   "matlabroot\bin\matlab.exe" -r fileComparisonDriver("'%base'","'%mine'") -nosplash
   ```

   Replace *`matlabroot`* with the path to the specific location on your computer for your MATLAB installation, for example, `C:\Program files\MATLAB\R2009a`.

   The following example shows this setup on an R2013b installation.



Configure the program used for comparing different revisions of files

TortoiseMerge [✓] External

Click on "Advanced" to specify alternate diff programs based on file extension

Extension/mime-type specific programs

Filename/Extension	Program
.exe	wscript.exe "C:\Program Files\TortoiseSVN\Diff-Scripts\diff-dll..
.mdl	"C:\MATLAB\R2013b\bin\matlab.exe" -r fileComparisonDriver(".

Filename, extension or mime-type: .mdl

External Program: "C:\MATLAB\R2013b\bin\matlab.exe" -r fileComparisonDriver(""%base

5 Click **OK** to apply your changes and close all the Tortoise SVN dialog boxes.

6 If you also want to use the MATLAB Comparison Tool to compare MATLAB files, such as `.m` and `.mat` files, or Simulink manifest files (`.smf` files) you can repeat the steps to add exactly the same **External Program** command for `.m`, `.mat` and `.smf` files.

Test TortoiseSVN Setup

To test your setup, follow these steps:

1. Start MATLAB and open, modify, and save a Simulink model that is managed in a Subversion archive. This creates a local working copy that is different to the head repository copy.
2. In Windows Explorer, right-click your modified file, and select **TortoiseSVN** > **Diff**.

TortoiseSVN runs a new instance of MATLAB. MATLAB loads and runs the `fileComparisonDriver.m` file, located in the folder `matlab\toolbox\rptgenext\rptgenextdemos\slxmlcomp`. The `fileComparisonDriver` function performs these steps:

1. Creates temporary copies of the current working version of the Simulink model and the previously stored version of the model.
2. Compares the XML text files from both models and generates a comparison report displayed in the MATLAB Comparison Tool.

The function must preprocess the file names by creating renamed temporary copies because Subversion uses a temporary file naming convention that is not compatible with Simulink because of invalid delimiting characters. The branch and version information is embedded in the temporary model names. See also “Comparing XML Files from Models with Identical Names” on page 7-33 for information about using the report and a warning to avoid losing work in the temporary models.

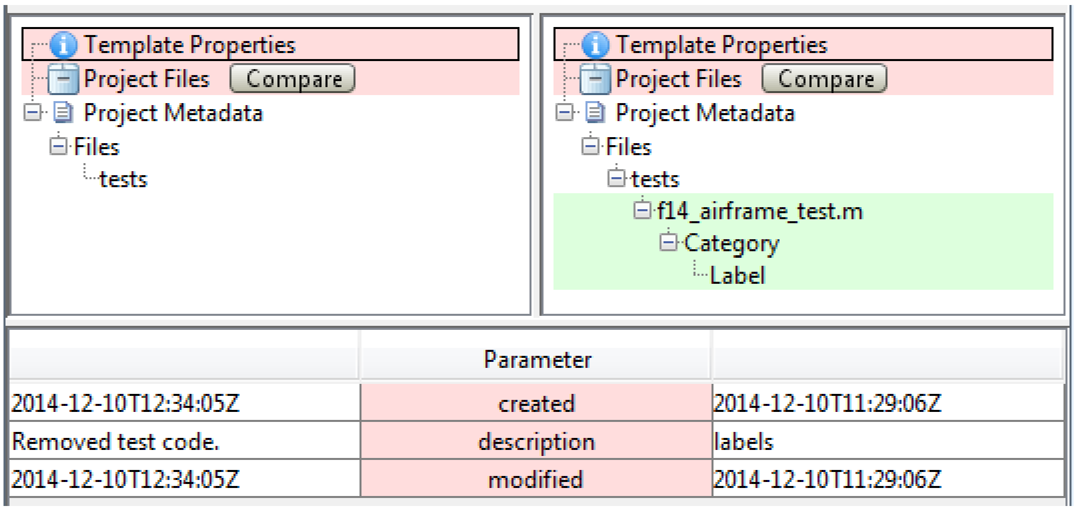
Other TortoiseSVN workflows using Diff operations are also supported, such as comparing two versions in an archive.

Compare Templates

In this section...
"Compare Project Templates" on page 7-40
"Compare Model Templates" on page 7-41

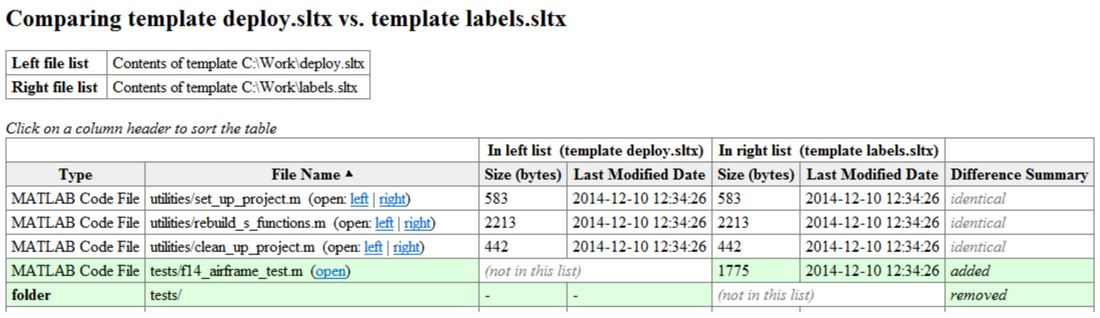
Compare Project Templates

You can compare project templates (SLTX files). If you select two project template files to compare, you see a comparison report showing differences in template properties and project metadata. You can open a new report to investigate project file and folder differences.



	Parameter	
2014-12-10T12:34:05Z	created	2014-12-10T11:29:06Z
Removed test code.	description	labels
2014-12-10T12:34:05Z	modified	2014-12-10T11:29:06Z

- Click **Template Properties** to view differences in the Parameters, such as the description or date modified.
- Expand the **Project Metadata** node to view metadata differences such as label changes.
- Next to **Project Files**, click **Compare** to open a folder comparison where you can investigate changed, added, or removed files and folders.



Comparing template deploy.sltx vs. template labels.sltx

Left file list	Contents of template C:\Work\deploy.sltx
Right file list	Contents of template C:\Work\labels.sltx

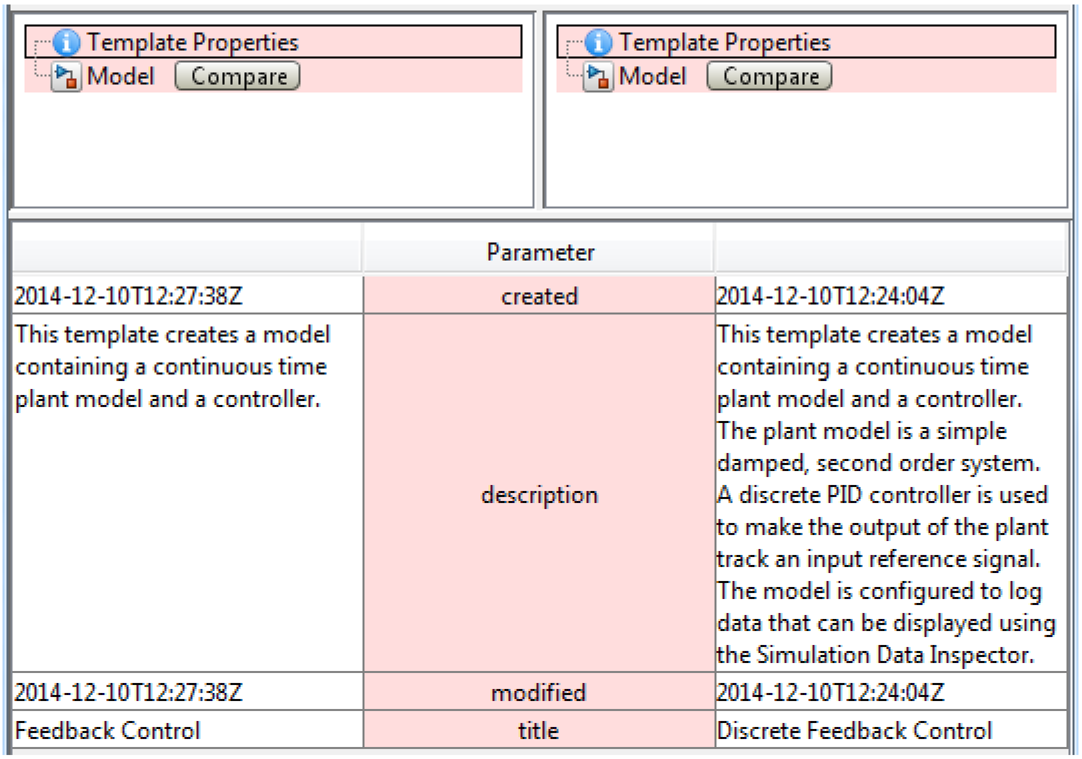
Click on a column header to sort the table

		In left list (template deploy.sltx)		**In right list (template labels.sltx)**		
Type	**File Name ▲**	**Size (bytes)**	**Last Modified Date**	**Size (bytes)**	**Last Modified Date**	**Difference Summary**
MATLAB Code File	utilities/set_up_project.m (open: left | right)	583	2014-12-10 12:34:26	583	2014-12-10 12:34:26	*identical*
MATLAB Code File	utilities/rebuild_s_functions.m (open: left | right)	2213	2014-12-10 12:34:26	2213	2014-12-10 12:34:26	*identical*
MATLAB Code File	utilities/clean_up_project.m (open: left | right)	442	2014-12-10 12:34:26	442	2014-12-10 12:34:26	*identical*
MATLAB Code File	tests/f14_airframe_test.m (open)	*(not in this list)*		1775	2014-12-10 12:34:26	*added*
folder	tests/	-	-	*(not in this list)*		*removed*

Compare Model Templates

You can compare model templates (SLTX files). If you select two model template files to compare, you see a comparison report showing differences in template properties. You can open a new comparison report to compare XML text files from the Simulink models.

- Click **Template Properties** to view differences in the Parameters, such as the description or date modified.
- Next to **Model**, click **Compare** to open a Simulink model XML comparison report where you can investigate differences.



	Parameter	
2014-12-10T12:27:38Z	created	2014-12-10T12:24:04Z
This template creates a model containing a continuous time plant model and a controller.	description	This template creates a model containing a continuous time plant model and a controller. The plant model is a simple damped, second order system. A discrete PID controller is used to make the output of the plant track an input reference signal. The model is configured to log data that can be displayed using the Simulation Data Inspector.
2014-12-10T12:27:38Z	modified	2014-12-10T12:24:04Z
Feedback Control	title	Discrete Feedback Control

Related Examples

- "Compare Simulink Model XML Files" on page 7-8
- "Comparing Folders and Zip Files"
- "Create a Template from the Current Project"
- "Create a Template from a Model"

Components — Alphabetical List

For a list of MATLAB Report Generator components, see the MATLAB Report Generator documentation.

Annotation Loop

Run child components multiple times for each Simulink annotation in current context

Description

This component runs its child components multiple times for each Simulink annotation in the current context. The parent component determines the context.

- `Model Loop`: Reports on all annotations inside the reported portion of the reported model.
- `System Loop`: Reports on all annotations inside the current system.
- `Block Loop` or `Signal Loop`: Does nothing.

Loop Options

The Loop Options pane displays information about the current context. You can sort `Alphabetically by text` or `In traversal order`.

Child components of the `Annotation Loop` consider their context to be annotations when the report is running.

For example, the following components report on the looped annotation:

- `Simulink Automatic Table`
- `Simulink Linking Anchor`
- `Simulink Name`
- `Simulink Property`
- `Simulink Property Table`

Use a Summary Table component to show annotation objects in reports. Each Summary Table component creates a single table with each reported annotation on a single row of the table.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to each object in the loop, the generated report.

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `System Loop`, `Simulink Linking Anchor`, `Simulink Name`, `Simulink Property`, `Simulink Property Table`, `Simulink Summary Table`

Block Execution Order List

Create a list or table of all nonvirtual blocks in the model, showing order in which they execute

Description

This component creates a list or table of all nonvirtual blocks in the model, showing the order in which they execute.

For more information about virtual and nonvirtual blocks, see “Nonvirtual and Virtual Blocks” in the Simulink documentation.

Properties

- **List Title**:
  - `Automatic`: Generates a list or table title automatically.
  - `Custom`: Enables you to enter a title.
- **Include block type information**: Include each block's `BlockType` property in the list or table.

- **Look under nonvirtual subsystems**: The default is `Automatic (On for models, Off for systems)`. Set it to `On` or `Off`.

Insert Anything into Report?

Yes. List.

Class

`rptgen_sl.csl_blk_sort_list`

See Also

`Block Loop`

Block Loop

Run child components for each block in the current system, model, or signal

Description

This component runs its child components for each block contained in the current system, model, or signal.

For conditional processing based of blocks, you can use the `RptgenSL.getReportedBlock` function. For more information, see "Loop Context Functions" on page 6-24.

Report On

This pane describes the type of object on which this component operates.

- **Automatic list from context**: Report on all blocks in the current context. The parent component of the Block Loop determines its context. If this component does not have the `Model Loop`, `System Loop`, `Signal Loop`, or `Block Loop` as its parent, selecting this option causes this component to report on all blocks in all models.
  - `Model Loop`: Reports on all blocks in the current model.
  - `System Loop`: Reports on all blocks in the current system.
  - `Signal Loop`: Reports on all blocks connected to the current signal.
- **Custom - use block list**: Enables you to specify a list of blocks on which to report. Enter the full path of each block.

Loop Options

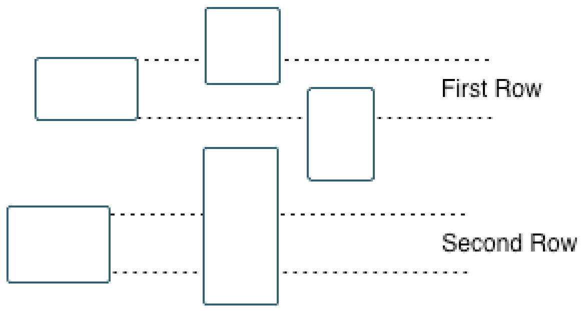
Choose block sorting options and reporting options in this pane.

- **Sort blocks**:

  Use this option to select how to sort blocks (applied to each level in a model):

  - `Alphabetically by block name`. Sorts blocks alphabetically by their names.

- `Alphabetically by system name`. Sorts systems alphabetically. The report lists blocks in each system, but in no particular order.
- `Alphabetically by full Simulink path`. Sorts blocks alphabetically by Simulink path.
- `By block type`. Sorts blocks alphabetically by block type.
- `By block depth`. Sorts blocks by their depth in the model.
- `By layout (left to right)`: Sorts blocks by their location in the model layout, by *rows*. The block appearing the furthest toward the left top corner of the model is the anchor for the row. The row contains all other blocks that overlap the horizontal area defined by the top and bottom edges of the anchor block. The other rows use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.



- `By layout (top to bottom)`: Sorts blocks by their location in the model layout, by *columns*. The block appearing the furthest toward the left top corner of the model is the anchor for the column. The column contains all other blocks that overlap the vertical area defined by the left and right edges of the anchor block. The other columns use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.
- `By traversal order`. Sorts blocks by traversal order.
- `By simulation order`. Sorts blocks by execution order.
- `%<VariableName>`: Inserts the value of a variable from the MATLAB workspace. The `%<>` notation can denote a string or cell array. The following example reports on the `theta dot` integrator block and the `theta` integrator block in the model `simppend`, using the variable `Z={ 'simppend/theta'}`:

```
simppend/theta dot
%<Z>
```

The generated report includes information about the following blocks:

- `simppend/theta dot`
- `simppend/theta`

For more information, see `%<VariableName> Notation` on the `Text` component reference page in the MATLAB Report Generator documentation.

- **Search for Simulink property name/property value pairs**: Reports only on Simulink blocks with specified property name/property value pairs.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each block found in the loop.
- **Display the object type in the section title**: Automatically inserts the object type into the section title in the generated report.
- **Create link anchor for each object in loop**: Create a hyperlink to the block in the generated report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`rptgen_sl.csl_blk_loop`

See Also

`Model Loop`, `Signal Loop`, `System Loop`, `Simulink Linking Anchor`, `Simulink Name`, `Simulink Property`, `Simulink Property Table`, `Simulink Summary Table`

Block Type Count

Count number of each block type in the current model or system

Description

This component counts the number of each block type in the current model or system. Within a model, this component counts blocks underneath masks and inside library links.

For more information about block types, see “Nonvirtual and Virtual Blocks” in the Simulink documentation.

Count Types

The parent of this component determines where to count block types:

- `Model Loop`: Reports all block types in the current model:
  - `All blocks in model`: Counts block types in the entire model.
  - `All blocks in reported systems`: Counts block types only in systems that appear in the report.
- `System Loop`: Reports all block types in the current system.

Table Content

- **Table title**: Allows you to enter the table title.
- **Show block names in table**: Includes a column that displays all block names in the table.
- **Sort table**:
  - `Alphabetically by block type`: Sorts blocks alphabetically by block type.
  - `By number of blocks`: Sorts by decreasing number of occurrences.
- **Show total count**: Displays total number of block types.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sl.csl_blk_count`

See Also

`Block Loop`, `Model Loop`, `System Loop`

Bus

Create list of signals exiting from `Bus Selector` block

Description

This component creates a list of signals exiting a `Bus Selector` block. The list contains signals leaving from the reported block or downstream buses and signals.

The parent of this component determines which buses appear in the report:

- `Model Loop`: Includes all buses in the current model.
- `System Loop`: Includes all buses in the current system.
- `Block Loop` : If the current block is a bus block, then the report includes that block.
- `Signal Loop`: Includes all buses connected to the current signal.

If the Bus component does not have a looping component as its parent, it reports on all buses in all open models.

Properties

- **Show Bus Hierarchy**: Specifies whether the list displays downstream buses hierarchically.
- **Insert linking anchor for bus blocks**: Inserts a linking anchor for each bus block. This property designates the list item as the location to which other links for that block point. (For more information, see the `Simulink Linking Anchor` or `Link` component reference pages.) Do not use this option if you have already specified an anchor location for the bus block with an `Object Linking Anchor` component.
- **Insert linking anchor for signals**: Inserts a linking anchor for each signal. This property designates the list item as the location to which other links for that signal point. For more information, see the `Simulink Linking Anchor` or `Link` component reference pages.) Do not use this option if you have already specified an anchor location for the signal with an `Object Linking Anchor` component.

- **Title**: Inserts a title before each list. This attribute supports the `%<varname>` notation. For more information, see `%<VariableName> Notation` on the `Text` component reference page in the MATLAB Report Generator documentation.

Insert Anything into Report?

Yes. List.

Class

`rptgen_sl.csl_blk_bus`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `Simulink Linking Anchor`, `System Loop`,

Chart Loop

Run child components for specified Stateflow charts

Description

This component runs its children for specified Stateflow charts.

For conditional processing for a chart, you can use the `RptgenSF.getReportedChart` function. For more information, see “Loop Context Functions” on page 6-24.

Report On

- **Automatic list from context**: Report on all chart blocks in the context set by the parent of this component.
  - `Model Loop`: Reports on all Stateflow chart blocks in the current model.
  - `System Loop`: Reports on all Stateflow chart blocks in the current system.
  - `Signal Loop`: Reports on all Stateflow chart blocks connected to the current signal.
  - `Machine Loop`: Reports on the current block if it is in a Stateflow chart.

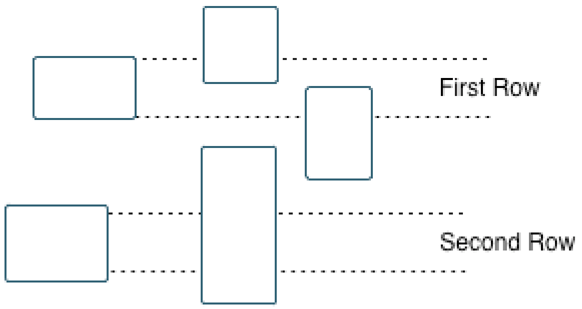
  If the `Chart Loop` component has any other type of component as its parent, selecting this option causes it to report on all Stateflow chart blocks.
- **Custom - use block list**: Reports on a specified list of Stateflow chart blocks.

Loop Options

Choose chart block sorting options and reporting options in this pane.

- **Sort blocks**: Specifies how to sort blocks (applied to each level in a model). This option is available if you select `Automatic list from context` in the **Report On** section, or if you select `Custom - use block list` and the `Sort blocks` option.
  - `Alphabetically by block name`. Sorts blocks alphabetically by name.
  - `Alphabetically by system name`. Sorts systems alphabetically by name. Lists blocks in each system, but in no particular order.

  - `Alphabetically by full Simulink path`. Sorts models alphabetically by their full paths.
  - `By block type`. Sorts blocks alphabetically by block type.
  - `By depth`. Sorts blocks by their depth in the model.
  - `By layout (left to right)`: Sorts blocks by their location in the model layout, by *rows*. The block appearing the furthest toward the left top corner of the model is the anchor for the row. The row contains all other blocks that overlap the horizontal area defined by the top and bottom edges of the anchor block. The other rows use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.



  - `By layout (top to bottom)`: Sorts blocks by their location in the model layout, by *columns*. The block appearing the furthest toward the left top corner of the model is the anchor for the column. The column contains all other blocks that overlap the vertical area defined by the left and right edges of the anchor block. The other columns use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.
  - `By simulation order`. Sorts blocks by execution order.
  - `%<VariableName>`: Inserts the value of a variable from the MATLAB workspace. The `%<>` notation can denote a string or cell array. For more information, see `%<VariableName> Notation` on the `Text` component reference page in the MATLAB Report Generator documentation.
- **Search for Simulink property name/property value pairs**: Reports on Simulink blocks with specified property name/property value pairs.
- **Search Stateflow**: Reports on Stateflow charts with specified property name/ property value pairs.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`rptgen_sf.csf_chart_loop`

See Also

`Block Loop`, `Machine Loop`, `Model Loop`, `Signal Loop`, `System Loop`, `Simulink Function System Loop`

Code Generation Summary

Insert version number information, list of generated files, tables summarizing code generation configuration information, and subsystem maps into report

Description

This component reports the following information:

- Version number information
- List of generated files
- Code generation configuration information
- Subsystem map

Summary

- **General information**: Includes the following information in the report:
  - Model name and version
  - Simulink Coder version number
  - List of full paths of generated files
- **Configuration settings**: Includes tables that list optimization and Simulink Coder target selection and build process Configuration Parameter settings.
- **Subsystem map**: Includes in the report a unique mapping between subsystem numbers and subsystem labels in the model.

Traceability Report

Use settings from model: When you select this option, the report uses all of the following configuration settings, as specified in your model. Deselecting this option allows you to turn off one or more of these settings as needed:

- **Eliminated/virtual blocks**
- **Traceable blocks**

- **Traceable StateFlow Objects**
- **Traceable MATLAB Function Blocks**

For more information on these configuration settings, see “Code Generation Pane: Report” in the Simulink Coder documentation.

Insert Anything into Report?

Yes. Tables and list.

Class

`RptgenRTW.CCodeGenSummary`

See Also

`Import Generated Code`

Documentation

Insert text extracted from `DocBlock` blocks in Simulink models

Description

This component inserts text extracted from `DocBlock` blocks in Simulink models. It can have the following components as its parent:

- `Model Loop`
- `System Loop`
- `Block Loop`

The specified report format determines the format of the `DocBlock` block data inserted into the report:

- `HTML`: Imports HTML data into the report.

  Note: For non-English HTML DocBlock text that you want to include in a Documentation component, use UTF-8 file encoding. Use a simple text editor to create the HTML code.

- `RTF`: Imports RTF data into the report.

Properties

- **Import file as**: Specifies how to format the imported information. The following example shows how each option works, using the following text as input:

  ```
  First row.
    Second row.

  Third row follows blank line.
  ```

  - `Plain text (ignore line breaks)`. Imports plain text without any line breaks (no paragraphs), as in this example:

    ```
    First row. Second row. Third row follows blank line.
    ```

- `Paragraphs defined by line breaks`. Imports the text contained in paragraphs defined by line breaks (hard returns or carriage returns), as in this example:

  ```
  First row.
  Second row.

  Third row follows blank line.
  ```

- `Paragraphs defined by empty rows`. Imports text contained in paragraphs defined by empty rows (rows that do not contain text), as in this example:

  ```
  First row. Second row.

  Third row follows blank line.
  ```

- `Text (retain line breaks)`. Imports plain text, including line breaks, as in this example:

  ```
  First row.
  Second row.

  Third row follows blank line.
  ```

- `Fixed-width text (retain line breaks)`. Imports fixed-width text (all letters have the same width or size) including line breaks, as in this example:

  ```
  First row.
    Second row.

  Third row follows blank line.
  ```

  Tip This option is useful for importing MATLAB files.

- **Insert linking anchor for blocks**: Inserts a linking anchor for each `DocBlock` block that designates the location where other links for that block point. (See the `Simulink Linking Anchor` or `Link` component reference pages for more help.) Do not use this option if you have already specified an anchor location for a `DocBlock` block with an `Object Linking Anchor` component.

Insert Anything into Report?

Yes. Text, paragraph, or external RTF/HTML data.

Class

`rptgen_sl.csl_blk_doc`

See Also

`Block Loop`, `Model Loop`, `Simulink Linking Anchor`, `System Loop`

Fixed Point Block Loop

Run child components for the Simulink model, system, or signal defined by parent component

Description

This component runs its children for the Simulink model, system, or signal that its parent defines. Options for the parent component are:

- `Model Loop`
- `System Loop`
- `Signal Loop`

Report On

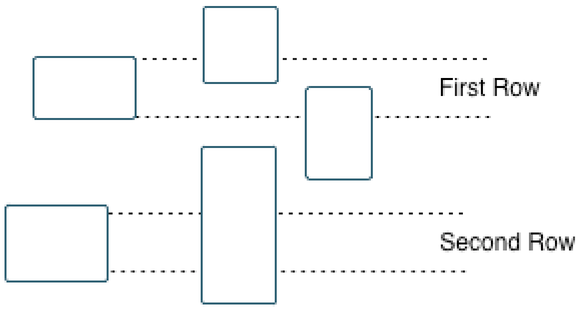
- **Automatic list from context**: Reports on all fixed-point blocks in the context of the parent of this component. For example, if the parent component is the `System Loop`, then this component reports on all fixed-point blocks in the current system. If this component does not have a looping component as its parent, then selecting this option causes the component to report on all fixed-point blocks in all models.
- **Custom - use block list:**: Reports on a specified list of blocks.

Loop Options

Choose block sorting options and reporting options in this pane.

- **Sort blocks**: Specifies how to sort blocks (applied to each level in a model). This option is available if you select the `Automatic list from context` option in the **Report On** section, or if you select `Custom - use block list` and the `Sort blocks` options.
  - `Alphabetically by block name`. Sorts blocks alphabetically by name.
  - `Alphabetically by system name`. Sorts systems alphabetically. Lists blocks in each system, but in no particular order.

  - `Alphabetically by full Simulink path`. Sorts blocks alphabetically by Simulink path.
  - `By block type`. Sorts blocks alphabetically by block type.
  - `By block depth`. Sorts blocks by their depth in the model.
  - `By layout (left to right)`: Sorts blocks by their location in the model layout, by *rows*. The block appearing the furthest toward the left top corner of the model is the anchor for the row. The row contains all other blocks that overlap the horizontal area defined by the top and bottom edges of the anchor block. The other rows use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.



  - `By layout (top to bottom)`: Sorts blocks by their location in the model layout, by *columns*. The block appearing the furthest toward the left top corner of the model is the anchor for the column. The column contains all other blocks that overlap the vertical area defined by the left and right edges of the anchor block. The other columns use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.
  - `By traversal order`. Sorts blocks by traversal order.
  - `By simulation order`. Sorts blocks by execution order.
  - `%<VariableName>`: Inserts the value of a variable from the MATLAB workspace. For more information, see `%<VariableName> Notation` on the `Text` component reference page in the MATLAB Report Generator documentation.
- **Search for Simulink name/property value pairs**: Reports only on blocks with the specified property name/property value pairs. To enable searching, click the check box. In the first row of the property name and property value table, click inside the

edit box, delete the existing text, and type the property name and value. To add a row, use the **Add row** button

For information about subsystem property names and values, in “Block-Specific Parameters”, see the “Ports & Subsystems Library Block Parameters” section.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`rptgen_fp.cfp_blk_loop`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `Simulink Linking Anchor`, `System Loop`

Fixed Point Logging Options

Set fixed-point options like in Fixed Point Tool

Description

This component sets fixed-point options like those set in the Fixed Point Tool (invoked by running the `fxptdlg` function).

This component must be a child of the `Model Loop` component. Use this component to set the following options on the current model:

- Data type override
- Fixed-point instrument mode
- Logging type

This component can have child components. It is a good practice to use this component with a `Model Simulation` component as its child. This approach sets fixed-point properties for the model for the purpose of the simulation, and then restores them to their original values after the simulation is complete.

Data Type Override

- **Use local settings**: Overrides data types according to the value of this parameter set for each subsystem. Otherwise, settings for parent systems override those of child systems.
- **Scaled double**: Overrides the output data type of all blocks in the current system or subsystem with doubles. However, this option maintains the scaling and bias specified in the mask of each block.
- **Doubles**: Overrides the output data type of all blocks in the current system or subsystem with doubles. The overridden values have no scaling or bias.
- **Singles**: Overrides the output data type of all blocks in the current system or subsystem with singles. The overridden values have no scaling or bias.
- **Off**: Does not perform any data type override on any block in the current system or subsystem.

Fixed-Point Instrumentation Mode

Specify logging options in this section. For logged blocks, minimum and maximum simulation values are written to the workspace.

- **Use local settings**: Logs data according to the value of this parameter set for each subsystem. Otherwise, settings for parent systems always override those of child systems.
- **Min, max, and overflow**: Logs minimum value, maximum value, and overflow data for all blocks in the current system or subsystem.
- **Overflow only**: Logs only overflow data for all blocks in the current system or subsystem.
- **Force off**: Logs no data for any block in the current system or subsystem. Use this selection to work with models containing fixed point-enabled blocks, if you do not have a Fixed-Point Designer license.

For more information on logging simulation results, see “Propose Fraction Lengths Using Simulation Range Data” in the Fixed-Point Designer documentation.

Logging Type

Specify how to record logs in this section:

- **Overwrite log**: Clears information in the logs before new logging data is entered.
- **Merge log**: Merges new logging data with previously logged information.

Insert Anything into Report?

No.

Class

`rptgen_fp.cfp_options`

See Also

`Model Simulation`

Fixed Point Property Table

Insert table that reports on Fixed-Point Designer block property name/property value pairs

Description

This component inserts a table that reports on Fixed-Point Designer block property name/property value pairs.

Table

Select a preset table, which is already formatted and configured, in the **preset table** list in the upper-left corner of the attributes page.

- **preset table**

  Specifies the type of object property table.

  - `Default`
  - `Mask properties`
  - `Block limits`
  - `Out-of-range errors`
  - `All fixed-point properties`
  - `Blank 4x4`

  To apply the specified table, select the table and click **Apply**.
- **Split property/value cells**: Split property name/property value pairs into separate cells. For the property name and property value to appear in adjacent horizontal cells in the table, select the **Split property/value cells** check box. In this case, the table is in split mode, so there only one property name/property value pair can exist in a cell. If there is more than one name/property pair in a cell, only the first pair appears in the report. The report ignores all subsequent pairs.

  For the property name and property value to appear together in one cell, clear the **Split property/value cells** check box. That option specifies nonsplit mode. Nonsplit mode supports more than one property name/property value pair and text.

Before switching from nonsplit mode to split mode, make sure that there is only one property name/property value pair per table cell. If you have more than one property name/property value pair or text in one cell, only the first value pair appears in the report. Subsequent pairs and text are omitted.

- **Display outer border**: Display the outer border of the table in the generated report.

Table Cells

Select table properties to modify. The selection in this pane affects the available fields in the **Cell Properties** pane.

Cell Properties

- **Contents**

  Modify the contents of the table cell selected in the **Table Cells** pane.
- **Show as**: Specifies the format for the contents of the table cell.
  - `PROPERTY Value`
  - `Value`
  - `Property Value`
  - `Property: Value`
  - `PROPERTY: Value`
  - `Property - Value`
  - `PROPERTY - Value`
- **Alignment**: Aligns the contents of the table cell.
  - `Center`
  - `Left`
  - `Right`
  - `Double justified`
- **Lower border**: Displays the lower border of the table in the generated report.
- **Right border**: Displays the right border of the table in the generated report.

Creating Custom Tables

To create a custom table, edit a preset table, such as the `Blank 4x4` table. Add and delete rows and add properties. To open the Edit Table dialog box, click **Edit**.

For details about creating custom property tables, see “Property Table Components” on page 6-6.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_fp.cfp_prop_table`

See Also

`Fixed Point Summary Table`

Fixed Point Summary Table

Table of specified fixed-point block properties or parameters

Description

This component displays properties or parameters of specified fixed-point blocks in a table.

Properties

Table title

Choose a table title in the generated report:

- `Automatic`: Generates a title automatically from the parameter.
- `Custom`: Specifies a custom title.

Property Columns

Property name

This field displays the object properties to include in the Summary Table in the generated report.

- To add a property:

  1. Select the appropriate property level in the menu
  2. Select the property to add from the selection list and click **Add**.
- To delete a property, select the property name and click the **Delete** button.
- To move properties up and down in the list, click the **Up** and **Down** buttons.

Note: Some entries in the list of available properties (such as `Depth`) are “virtual” properties that you cannot access using the `get_param` command. The properties used for property/value filtering in the block and system loop components must be retrievable by the `get_param`. Therefore, you cannot configure your Summary Table to report on all blocks of `Depth` == 2.

Transpose table

Enabling this check box changes the summary table rows into columns in the generated report, putting the property names in the first column and the values in the other columns.

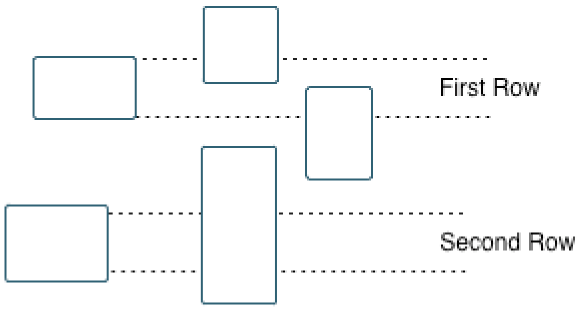
Object Rows

- **Insert anchor for each row**: Inserts an anchor for each row in the summary table.
- **Report On**: Specifies blocks on which to report:
  - `Automatic list from context`. Reports on all blocks in the current context.
  - `Custom - use block list`. Reports on a specified list of blocks. To include a given block in the report, specify its full path.

Loop Options

- **Sort blocks**: Specifies how to sort blocks (applied to each level in a model):
  - `Alphabetically by block name`. Sorts blocks alphabetically by name.
  - `Alphabetically by system name`. Sorts systems alphabetically. Lists blocks in each system, but in no particular order.
  - `Alphabetically by full Simulink path`. Sorts blocks alphabetically by Simulink path.
  - `By block type`. Sorts blocks alphabetically by block type.
  - `By block depth`. Sorts blocks by their depth in the model.
  - `By layout (left to right)`: Sorts blocks by their location in the model layout, by *rows*. The block appearing the furthest toward the left top corner of the model is the anchor for the row. The row contains all other blocks that overlap the horizontal area defined by the top and bottom edges of the anchor block. The

other rows use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.



  - `By layout (top to bottom)`: Sorts blocks by their location in the model layout, by *columns*. The block appearing the furthest toward the left top corner of the model is the anchor for the column. The column contains all other blocks that overlap the vertical area defined by the left and right edges of the anchor block. The other columns use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.
  - `By traversal order`. Sorts blocks by traversal order.
  - `By simulation order`. Sorts blocks by execution order.
- **Search for Simulink property name/property value pairs**: Reports only on Simulink blocks with specified property name/property value pairs.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_fp.cfp_summ_table`

See Also

`Fixed Point Property Table`

Import Generated Code

Import source and header files generated by Simulink Coder software, and custom files specified as part of model

Description

This component imports source and header files generated by Simulink Coder software. It also imports custom files that you specify as part of your model.

Properties

- **Source files (auto-generated)**: Includes the following files in the report:

  - `.c` and `.cpp` source files generated by Simulink Coder software.
  - Simulink Coder source files, such as the setup file and supporting files in the build folder.

  This check box is selected by default. Clear it to omit source files.
- **Header files (auto-generated)**: Includes the following files in the report:

  - `.h` and `.hpp` header files generated by Simulink Coder software.
  - Simulink Coder header files in the build folder.

  This check box is selected by default. Clear it to omit source files.
- **Custom files**: Includes custom source files that you specify in the **Code Generation** > **Custom Code** pane of the Configuration Parameters dialog box. This check box is deselected by default.

Insert Anything into Report?

Yes. Generated code listings.

Class

`RptgenRTW.CImportCode`

See Also

`Code Generation Summary`

Look-Up Table

Report on lookup table blocks

Description

The Look-Up Table component reports on the following blocks in the Simulink Lookup Tables library. Some examples of the lookup table blocks include:

- `1-D Lookup Table`
- `n-D Lookup Table`
- `Cosine`
- `Interpolation Using Prelookup`
- `Direct Lookup Table (n-D)`

The Look-Up Table component inserts a figure and/or table into the report. The table contains input and output numeric values. A figure plots these values.

Note: The Look-Up Table component does not display a table or plot for the `Direct Lookup Table (n-D)` block if the block is configured to generate the table during simulation as a block input. Instead, the Look-Up Table displays a note in the report to the effect that the table is generated dynamically during simulation.

Look-Up Table Options

This pane allows you to specify the types of lookup table blocks to include in the report and how they appear. If you select none of the check boxes in this pane, the component does not insert anything into the report.

- The Look-Up Table displays results according to the type of its parent component:
  - `Model Loop`: Includes all lookup tables in the current model.
  - `System Loop`: Includes all lookup tables in the current system.
  - `Block Loop`: If the current block is a lookup table, the reports that block.
  - `Signal Loop`: Includes all lookup tables connected to the current signal.

  - If the Look-Up Table does not have any of the looping components as its parent, it includes all lookup tables in all open models.
- **Plot 1-D data**: Plots data from a `1-D Lookup Table` block. Choose the plot type, `Line plot` or `Bar plot`, from the corresponding list. The input data appears on the horizontal or *x*-axis, and the output data appears on the vertical or *y*-axis.

  For more information on line and bar plots, see "2-D and 3-D Plots" in the MATLAB Graphics documentation.
- **Create table for 1-D data**: Creates a table that contains numeric data values from the `1-D Lookup Table` block.
- **Plot 2-D data**: Creates a plot of `2-D Lookup Table` blocks. You can specify whether the data appears as a surface plot or a line plot. The line plot is best for small data sets, and the surface plot for larger tables. For more information on surface and line plots, see "2-D and 3-D Plots" in the MATLAB Graphics documentation.

  Note: This option creates a 2-D slice through n-D data.
- **Create table for 2-D data**: Creates a table that contains numeric data values from the `2-D Lookup Table` block.
- **Create table for N-D data**: Creates a table that contains numeric data values from the `n-D Lookup Table` block.

Print Options

- **Image file format**: Specifies the image file format. Select `Automatic HG Format` (the default) to choose automatically the format best suited for the output format that you chose in the Report component. Otherwise, choose an image format that your output viewer can read.

  - `Automatic SL Format` (Uses the Simulink file format selected in the Preferences dialog box)
  - `Bitmap (16m-color)`
  - `Bitmap (256-color)`
  - `Black and white encapsulated PostScript`
  - `Black and white encapsulated PostScript (TIFF)`
  - `Black and white encapsulated PostScript2`

  - `Black and white encapsulated PostScript2 (TIFF)`
  - `Black and white PostScript`
  - `Black and white PostScript2`
  - `Color encapsulated PostScript`
  - `Color encapsulated PostScript (TIFF)`
  - `Color encapsulated PostScript2`
  - `Color encapsulated PostScript2 (TIFF)`
  - `Color PostScript`
  - `Color PostScript2`
  - `JPEG high quality image`
  - `JPEG medium quality image`
  - `JPEG low quality image`
  - `PNG 24-bit image`
  - `TIFF - compressed`
  - `TIFF - uncompressed`
  - `Windows metafile`
- **Paper orientation**:
  - `Landscape`
  - `Portrait`
  - `Rotated`
  - `Use figure orientation`: Uses the orientation for the figure, which you set with the `orient` command.
  - `Full page image (PDF only)`: In PDF reports, scales images to fit the full page, minimizes page margins, and maximizes the size of the image by using either a portrait or landscape orientation.

  For more information about paper orientation, see the `orient` command in the MATLAB documentation.
- **Image size**: Allows you to specify the image size in the report by selecting `Use figure PaperPositionMode setting` and setting the `PaperPositionMode` property of the Handle Graphics figure.

  - `Automatic (same size as on screen)`:
  - `Custom`: Specifies a custom image size. Set the image size using the **Size** field and **Units** list.

  For more information on paper position mode, see `orient` in the MATLAB documentation.
- **Size**: Allows you to enter the size of the Handle Graphics figure snapshot in the format `wxh` (width times height). This field is active only if you choose `Custom` in the **Image size** list box.
- **Units**: Allows you to enter for the size of the Handle Graphics figure snapshot. This field is active only if you choose `Custom` in the **Image size** list box.
- **Invert hardcopy**: Causes the Handle Graphics `InvertHardcopy` property to invert colors for printing. In other words, this option changes dark colors to light colors and light colors to dark colors. To change colors in your image, choose one of the following options:

  - `Automatic`: Automatically changes a dark axes colors to light axes colors. If the axes color is a light color, this option does not invert the color.
  - `Invert`: Changes dark axes colors to light axes colors, and light axes colors to dark axes colors.
  - `Don't invert`: Does not change the colors in the image that appears on the screen for printing.
  - `Use figure's InvertHardcopy setting`: Uses the `InvertHardcopy` property set in the Handle Graphics image.
  - `Make figure background transparent`: Makes the image background transparent.

Display Options

- **Scaling**: Controls size of the image, as displayed in a browser. Making an image larger using this option does not affect the storage size of the image, but the quality of the displayed image may decrease as you increase or decrease the size of the displayed image.

  Generally, to achieve the best and most predictable display results, use the default setting of `Use image size`.

  - `Use image size`: Causes the image to appear the same size in the report as on screen (default).
  - `Fixed size`: Specifies the number and type of units.
  - `Zoom`: Specifies the percentage, maximum size, and units of measure.
- **Size**: Specifies the size of the snapshot in the form `w h` (width, height) format. This field is active only if you choose `Fixed size` in the **Scaling** selection list.
- **Max size**: Specifies the maximum size of the snapshot in the form `w h` (width, height). This field is active only if you choose `Zoom` from the **Scaling** selection list.
- **Units**: Allows you to enter units for the size of the snapshot. This field is active only if you choose `Zoom` or `Fixed size` in the **Image size** list box.
- **Alignment**: Only reports in `PDF` or `RTF` format support this property.
  - `Auto`
  - `Right`
  - `Left`
  - `Center`
- **Title**: Enter text to appear above the snapshot.
- **Caption**: Enter text to appear under the snapshot.

Insert Anything into Report?

Yes. Figure and/or table.

Class

`rptgen_sl.csl_blk_lookup`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `System Loop`

Machine Loop

Run child components for specified Stateflow machines

Description

This component runs its child components for selected Stateflow machines. The behavior of this component depends on its parent component. If it has no parent, the `Machine Loop` runs its child components for all machines. If it has the `Model Loop` is its parent, it runs its child components for all machines in the model.

Loop Options

Search Stateflow

If selected, searches states that you specify in the field that appears under the check box.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to each object in the loop.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`rptgen_sf.csf_machine_loop`

See Also

`Model Loop`

Missing Requirements Block Loop

Apply all child components to blocks that do not have requirements

Description

This component runs its child components for each block in the current system, model, or signal that do not have associated requirements.

For more information on working with looping components, see "Logical and Looping Components" on page 6-21.

Report On

This pane describes the type of object on which this component operates.

- **Automatic list from context**: Report on all blocks in the current context that do not have associated requirements. The parent component of the Block Loop component determines its context. If this component does not have the `Model Loop`, `System Loop`, `Signal Loop`, or `Block Loop` as its parent, selecting this option causes this component to report on all blocks in all models that do not have associated requirements.
  - `Model Loop`: Reports on all blocks in the current model with no associated requirements.
  - `System Loop`: Reports on all blocks in the current system with no associated requirements.
  - `Signal Loop`: Reports on all blocks connected to the current signal with no associated requirements.
- **Custom - use block list**: Enables you to specify a list of blocks on which to report. Enter the full path of each block.

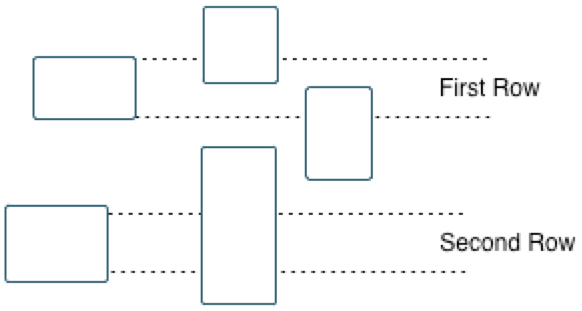
Loop Options

Choose block sorting options and reporting options in this pane.

- **Sort blocks**:

Use this option to select how to sort blocks (applied to each level in a model):

- `Alphabetically by block name`: Sorts blocks alphabetically by their names.
- `Alphabetically by system name`: Sorts systems alphabetically. Lists the blocks in each system, but in no particular order.
- `Alphabetically by full Simulink path`: Sorts blocks alphabetically by Simulink path.
- `By block type`: Sorts blocks alphabetically by block type.
- `By block depth`: Sorts blocks by their depth in the model.
- `By layout (left to right)`: Sorts blocks by their location in the model layout, by *rows*. The block appearing the furthest toward the left top corner of the model is the anchor for the row. The row contains all other blocks that overlap the horizontal area defined by the top and bottom edges of the anchor block. The other rows use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.



- `By layout (top to bottom)`: Sorts blocks by their location in the model layout, by *columns*. The block appearing the furthest toward the left top corner of the model is the anchor for the column. The column contains all other blocks that overlap the vertical area defined by the left and right edges of the anchor block. The other columns use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.
- `By traversal order`. Sorts blocks by traversal order.
- `By simulation order`. Sorts blocks by execution order.
- `%<VariableName>`: Inserts the value of a variable from the MATLAB workspace. The `%<>` notation can denote a string or cell array. The following example reports

on the `theta dot` integrator block and the `theta` integrator block in the model `simppend`, using the variable `Z={ 'simppend/theta'}`:

```
simppend/theta dot
%<Z>
```

The generated report includes information about the following blocks:

- `simppend/theta dot`
- `simppend/theta`

For more information, see `%<VariableName> Notation` on the `Text` component reference page in the MATLAB Report Generator documentation.

- **Search for Simulink property name/property value pairs**: Reports only on Simulink blocks with specified property name/property value pairs that do not have associated requirements.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each block found in the loop.
- **Display the object type in the section title**: Automatically inserts the object type into the section title in the generated report.
- **Create link anchor for each object in loop**: Create a hyperlink to the block in the generated report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class Name

`RptgenRMI.NoReqBlockLoop`

See Also

`Block Loop`, `Missing Requirements System Loop`, `Requirements Block Loop`, `Requirements Documents Table`, `Requirements Signal Loop`, `Requirements Summary Table`, `Requirements System Loop`, `Requirements Table`

MATLAB Function

Insert information about MATLAB Function block contents

Description

This component displays tables with information about MATLAB code included in MATLAB Function blocks. You specify which of the following kinds of information to include in the report:

- Function properties — Parameter settings for the MATLAB Function block
- Argument properties — Properties of the function arguments (for example, complexity)
- The function script — MATLAB code of the function
- Function symbol data — Information about the user-defined and (optionally) built-in MATLAB variables and functions invoked by the MATLAB function that computes the block outputs.
- Supporting functions — User-defined functions and, optionally, MATLAB functions that are included in the MATLAB Function block function.

For details about MATLAB Function blocks, see the `MATLAB Function` block reference page.

Use the MATLAB Function component within a section, paragraph, or table.

Note: To view the contents of a MATLAB Function block in a Web viewer, use the Web view feature of the Simulink Report Generator. In the Web view, hover your cursor over the MATLAB Function block. For details, see "Model Web Views".

Function Properties Table

- **Include function properties**: Generates a table with function property information.
- **Table title**: Insert a title for the function properties table.
  - `Automatic`: Use the default title for the table.
  - `Custom`: Use the title that you specify for the table.

- You can change the header text for property and value columns of the function properties table. In the `Header` column, double-click to change the header text. The `Width` column indicates the relative width, in relative terms, based on the smallest width you specify. For example, for a three-column table, if the first column width is `1`, and the column width of the other two columns is `3`, then the second and third columns is three times wider than the first column.
- **Grid lines**: Show grid lines for the table.
- **Spans page width**: Make the table as wide as the page.

Argument Summary Table

- **Include argument summary table**: Generate a table with summary information about the MATLAB Function block function arguments.
- **Table title**: Insert a title for the argument summary table.
  - `Automatic`: Use the default title for the table.
  - `Custom`: Use the title that you specify for the table.
- **Argument Summary Table Options**: Specify the property columns to include in the table.
  - To add a property column:
    1. In the table on the right, select a property near where you want to insert the new property column.
    2. From the list of properties to the left of the table, select a property that you want to add to the table.
    3. Click the left-arrow button.
    4. If necessary, use the up or down arrow button to position the new column.
  - To delete a property column, select the property in the table and click the right-arrow button
  - You can change the header text for property and value columns of the table. In the `Header` column, double-click to change the header text. The `Width` column indicates the relative width, in relative terms, based on the smallest width you specify. For example, for a three-column table, if the first column width is `1`, and the column width of the other two columns is `3`, then the second and third columns is three times wider than the first column.

- **Grid lines**: Show grid lines for the table.
- **Spans page width**: Make the table as wide as the page.
- **Column alignment**: Align the text in each column:
  - `Left`
  - `Center`
  - `Right`
  - `Double justified`

Detailed Argument Report

- **Include detailed argument report**: Generate a table with detailed information about the MATLAB Function block function arguments.
- **Argument Property Table Format Options**: Specify the argument property columns to include in the table.
  - **Table title**: Insert a title for the argument properties table.
    - `Automatic`: Use the default title for the table.
    - `Custom`: Use the title that you specify for the table.
  - You can change the header text for property and value columns of the table. In the `Header` column, double-click to change the header text.
  - **Grid lines**: Show grid lines for the table.
  - **Spans page width**: Make the variable table as wide as the page on which the table appears.
- **Include function script**: Include the script for the function.
- **Include function symbol data**: Generate a table that includes information about the user-defined and (optionally) built-in MATLAB variables and functions invoked by the MATLAB function that computes the block outputs.
- **Highlight script syntax**: Use colors to highlight syntax keywords.
- **Include supporting functions**: Include a list of functions invoked directly or indirectly by the function script. If you specify to include supporting functions in the report, also specify whether to include both MATLAB and user-defined functions or just user-defined functions.
- **Supporting Function Table Format Options**:

- **Table title**: Insert a title for the supporting functions table.
  - `Automatic`: Use the default title for the table.
  - `Custom`: Use the title that you specify for the table.
- You can change the header text for property and value columns of the table. In the `Header` column, double-click to change the header text. The `Width` column indicates the relative width, in relative terms, based on the smallest width you specify. For example, for a three-column table, if the first column width is `1`, and the column width of the other two columns is `3`, then the second and third columns is three times wider than the first column.
- **Grid lines**: Show grid lines for the table.
- **Spans page width**: Make the table as wide as the page.

Insert Anything into Report?

Yes. Tables and, optionally, code.

Class

`rptgen_sl.csl_emlfcn`

See Also

`Stateflow Property`

Missing Requirements System Loop

Loop only on systems and subsystems that do not have associated requirements

Description

This component runs its child components for each system or subsystem defined by the parent component that does not have associated requirements. Insert this component as the child of a `Model Loop` component to include systems and subsystems that do not have any associated requirements in the report.

Report On

- **Loop on Systems**:
  - **Select systems automatically**: Reports on all systems in the current context that do not have associated requirements.
    - `Model Loop`: Reports on systems in the current model.
    - `System Loop`: Reports on the current system.
    - `Signal Loop`: Reports on the parent system of the current signal.
    - `Block Loop`: Reports on the parent system of the current block.

    If this component does not have any of these components as its parent, selecting this option reports on all systems in all models that do not have associated requirements.
- **Custom - use system list**: Reports on a list of specified systems. Specify the full path of each system.
- `%<VariableName>`: Inserts the value of a variable from the MATLAB workspace. The `%<>` notation can denote a string or cell array. For more information, see `%<VariableName> Notation` on the `Text` component reference page.

Loop Options

- **Sort Systems**: Specifies how to sort systems.

  - `Alphabetically by system name` (default): Sorts systems alphabetically by name.
  - `By number of blocks in system`: Sorts systems by number of blocks. The list shows systems by decreasing number of blocks. In other words, it shows the system with the largest number of blocks that do not have requirements appears first in the list.
  - `By system depth`: Sorts systems by their depth in the model.
  - `By traversal order`: Sorts systems in the traversal order.
- **Search for**: Reports only on blocks with the specified property name/property value pairs. To enable searching, click the check box. In the first row of the property name and property value table, click inside the edit box, delete the existing text, and type the property name and value. To add a row, use the **Add row** button ().

  For information about subsystem property names and values, in "Block-Specific Parameters", see the "Ports & Subsystems Library Block Parameters" section.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Number sections by system hierarchy**: Hierarchically numbers sections in the generated report. Requires that **Sort Systems** be set to `By traversal order`.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`RptgenRMI.NoReqSystemLoop`

See Also

`Block Loop`, `Missing Requirements Block Loop`, `Requirements Block Loop`, `Requirements Documents Table`, `Requirements Signal Loop`, `Requirements Summary Table`, `Requirements System Loop`, `Requirements Table`, `System Loop`

Model Advisor Report

Insert Model Advisor report or link to Model Advisor report for current model

Description

This component inserts a Model Advisor report for the current model into the report if the report is in HTML format. For other report formats, it inserts a link to a Model Advisor report for the current model. For more information about Model Advisor reports, see “Save and View Model Advisor Reports” in the Simulink documentation.

Properties

Use existing report: Includes an existing Model Advisor report in the report. This check box is selected by default. Clearing this option generates a new Model Advisor report.

Insert Anything into Report?

Yes, a Model Advisor report.

Class

`rptgen_sl.CModelAdvisor`

See Also

`Model Change Log`

Model Change Log

Construct model history table that displays model revision information

Description

Run this component before you run the `Model Simulation` component. It uses a reported model's `ModifiedHistory` parameter to construct a model history table that displays information about each logged revision to the model. This model history table includes:

- The author of each change
- The model version of the change
- The time and date of the change
- A description of the change

For more information on model history, see "Log Comments History" in the Simulink documentation.

Tip If your model has a long revision history, consider limiting the number of revisions reported.

Table Columns

Choose the information displayed in the model revision table in this section:

- **Author name**: Includes the name of the person who last revised the model.
- **Version**: Includes the version number of the model.
- **Date changed**: Includes the revision date of the model.
- **Description of change**: Includes a description of the revision to the model.

Table Rows

- **Limit displayed revisions to**: Limits the number of revisions that appears in the report.

- **Show revisions since date**: Limits the number of revisions that appears in the report by date. Enter the date in the corresponding text field. This field supports `%<varname>` notation. For example, the default value, `%<datestr(now-14)>`, returns revision history for the last two weeks.

Table Display

Choose how the model revision history table appears in this section.

- **Table title**: Specifies the title of the table.
- **Sort order**: Sorts the table entries from most recent to oldest, or from oldest to most recent.
- **Date format**: Specifies a preferred date format for the date/time stamps in the table.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sl.csl_mdl_changelog`

See Also

`Model Advisor Report`

Model Configuration Set

Insert active configuration set of a model into a report

Description

This component displays a table with the active configuration set for the model.

For information about configurations sets, see “Manage a Configuration Set”.

Display Options

- **Title**: Specifies a title for the table in the generated report.
  - `Automatic`: Generates a title automatically from the parameter.
  - `Custom`: Specifies a custom title.
  - `None`: Uses no title.
- **Show configuration set table grids**: Show grid lines for the table.
- **Make configuration set tables page wide**: Make the table as wide as the page.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sl.csl_mdl_cfgset`

See Also

`Model Loop`, `System Loop`

Model Loop

Loop on Simulink models and systems, as specified by child components

Description

This component loops on Simulink models and systems, as specified by child components. For example, you can use a `Model Loop` with a child `System Loop` to report on the subsystems of the specified system.

Consider making these components children of the `Model Loop` (although the `Model Loop` not necessarily required to be the immediate parent of a given component).

For conditional processing based of blocks, you can use the `RptgenSL.getReportedBlock` function. For more information, see “Loop Context Functions” on page 6-24.

Models to Include

You can add a model to the list by clicking **Add New Model to List**. The following table shows the buttons you can use to move a model up or down in the list, or to add or delete a model.

Button	Action
⬆	Move a model up in the list.
⬇	Move a model down in the list.
❌	Remove a model from the list.
+	Add a new model to the list.

Model Options

- **Active**: Includes a given model in the loop. This option is selected by default. Clearing this option omits the model from the loop.

  This option allows you to temporarily omit one or more models from a report.
- **Model name**: Specifies the model name.
  - `Current block diagram`
  - `All open models`
  - `All open libraries`
  - `Block diagrams in current directory`
  - `Custom block diagram`: Selecting this option automatically sets the **Starting system(s)** field `$top` to start in the model root system.
  - `%<VariableName>`: For more information, see `%<VariableName> Notation` on the `Text` component reference page in the MATLAB Report Generator documentation.
- **Traverse model**: Specifies the systems to traverse.
  - `All systems in model`
  - `Selected system(s) only`
  - `Selected system(s) and ancestors`
  - `Selected system(s) and children`
- **Look under masks**: Specifies how to handle masks.
  - `Functional masks only`
  - `No masks`
  - `All masks`
  - `Graphical masks only`

  For more information, see “Block Masks” in the Simulink documentation.
- **Follow library links**: Specifies library links to include.
  - `Do not follow library links`
  - `Include library links`

  - `Include unique library links`

  For more information, see “Work with Library Links” in the Simulink documentation.

- **Model reference**: Specifies whether to report on models referenced by a Model block. If you want to report on referenced models, then you can control the depth of the model referencing hierarchy and whether to report on model reference variants.

  - `Do not follow model reference blocks`: Do not report on blocks contained in referenced models.
  - `Follow all model reference blocks`: Report on blocks contained in all models that any part of the model hierarchy references.
  - `Follow model reference blocks defined in current model`: Report on blocks in models that the currently selected model references.
  - `<Custom model reference depth>`: Report on blocks in models that your specified level in the model reference hierarchy references.
- **Include all variants**: Report on all model reference variants. To enable this option, set the **Model reference** option to report on blocks in referenced models.
- **Starting system(s)**: Specifies the system in which to start the loop. Available options depend on the value that you select in the **Traverse model** option. Selecting any option other than `All systems in model` for **Traverse model** activates the **Starting system(s)** option.

  If you do not enter a model name in the **Model name** option, then select either `Root model` or `Current` to specify where to start the loop.

  If you specify a model name in the **Model name** option, then the **Starting system(s)** option provides an edit box in which you can enter:

  - The full path of a subsystem or subsystems
  - `$top` to start the loop in the model root system
  - `$current` to start the loop in the currently selected system

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.

- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report.

Examples

Generating Reports on Specified Systems and their Subsystems

This example shows how to loop over a specified system and its subsystems in the sample model `sldemo_auto_climate_elec`, which the Simulink software includes.

1. (Optional) To open the `sldemo_auto_climate_elec` model, at the MATLAB command prompt, enter the following command:

   ```
   sldemo_auto_climate_elec
   ```

   Explore the model to familiarize yourself with its subsystems.
2. Open the Report Explorer.
3. Create a report setup file by clicking **File** > **New**.
4. Save the report setup file by clicking **File** > **Save As**. Give it the name `sldemo_auto_report`.
5. Add a `Chapter/Subsection` component to the report setup file to include information about model subsystems:

   a. In the Library pane in the middle, double-click `Chapter/Subsection` to add it to the report setup file.
   b. For **Title**, choose `Custom`. In the title field, enter `Description of subsystems`.
6. Add a `Model Loop` as a child of the `Chapter/Subsection` component. This loops over the `ClimateControlSystem` system and its subsystems in the `sldemo_auto_climate_elec` model:

   a. In the Library pane in the middle, double-click `Model Loop` to add it to the report setup file. By default, the Report Explorer adds that component as a child of the `Chapter/Subsection` component.
   b. In the Model Loop properties pane, from the **Model name** selection list, select `<Custom block diagram>` .

c. In the **Model name** field, delete the text `<Custom block diagram>`, and then enter `sldemo_auto_climate_elec.slx`. Click any component in the report setup file to add this model to the **Models to include** list.

d. In the **Traverse model** selection list, select `Selected system(s) and children`.

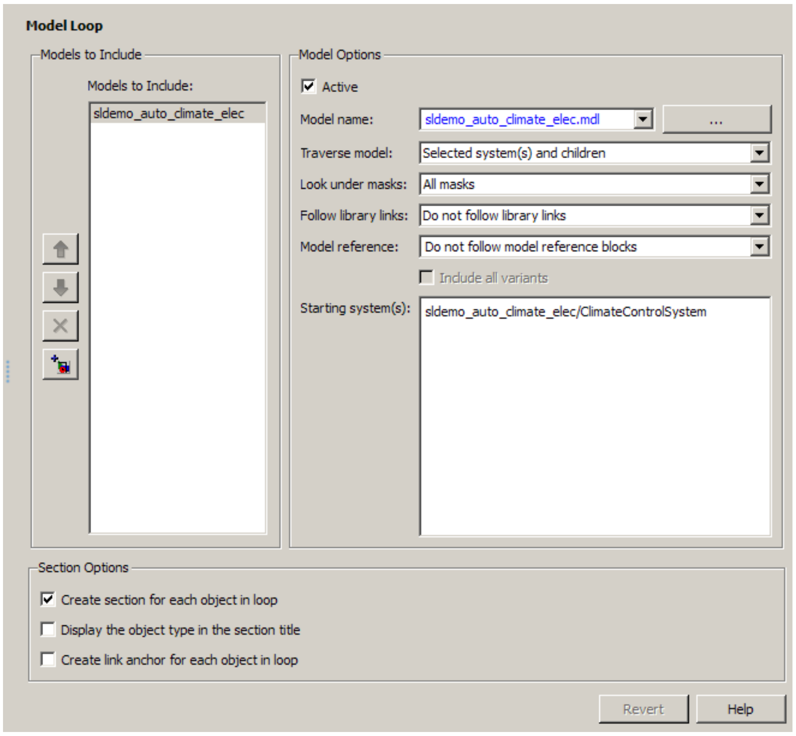
e. In the **Look under masks** selection list, select `All masks`.

f. In the **Model reference** selection list, select `Do not follow model reference blocks`.

g. In the **Starting system(s)** field, enter `sldemo_auto_climate_elec/ClimateControlSystem`. Because you selected `Selected system(s) and children` for **Traverse model**, the `Model Loop` loops over `sldemo_auto_climate_elec/ClimateControlSystem` and its subsystems.

h. Under **Section Options**, select the **Create section for each object in loop** check box. Selecting this option creates separate sections in the generated report for each model over which the component loops.

The `Model Loop` properties pane looks as follows.



Model Options:

- [✓] Active
- Model name: sldemo_auto_climate_elec.mdl
- Traverse model: Selected system(s) and children
- Look under masks: All masks
- Follow library links: Do not follow library links
- Model reference: Do not follow model reference blocks
- [ ] Include all variants
- Starting system(s): sldemo_auto_climate_elec/ClimateControlSystem

Section Options:

- [✓] Create section for each object in loop
- [ ] Display the object type in the section title
- [ ] Create link anchor for each object in loop

7 Save the report by clicking **File** > **Save**.

8 Add a `System Loop` as a child of the `Model Loop` component.

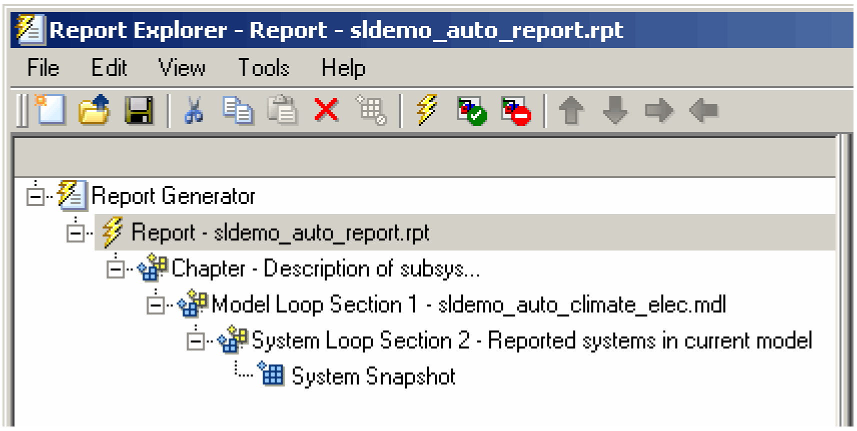
   a In the Library pane in the middle, double-click `System Loop` to add it to the report setup file. By default, Model Explorer adds this component as a child of the `Model Loop` component.

   b In the `System Loop` properties pane, under **Section Options**, select the **Create section for each object in loop** check box. Selecting this option creates a section in the generated report for each subsystem on which the component loops. Accept the default values for all other fields.

9 Add a `System Snapshot` component as a child of the `System Loop` component. This step creates snapshots of all the subsystems of `ClimateControlSystem` in the generated report. In the Library pane in the middle, double-click `System Snapshot`. By default, Model Explorer adds this component as a child of the `System Loop` component.

10 Save the report.

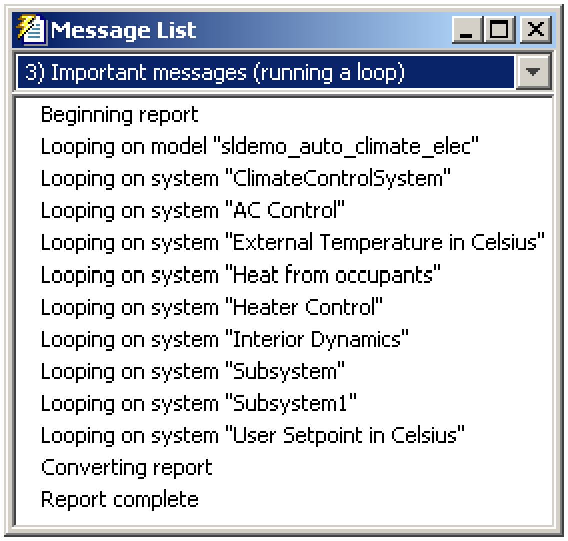
The report setup file hierarchy now looks as follows.


Report Explorer - Report - sldemo_auto_report.rpt
File Edit View Tools Help

Report Generator
Report - sldemo_auto_report.rpt
Chapter - Description of subsys...
Model Loop Section 1 - sldemo_auto_climate_elec.mdl
System Loop Section 2 - Reported systems in current model
System Snapshot

11 Run the report by clicking **File** > **Report**.

The report loops on the system `ClimateControlSystem` of the `sldemo_auto_climate_elec` model and all of its subsystems, as shown in the following Message List.



```
Beginning report
Looping on model "sldemo_auto_climate_elec"
Looping on system "ClimateControlSystem"
Looping on system "AC Control"
Looping on system "External Temperature in Celsius"
Looping on system "Heat from occupants"
Looping on system "Heater Control"
Looping on system "Interior Dynamics"
Looping on system "Subsystem"
Looping on system "Subsystem1"
Looping on system "User Setpoint in Celsius"
Converting report
Report complete
```

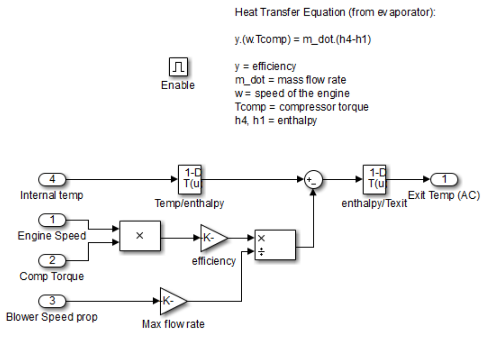
Below is an excerpt from the generated report.

Chapter 1. Description of subsystems

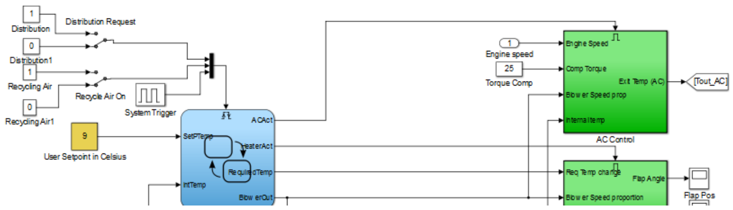
Table of Contents

sldemo_auto_climate_elec

AC Control



ClimateControlSystem



Temporarily Omitting a Model from a Loop

This example shows how to use the `Model Loop` **Active** check box to temporarily omit a model from the loop. This example uses the report setup file that you created in Generating Reports on Specified Systems and their Subsystems, `sldemo_auto_report.rpt`, and the model `f14`, which the Simulink software includes.

1 In the Report Explorer, click **File** > **Open**, and then open `sldemo_auto_report.rpt` by double-clicking it.

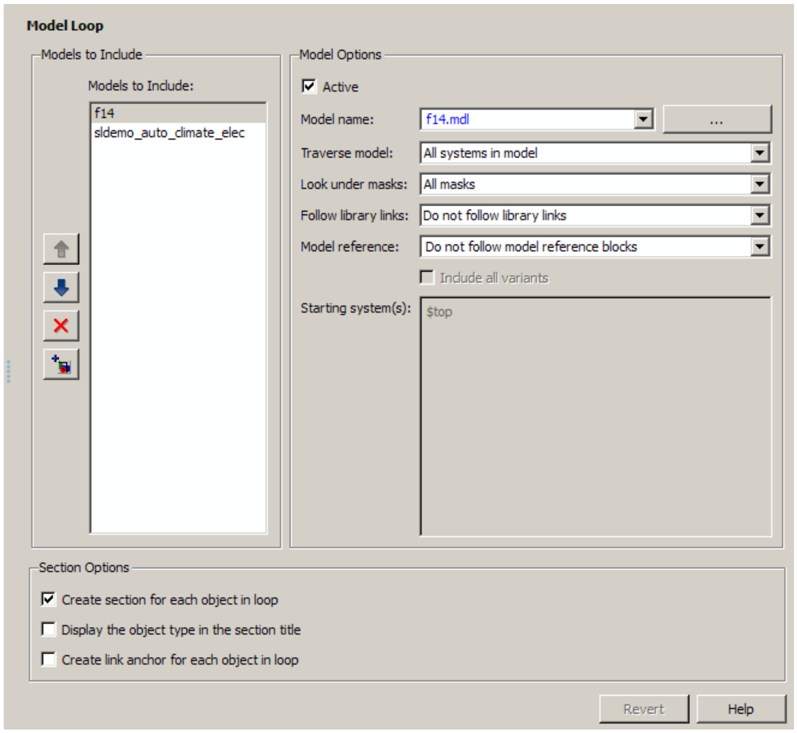
2 In the Outline pane on the left, click `Model Loop Section 1 - sldemo_auto_climate_elec`.

3 In the `Model Loop` properties pane, click the button to add a model to the **Models to include** list.

4 In the `Model Loop` properties pane, from the **Model name** selection list, select `<Custom block diagram>`.

5 In the **Model name** field, delete the text `<Custom block diagram>` and enter `f14.mdl`.

The `Model Loop` properties pane now looks as follows.



Model Loop

Models to Include

Models to Include:
- f14
- sldemo_auto_climate_elec

Model Options

[✓] Active

Model name:	f14.mdl
Traverse model:	All systems in model
Look under masks:	All masks
Follow library links:	Do not follow library links
Model reference:	Do not follow model reference blocks
	[ ] Include all variants
Starting system(s):	$top

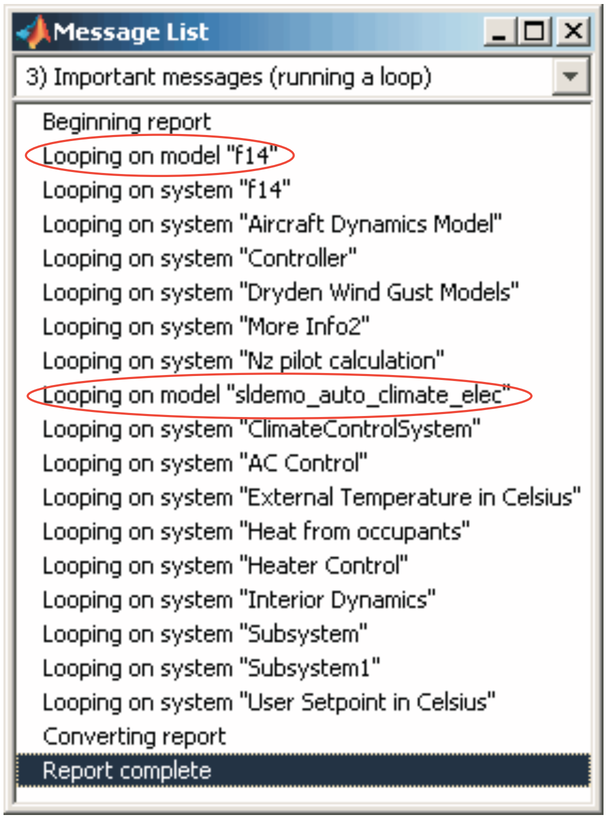
Section Options

[✓] Create section for each object in loop
[ ] Display the object type in the section title
[ ] Create link anchor for each object in loop

6 Save the report setup file.

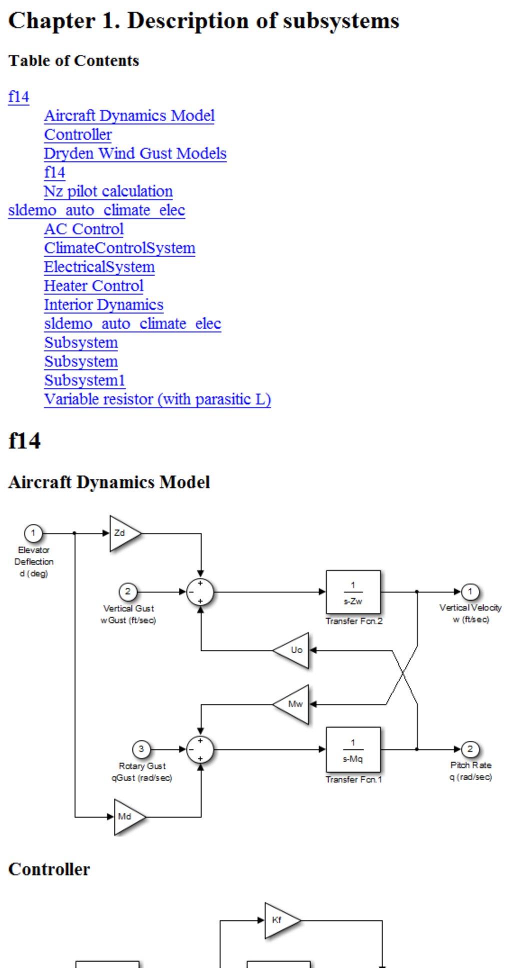
7 Generate the report.

The report generation process loops over the specified systems in the `f14` and `sldemo_auto_climate_elec` models, as shown in the following message box.



```
Beginning report
Looping on model "f14"
Looping on system "f14"
Looping on system "Aircraft Dynamics Model"
Looping on system "Controller"
Looping on system "Dryden Wind Gust Models"
Looping on system "More Info2"
Looping on system "Nz pilot calculation"
Looping on model "sldemo_auto_climate_elec"
Looping on system "ClimateControlSystem"
Looping on system "AC Control"
Looping on system "External Temperature in Celsius"
Looping on system "Heat from occupants"
Looping on system "Heater Control"
Looping on system "Interior Dynamics"
Looping on system "Subsystem"
Looping on system "Subsystem1"
Looping on system "User Setpoint in Celsius"
Converting report
Report complete
```

Below is an excerpt from the generated report.



Chapter 1. Description of subsystems

Table of Contents

f14

Aircraft Dynamics Model

1
Elevator Deflection d (deg)
Zd
2
Vertical Gust wGust (ft/sec)
1
s-Zw
Transfer Fcn.2
1
Vertical Velocity w (ft/sec)
Uo
Mw
3
Rotary Gust qGust (rad/sec)
1
s-Mq
Transfer Fcn.1
2
Pitch Rate q (rad/sec)
Md

Controller

8 In the **Models to include** list, click `f14` to select it.

9 Clear the **Active** check box to omit `f14` model information from the generated report.

10 Rerun the report.

The report now includes information only on the `sldemo_auto_climate_elec` model, as shown at the end of the previous example, Generating Reports on Specified Systems and their Subsystems.

11 To reactivate the `f14` model, in the Model Loop **Models to include** list, select the `f14` model and then select the **Active** check box.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`rptgen_sl.csl_mdl_loop`

See Also

`Block Loop`, `System Loop`

Model Simulation

Run current model with specified simulation parameters

Description

This component runs the current model using specified simulation parameters. Ensure that this component has the `Model Loop` component as its parent.

For more information on simulation parameters, see “Configure Simulation Conditions” in the Simulink documentation.

I/O Parameters

Use model's workspace I/O variable names

Use the names of the parameters specified in the Simulation Parameters dialog box.

The following options are available if you do not select the **Use model's workspace I/O variable names** option:

- **Time** : Specifies a new variable name for the `Time` parameter.
- **States**: Specifies a new variable name for the `States` parameter.
- **Output**: Specifies a new variable name for the `Output` parameter.

Timespan

Use model's timespan values: Use the model's `Start time` and `Stop time` values, as specified in the **Solver** tab in the Simulation Parameters dialog box.

The following options are available if you do not select the **Use model's timespan values** option:

- **Start**: Specifies a simulation starting time.
- **Stop**: Specifies a simulation ending time.

Note: If you set the stop time of your model to `inf` (infinity) in Simulink or on this component attribute page, Simulink Report Generator terminates the model simulation after 60 seconds. Terminating the report prevents the report generation process from entering an infinite loop.

Simulation Options

- **Compile model before simulation**: Compiles the model before simulating, preserving scope content. Select this option if:
  - You use Simulink Coder Summary properties.
  - You sort systems or blocks by simulation order.
  - You use scope snapshots.
- **Simulation status messages**: Displays simulation status messages, or inserts them into the report.
  - `Display to command line`: Sends messages to a command-line window.
  - `Display to Report Generator Message List`: Sends messages to the Simulink Report Generator message window.
  - `Insert into report`: Includes messages in the report.
- **Simulation parameters**: Specifies simulation parameters.

Insert Anything into Report?

No.

Class

`rptgen_sl.csl_mdl_sim`

See Also

`Model Loop`

Object Loop

Run child components for Stateflow objects, and then insert table into report

Description

This component runs its child components for each Stateflow object and inserts a table into the generated report.

For conditional processing of Stateflow objects, you can use the `RptgenSF.getReportedObject` function. For more information, see "Loop Context Functions" on page 6-24.

Object Types

- **Report on "Data" objects**: Includes Stateflow data objects in the loop.
- **Report on "Event" objects**: Includes Stateflow event objects in the loop.
- **Report on "Transition" objects**: Includes Stateflow transition objects in the loop.
- **Report on "Junction" objects**: Includes Stateflow junction objects in the loop.
- **Report on "Target" objects**: Includes Stateflow target objects in the loop.
- **Report on "Note" objects**: Includes Stateflow note objects in the loop.

Loop Options

- **Report depth**: Specifies the level at which to loop:
  - `Local children only` (Default). Reports only on children one level down.
  - `All objects`. Reports on all Stateflow objects.
- **Skip autogenerated charts under truth tables**: Excludes autogenerated charts under truth tables from the report.
- **Remove objects which do not contain more information than a snapshot**: Excludes objects that contain only a snapshot.
- **Search Stateflow**: Reports on Stateflow charts with specified property name/ property value pairs.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Automatically inserts the object type into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to the Stateflow object in the generated report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`rptgen_sf.csf_obj_loop`

See Also

`Stateflow Filter`, `Stateflow Hierarchy`, `Stateflow Hierarchy Loop`, `Simulink Function System Loop`

Requirements Block Loop

Apply child components to blocks with requirements

Description

This component applies its child components to blocks with associated requirements.

Report On

- **Automatic list from context**: If selected, this option reports on all blocks in the current context. The parent of the `Requirements Block Loop` component determines its context.

  - `Model Loop`: Reports on all blocks with requirements in the current model.
  - `System Loop`: Reports on all blocks with requirements in the current system.
  - `Signal Loop`: Reports on all blocks with requirements connected to the current signal.

  If the `Requirements Block Loop` does not have the `Model Loop`, `System Loop`, `Signal Loop`, or `Block Loop` component as its parent, it reports on all blocks in all models.
- **Custom - use block list**: Reports on a list of blocks with specified requirements. Enter the full paths of each block into this field.

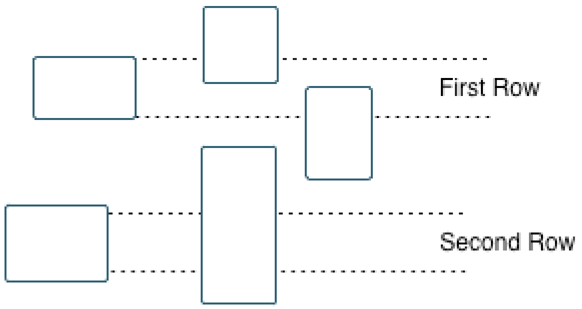
Loop Options

- **Sort blocks**

  Specify how to sort blocks (applied to each level in a model):

  - `Alphabetically by block name`: Sorts blocks alphabetically by name.
  - `Alphabetically by system name`: Sorts systems and subsystems alphabetically by name. (Blocks in each system do not appear in alphabetical order).

- `Alphabetically by full Simulink path`: Sorts blocks alphabetically by Simulink path.
- `By block type`: Sorts blocks alphabetically by block type.
- `By block depth`: Sorts blocks by their depth in the model.
- `By layout (left to right)`: Sorts blocks by their location in the model layout, by *rows*. The block appearing the furthest toward the left top corner of the model is the anchor for the row. The row contains all other blocks that overlap the horizontal area defined by the top and bottom edges of the anchor block. The other rows use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.



- `By layout (top to bottom)`: Sorts blocks by their location in the model layout, by *columns*. The block appearing the furthest toward the left top corner of the model is the anchor for the column. The column contains all other blocks that overlap the vertical area defined by the left and right edges of the anchor block. The other columns use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.
- `By traversal order`: Sorts blocks by traversal order.
- `By simulation order`: Sorts blocks by execution order.

• **Search for Simulink property name/property value pairs**: Reports on Simulink blocks with specified property name/property value pairs that have associated requirements.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each block found in the loop that has associated requirements.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to the block in the generated report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`RptgenRMI.CBlockLoop`

See Also

`Missing Requirements Block Loop`, `Missing Requirements System Loop`, `Model Loop`, `Requirements Block Loop`, `Requirements Documents Table`, `Requirements Signal Loop`, `Requirements Summary Table`, `Requirements System Loop`, `Requirements Table`

Requirements Documents Table

Insert table of linked requirements documents

Description

This component creates a table that lists all requirements documents linked to model objects.

Table Options

- **Show documents linked to**
  - `Simulink and Stateflow objects`: Inserts requirements documents linked to both Simulink and Stateflow objects in the model.
  - `Simulink objects`: Inserts requirements documents linked only to Simulink objects in the model.
  - `Stateflow objects`: Inserts requirements documents linked only to Stateflow objects in the model.
- **Table title**: Specifies a title for the table.
  - `No title`
  - `Model name` (Default)
  - `Custom`

Table Columns

- **Replace document paths with links**: Inserts links to requirements documents when possible.
- **When replacing with links, note absolute vs. relative file path**: Indicates absolute or relative file paths when including links to requirements documents.
- **Include document modification time**: Includes the document modification information.

- **Count # references to each document**: Includes a count of the number of references to the requirements document in the model.

Document References

- **Replace file names with document IDs in the main body of the report**: Includes shortened IDs to identify requirements documents to simplify the requirements documents table.
- **Retrieve full module path for DOORS links (requires login)**: This option applies only to DOORS® requirements. Append the DOORS module ID to the module path in the DOORS database if the module information is not stored with the model.

Insert Anything into Report?

Yes. Table.

Class

`RptgenRMI.ReqDocTable`

See Also

, `Requirements Summary Table`, `Requirements Table`

Requirements Signal Loop

Apply all child components to signal groups with requirements

Description

The Requirements Signal Loop component applies all child components to signal groups that have requirements in Signal Builder blocks.

Properties

- **Create link anchor for each object in loop**: Creates a hyperlink to each object with requirements in the loop.
- **Display the object type in the section title**: Inserts the object name with requirements into the section title.
- **Create section for each object in loop**: Creates a hyperlink to each object with requirements in the loop.
- **Section Type**: Specifies the section type to insert. If you choose `Automatic`, the Simulink Report Generator software determines the appropriate section type:
  - `Book`
  - `Chapter`
  - `Section 1`
  - `Section 2`
  - `Section 3`
  - `Section 4`
  - `Section 5`
  - `Simple Section`
  - `Automatic`

Report On

Loops on signal groups in systems:

- `Collect all Signal Builders`: Processes all Signal Builder blocks, looking for signal groups with requirements.
- `Custom - use list`: Processes all subsystems in the user-defined list. If a subsystem on the list does not have requirements, the Simulink Report Generator software does not include it in the report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`RptgenRMI.CSystemLoop`

See Also

`Missing Requirements Block Loop`, `Missing Requirements System Loop`, `Requirements Block Loop`, `Requirements Documents Table`, `Requirements Summary Table`, `Requirements System Loop`, `Requirements Table`, `Signal Loop`

Requirements Summary Table

Properties of blocks, systems, or Stateflow objects with associated requirements

Description

This component displays properties of blocks, systems, or Stateflow objects with associated requirements.

Object Type

Choose the object type to display in the generated report.

- `Block` (Default)
- `System`
- `Stateflow`

The selected object type affects the options available in the **Property Columns** pane.

Table Title

Specify a table title in the generated report.

- `Automatic`: Generates a title automatically from the parameter.
- `Custom`: Specifies a custom title.

Property Columns

- Object properties to include in the Requirements Summary Table appear in a list.
  - To add a property:
    1. Select the appropriate property level in the text box on the left.
    2. In the text box on the right, select the property that you want to add and click **Add**.
  - To delete a property, select the property name and click **Delete**.

`%<SplitDialogParameters>` is a unique property that you can specify for Requirements Summary Tables where the object type is `Block`. This property generates multiple summary tables, grouped by block type. Each Summary Table group contains the dialog box parameters for that block.

Some entries in the list of available properties (such as `Depth`) are “virtual” properties that you cannot access using the `get_param` command. The properties used for property/value filtering in the block and System Loop components must be retrievable by the `get_param`. Therefore, you cannot configure your Requirements Summary Table to report on all blocks of `Depth` == 2.

- **Remove empty columns**: Removes empty columns from the table.
- **Transpose table**: Changes the summary table rows into columns in the generated report, putting the property names in the first column and the values in the other columns.

Object Rows

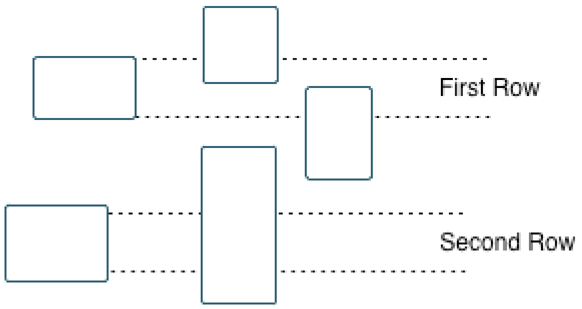
- **Insert anchor for each row**: Inserts an anchor for each row in the Requirements Summary Table.
- **Report On**
  - `Automatic list from context`: Reports on all blocks in the current context. The parent of this component determines its context.
  - `Custom - use block list`: Reports on a list of blocks that you specify, and enters the block names in the corresponding field. Specify the full path of each block.

Loop Options

Choose block sorting options and reporting options in this pane.

- **Sort blocks**: Use this option to select how to sort blocks (applied to each level in a model):
  - `Alphabetically by block name`: Sorts blocks alphabetically by name.
  - `Alphabetically by system name`. Sorts systems alphabetically. Lists blocks in each system, but in no particular order.

  - `Alphabetically by full Simulink path`: Sorts blocks alphabetically by Simulink path.
  - `By block type`: Sorts blocks alphabetically by block type.
  - `By block depth`: Sorts blocks by their depth in the model.
  - `By layout (left to right)`: Sorts blocks by their location in the model layout, by *rows*. The block appearing the furthest toward the left top corner of the model is the anchor for the row. The row contains all other blocks that overlap the horizontal area defined by the top and bottom edges of the anchor block. The other rows use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.



  - `By layout (top to bottom)`: Sorts blocks by their location in the model layout, by *columns*. The block appearing the furthest toward the left top corner of the model is the anchor for the column. The column contains all other blocks that overlap the vertical area defined by the left and right edges of the anchor block. The other columns use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.
  - `By traversal order`: Sorts blocks by traversal order.
  - `By simulation order`: Sorts blocks by execution order.
- **Search for Simulink property name/property value pairs**: Reports on blocks with specified property name/property value pairs.

Insert Anything into Report?

Yes. Table.

Class

`RptgenRMI.CSummaryTable`

See Also

`Block Loop`, `Missing Requirements Block Loop`, `Missing Requirements System Loop`, `Requirements Block Loop`, `Requirements Documents Table`, `Requirements Signal Loop`, `Requirements System Loop`, `Requirements Table`

Requirements System Loop

Apply child components to systems with requirements

Description

This component applies its child components to systems with associated requirements.

Report On

- **Loop on systems**
  - `Select systems automatically`: If selected, this option reports on all systems in the current context. The parent of the component determines the context of this setting:
    - `Model Loop`: Reports on systems in the current model.
    - `System Loop`: Reports on the current system.
    - `Signal Loop`: Reports on the parent system of the current signal.
    - `Block Loop`: Reports on the parent system of the current block.

    If the `Requirement System Loop` does not have any of these components as its parent, selecting this option reports on all systems with requirements in all models.
  - `Custom - use system list`: Reports on a list of specified systems. Enter the full path of each system.

Loop Options

- **Sort Systems**:
  - `Alphabetically by system name` (default): Sorts systems alphabetically by name.
  - `By number of blocks in system`: Sorts systems by the number of blocks in the system. The list displays systems by decreasing number of blocks; the system with the largest number of blocks appears first in the list.

  - `By system depth`: Sorts systems by their depth in the model.
  - `By traversal order`: Sorts systems in the traversal order .
- **Search for**: Reports on Simulink blocks with specified property name/property value pairs.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Number sections by system hierarchy**: Numbers sections in the generated report hierarchically. Requires that **Sort Systems** be set to `By traversal order`.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`RptgenRMI.CSystemLoop`

See Also

`Missing Requirements Block Loop`, `Missing Requirements System Loop`, `Requirements Block Loop`, `Requirements Documents Table`, `Requirements Signal Loop`, `Requirements Summary Table`, `Requirements Table`, `System Loop`

Requirements Table

Requirements links for current context

Description

This component creates a table that contains information from the Simulink Verification and Validation software. Objects can have multiple requirements. Each requirement is a row in the table.

Table Options

- **Show requirements for current**: Specifies the object type to display.
  - `Simulink object`
  - `Stateflow object`
- **Table title**: Specifies a title for the table.
  - `No title`
  - `Object name` (Default)
  - `Custom`

Table Columns

- **Description**: Includes the object description in the table.
- **Document name**: Includes the report name in the table.
- **Locations within document**: Includes the locations of the object within the document in the table.
- **Requirement keyword**: Includes the requirement keyword for the object in the table.

Insert Anything into Report?

Yes. Table.

Class

`RptgenRMI.CReqTable`

See Also

`Missing Requirements Block Loop`, `Missing Requirements System Loop`, `Requirements Block Loop`, `Requirements Documents Table`, `Requirements Signal Loop`, `Requirements Summary Table`, `Requirements System Loop`, `Stateflow Automatic Table`, `Stateflow Name`

Scope Snapshot

Insert images of scopes and XY graphs

Description

This component inserts images of scopes and XY graphs. Examples of blocks for which this component inserts snapshots include:

- Scope (and Floating Scope) blocks and the XY Graph block (Simulink)
- Spectrum Analyzer and Time Scope blocks (DSP System Toolbox™)
- Video Viewer (Computer Vision System Toolbox™)
- Blocks in the Simulink Control Design™ Linear Analysis Plots library (for example, the Bode Plot block)

If the model has not been simulated, scopes are empty. For more information, see the `Model Simulation` component reference page.

The parent component of the Scope Snapshot determines its behavior.

- `Model Loop` or `no Simulink looping component`: Includes all XY graphs and scopes in the current model.
- `System Loop`: Includes all XY graphs and scopes in the current system.
- `Block Loop`: Includes the current block when it is an XY graph or scope.
- `Signal Loop`: Includes all XY graphs and scopes connected to the current signal.

  If the Scope Snapshot does not have any of the Simulink looping components as its parent, it includes all XY graphs and scopes in all open models.

Scope Options

- **Report on closed scopes**: Takes a snapshot of all scopes in context. This option forces closed scopes to open when the report is generating.
- **Autoscale time axis**: Scales the Simulink scope time axis to include the entire log.

Print Options

- **Image file format**: Specifies the image file format (for example, JPEG, TIFF, etc.). Select `Automatic HG Format` (the default) to choose the format best suited for the specified output format automatically. Otherwise, choose an image format that your output viewer can read.
  - `Automatic HG Format` (uses the Simulink file format selected in the Preferences dialog box)
  - `Bitmap (16m-color)`
  - `Bitmap (256-color)`
  - `Black and white encapsulated PostScript`
  - `Black and white encapsulated PostScript (TIFF)`
  - `Black and white encapsulated PostScript2`
  - `Black and white encapsulated PostScript2 (TIFF)`
  - `Black and white PostScript`
  - `Black and white PostScript2`
  - `Color encapsulated PostScript`
  - `Color encapsulated PostScript (TIFF)`
  - `Color encapsulated PostScript2`
  - `Color encapsulated PostScript2 (TIFF)`
  - `Color PostScript`
  - `Color PostScript2`
  - `JPEG high quality image`
  - `JPEG medium quality image`
  - `JPEG low quality image`
  - `PNG 24-bit image`
  - `TIFF - compressed`
  - `TIFF - uncompressed`
  - `Windows metafile`
- **Paper orientation**:

  - `Landscape`
  - `Portrait`
  - `Rotated`
  - `Use figure orientation`: Uses the orientation for the figure, which you set with the `orient` command.
  - `Full page image (PDF only)`: In PDF reports, scales images to fit the full page, minimizes page margins, and maximizes the size of the image by using either a portrait or landscape orientation.

  For more information about paper orientation, see the `orient` reference page in the MATLAB documentation.

- **Image size**: Specifies the size of the Handle Graphics figure snapshot in the form `[w h]` (width, height). In the units text box, select one of the following options:

  - `Inches`
  - `Centimeters`
  - `Points`
  - `Normalized`

- **Invert hardcopy**: Inverts colors for printing; changes dark colors to light colors and light colors to dark colors.

  - `Automatic`: Automatically changes dark axes colors to light axes colors. If the axes color is a light color, this option does not invert the color.
  - `Invert`: Changes dark axes colors to light axes colors and light axes colors to dark axes colors.
  - `Don't invert`: Does not change the colors in the image on the screen for printing.
  - `Use figure's InvertHardcopy setting`: Uses the `InvertHardcopy` property set in the Handle Graphics image.
  - `Make figure background transparent`: Makes the image background transparent.

Display Options

- **Scaling**: Controls size of the image, as displayed in a browser. Making an image larger using this option does not affect the storage size of the image, but the quality of the displayed image may decrease as you increase or decrease the size of the displayed image.

  Generally, to achieve the best and most predictable display results, use the default setting of `Use image size`.

  - `Use image size`: Causes the image to appear the same size in the report as on screen (default).
  - `Fixed size`: Specifies the number and type of units.
  - `Zoom`: Specifies the percentage, maximum size, and units of measure.
- **Size**: Specifies the size of the snapshot in the form `w h` (width, height). This field is active only if you choose `Fixed size` from the **Scaling** selection list.
- **Max size**: Specifies the maximum size of the snapshot in the form `w h` (width, height). This field is active only if you choose `Zoom` from the **Scaling** selection list.
- **Units**: Specifies the units for the size of the snapshot. This field is active only if you choose `Zoom` or `Fixed size` in the **Image size** list box.
- **Alignment**: Only reports in `PDF` or `RTF` format support this property.
  - `Auto`
  - `Right`
  - `Left`
  - `Center`
- **Title**: Specifies a title for the snapshot figure.
  - `Block name`: Uses the block name as the title.
  - `Full Simulink path name`: Uses the Simulink path as the title.
  - `Custom`: Specifies a custom title.
- **Caption**: Select or enter a short text description for the snapshot figure.
  - `No caption`
  - `Automatic (use block description)`. Uses the Simulink block description as the caption.

- `Custom`. Specifies a short text description for the snapshot figure.

Insert Anything into Report?

Yes. Image.

Class

`rptgen_sl.csl_blk_scope`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `System Loop`

Signal Loop

Run child components for each signal contained in current system, model, or block

Description

The Signal Loop component runs its child components for each signal contained in the current system, model, or block. The parent component determines the behavior of this component.

- `Model Loop`: Loops on all signals in the current model.
- `System Loop`: Loops on all signals in the current system. Choose not to report on the following types of signals by clearing the corresponding option in the **Section options** area:
  - `System input signals`
  - `System output signals`
  - `System internal signals`
- `Signal Loop`: Loops on the current signal.
- `Block Loop` : Loops on all signals connected to the current block. Choose not to report on the following types of signals by clearing the corresponding option in the **Section options** area:
  - `Block input signals`
  - `Block output signals`
- If the Signal Loop does not have a looping component as its parent, it loops on all signals in all models. Choose not to report on the following types of signals by clearing the corresponding option in the **Section options** area:
  - `Block input signals`
  - `Block output signals`
  - `System input signals`
  - `System output signals`
  - `System internal signals`

For conditional processing of signals, you can use the `RptgenSL.getReportedSignal` function. For more information, see “Loop Context Functions” on page 6-24.

Select Signals

- **Include block input signals**: Loops on signals that feed into blocks. This option is valid only when the parent component of this component is a`Block Loop`.
- **Include block output signals**: Loops on signals that leave the block. This option is valid only when the parent component of this component is a`Block Loop`.
- **Include system input signals**: Loops on signals coming from inports. This option is valid only when the parent component of this component is a`System Loop`.
- **Include system internal signals**: Loops on system internal signals. This option is valid only when the parent component of this component is a`System Loop`.
- **Include system output signals**: Loops on signals going to outports. This option is valid only when the parent component of this component is a`System Loop`.
- **Sort signals**: Specifies how to sort signals:
    - `Alphabetically by signal name`: Sorts signals alphabetically by name.
    - `Alphabetically by signal name (exclude empty)`: Sorts signals alphabetically by name.
    - `Alphabetically by system name`: Sorts alphabetically by parent system names. Lists signals in each system, but in no particular order.
    - `By signal depth`: Sorts signals by their depth in the model.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Automatically inserts the object type into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`rptgen_sl.csl_sig_loop`

See Also

`Block Loop`, `Model Loop`, `System Loop`

Simulink Automatic Table

Insert two-column table with information on selected model, system, signal, or block

Description

This component inserts a two-column table that contains details for the selected model, system, signal, or block into a generated report.

Options

- **Show current**: Modeling object to specify properties for.
  - `Automatic`: Uses the context of the parent loop.
  - `Model`
  - `System`
  - `Block`
  - `Annotation`
- **Properties list**: Specifies whether to have Report Explorer select properties automatically or to list the properties to report on.
  - `Determine properties automatically`: Let the Report Explorer automatically select the properties to report.

Modeling Component Selected in the Show current Field	Listed Properties
`Model`	`Description`
`System`	`Description`
`Block`	Block parameter dialog box prompt properties
`Annotation`	`Text`
`Signal`	`Description`

  - `Show properties`: Specify a list of properties to report. Enter the names of object properties that you want the report to include for the modeling object you specified in the **Show current** field. Use this option to display properties that the Report Explorer does not include automatically.

Property names often differ from the Simulink dialog box prompts. Refer to the Simulink documentation to determine property names for blocks, signals, and other modeling objects. You can also use the MATLAB `get` command to determine the property names of an object. For example, to determine the property names of the block currently selected in a model, enter the following at the MATLAB command line:

```
get(get_param(gcb,'Handle'))
```

- **Show full path name**: Displays the full path of the selected Simulink model.
- **Display property names as prompts**: Displays property names as prompts in the generated report. The report includes the dialog box string instead of the underlying code property.

Display Options

- **Table title**: Displays a table title in the generated report.
  - `Name`: Automatically generates a title from the parameter.
  - `Custom`: Specifies a custom title.
  - `No title`: Does not include a title.
- **Header row**: Select a header row for the table in the generated report.
  - `No header`: Includes no header row.
  - `Type and Name`: Includes a header row with columns for name and object type.
  - `Custom`: Includes a custom header.
- **Don't display empty values**: Excludes empty parameters in the generated report.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sl.csl_auto_table`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `System Loop`

Simulink Data Dictionary

Report Simulink data dictionary information

Description

This component reports on the data dictionary currently active in the data dictionary loop specified by the Data Dictionary Loop component. Include this component as a child of a Simulink Data Dictionary Loop component.

Presentation Format

The report for a data dictionary includes a table that summarizes the properties of each variable in the dictionary. The report also includes a dictionary details section that fully reports the properties and value of each variable in the dictionary. If you use a conversion template to generate the report, you can specify template-defined styles for the summary table title and the summary table.

To use a conversion template, in the Report Options dialog box, set **File format** to one of the `from template` options, for example, `Direct PDF (from template)`.

- **Table title style name**: Specifies the style to use for the data dictionary table title. To specify the default style name `rgTableTitle`, which the default conversion template defines, use `Auto`. To specify a custom style defined in a custom template that you use with this report, select `Specify`.
- **Table style name**: Specifies the style to use for the data dictionary table. To specify the default table style name `rgUnruledTable`, which is the default conversion template defines, use `Auto`. To specify a custom style defined in a custom template that you use with this report, select `Specify`.

Options

You can specify whether to include dictionaries referenced by a dictionary and how to present the referenced information.

- **Include referenced data dictionaries**: Includes information from the data dictionaries that the dictionary currently active in the data dictionary loop specified by the Data Dictionary Loop component references. The referenced information displays at the end of the table for the referencing data dictionary, unless you select **Make separate table for each referenced dictionary**.
- **Make separate table for each referenced dictionary**: If you select **Include referenced data dictionaries**, display a table for each referenced data dictionary.
- **Include referenced dictionaries list**: If you select **Include referenced data dictionaries**, following the referencing data dictionary summary table, include a list of the referenced data dictionaries.

Sections to Report

You can specify the data dictionary sections to include data for.

- **Design Data** (default): Include information from the Design Data section of the current data dictionary.
- **Configuration**: Include information from the Configuration section of the current data dictionary.
- **Other Data**: Include information from the Other Data section of the current data dictionary.

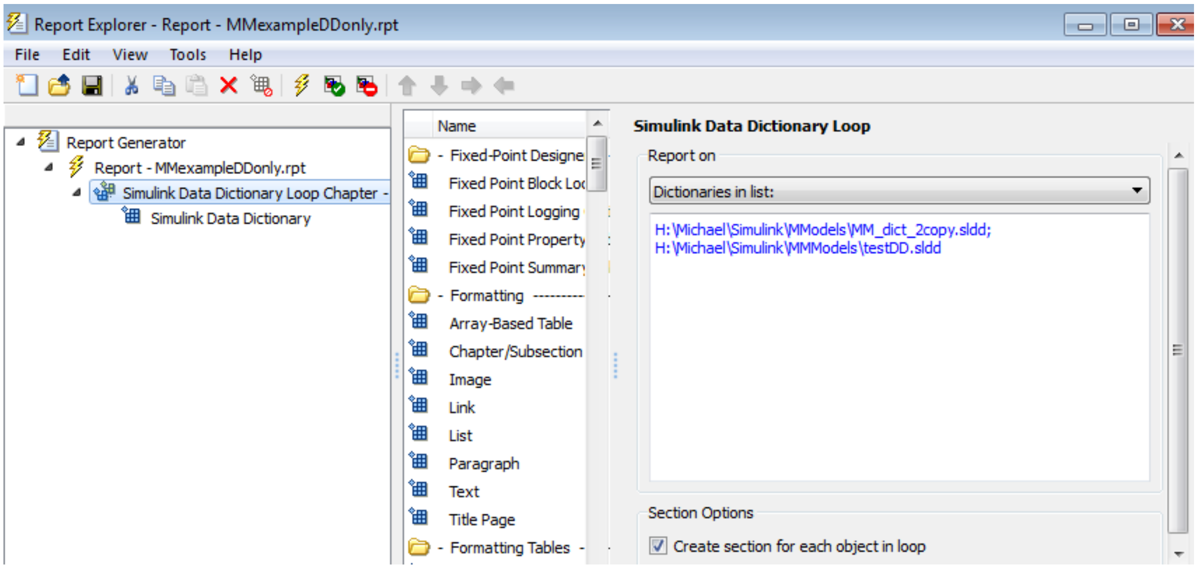
Fields to Report

The current dictionary summary table lists properties of the variables that it contains. The table always includes the variable name and value. In addition, it optionally includes these properties:

- **Data type**
- **Last modified**
- **Last modified by**
- **Status**
- **Referenced dictionary that contains data**

Example

Suppose that you configure an HTML report with the Simulink Data Dictionary Loop component.



Simulink Data Dictionary Loop

Report on

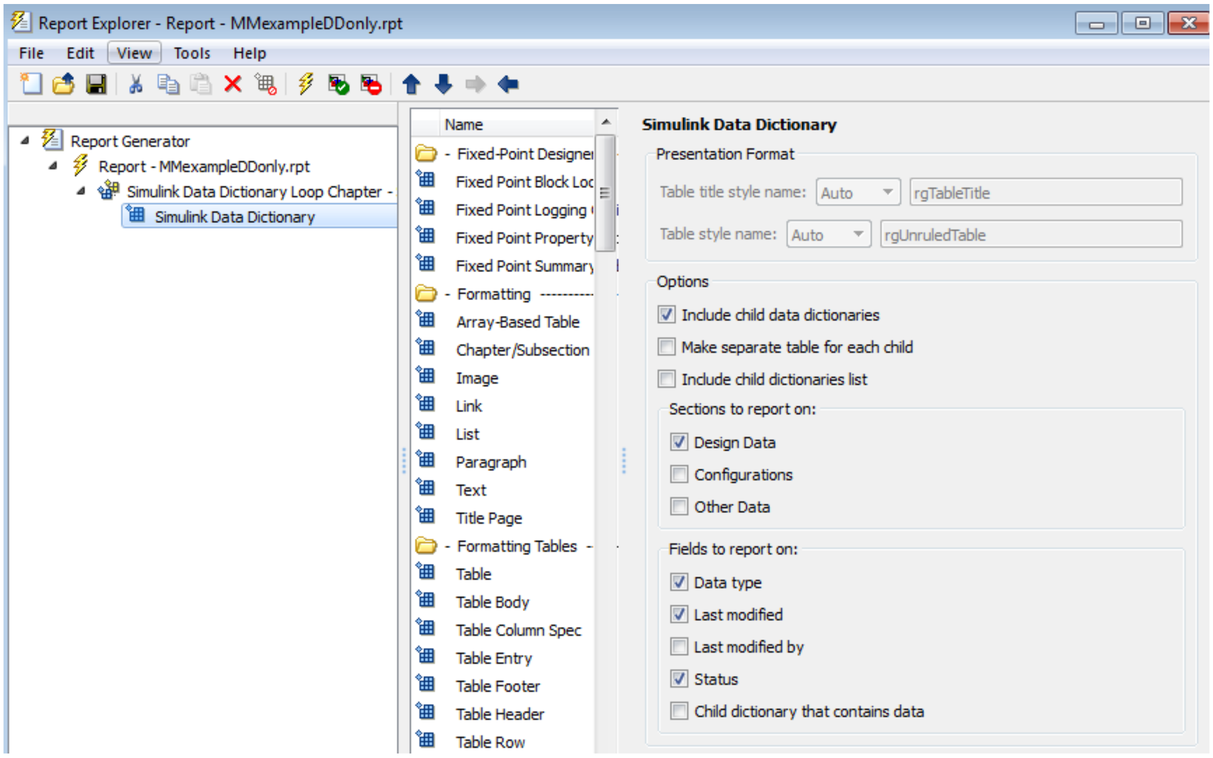
Dictionaries in list:

H:\Michael\Simulink\MModels\MM_dict_2copy.sldd;
H:\Michael\Simulink\MMModels\testDD.sldd

Section Options

[✓] Create section for each object in loop

Then you configure the Simulink Data Dictionary component.



Simulink Data Dictionary

Presentation Format

Table title style name: Auto rgTableTitle

Table style name: Auto rgUnruledTable

Options

- [✓] Include child data dictionaries
- [ ] Make separate table for each child
- [ ] Include child dictionaries list

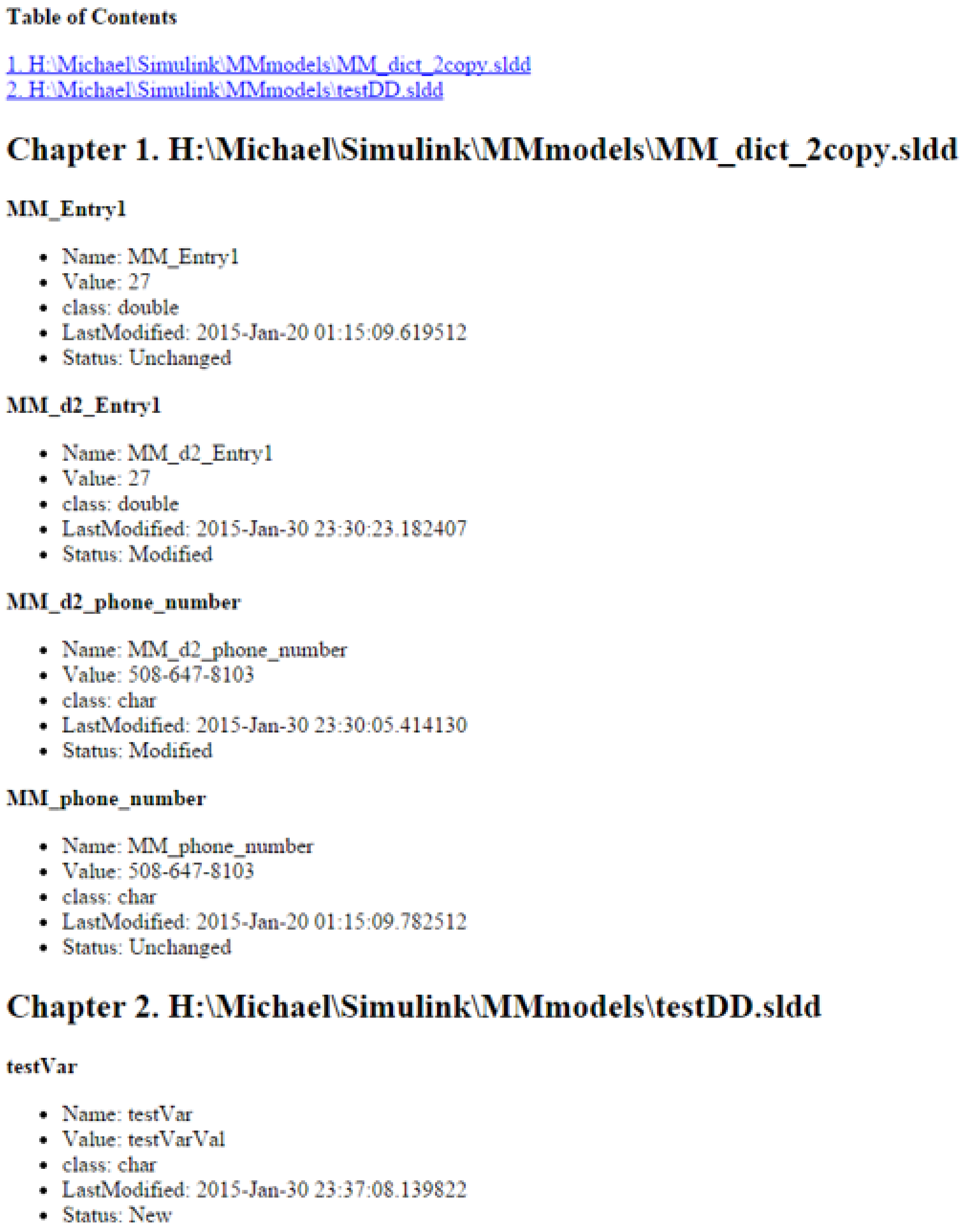
Sections to report on:

- [✓] Design Data
- [ ] Configurations
- [ ] Other Data

Fields to report on:

- [✓] Data type
- [✓] Last modified
- [ ] Last modified by
- [✓] Status
- [ ] Child dictionary that contains data

Here is the resulting report.



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1. H:\Michael\Simulink\MMmodels\MM_dict_2copy.sldd
2. H:\Michael\Simulink\MMmodels\testDD.sldd

Chapter 1. H:\Michael\Simulink\MMmodels\MM_dict_2copy.sldd

MM_Entry1

- Name: MM_Entry1
- Value: 27
- class: double
- LastModified: 2015-Jan-20 01:15:09.619512
- Status: Unchanged

MM_d2_Entry1

- Name: MM_d2_Entry1
- Value: 27
- class: double
- LastModified: 2015-Jan-30 23:30:23.182407
- Status: Modified

MM_d2_phone_number

- Name: MM_d2_phone_number
- Value: 508-647-8103
- class: char
- LastModified: 2015-Jan-30 23:30:05.414130
- Status: Modified

MM_phone_number

- Name: MM_phone_number
- Value: 508-647-8103
- class: char
- LastModified: 2015-Jan-20 01:15:09.782512
- Status: Unchanged

Chapter 2. H:\Michael\Simulink\MMmodels\testDD.sldd

testVar

- Name: testVar
- Value: testVarVal
- class: char
- LastModified: 2015-Jan-30 23:37:08.139822
- Status: New

Class

`rptgen_sl.csl_data_dictionary`

See Also

`Simulink Data Dictionary Loop`

Simulink Data Dictionary Loop

Run Simulink Data Dictionary child component for each Simulink data dictionary in specified context

Description

This component runs the Simulink Data Dictionary child component for each Simulink data dictionary in the specified context. You can specify whether to have each data dictionary in the loop.

Report on

Specify the data dictionaries to report on.

- `Dictionaries in MATLAB path`: Report on all data dictionaries on the MATLAB path. If you select **Include child data dictionaries**, then also reports on child data dictionaries whose parent is on the MATLAB path.
- `Dictionaries in list`: Report on all data dictionaries that you specify in the text box. Enter data dictionary names, separated by either a comma or semicolon. You can use multiple lines. If you do not specify the full path to a data dictionary, the loop includes that data dictionary only if the dictionary is on the MATLAB path.

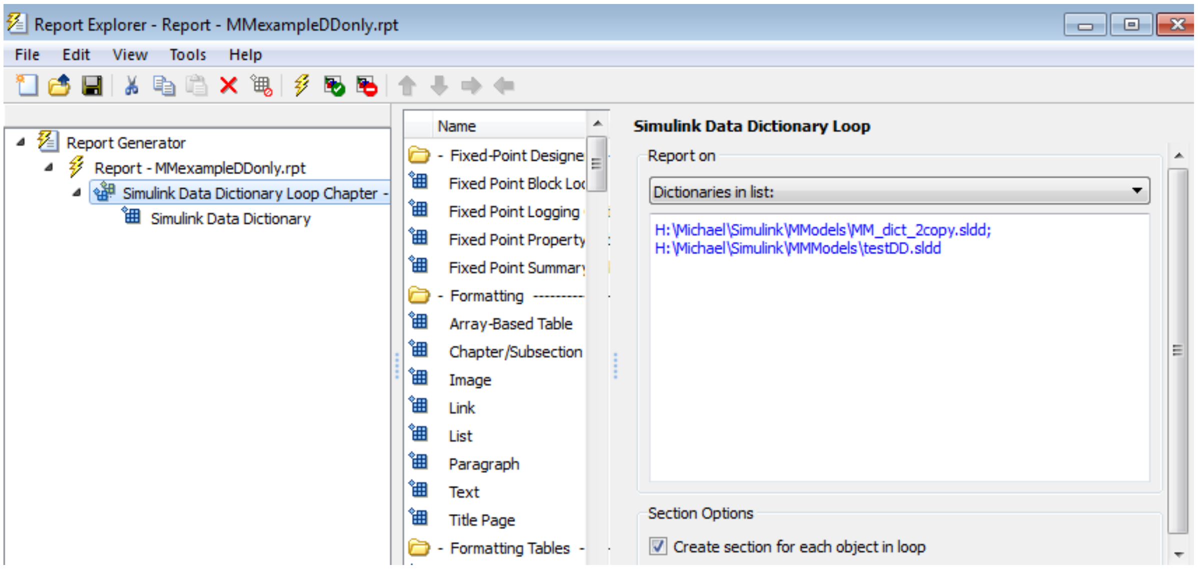
Use a Summary Table component to show annotation objects in reports. Each Summary Table component creates a single table with each reported annotation on a single row of the table.

Section Options

Create section for each object in loop: Create a separate chapter for each data dictionary.

Example

Suppose you have an HTML report with the Simulink Data Dictionary Loop component configured like this:

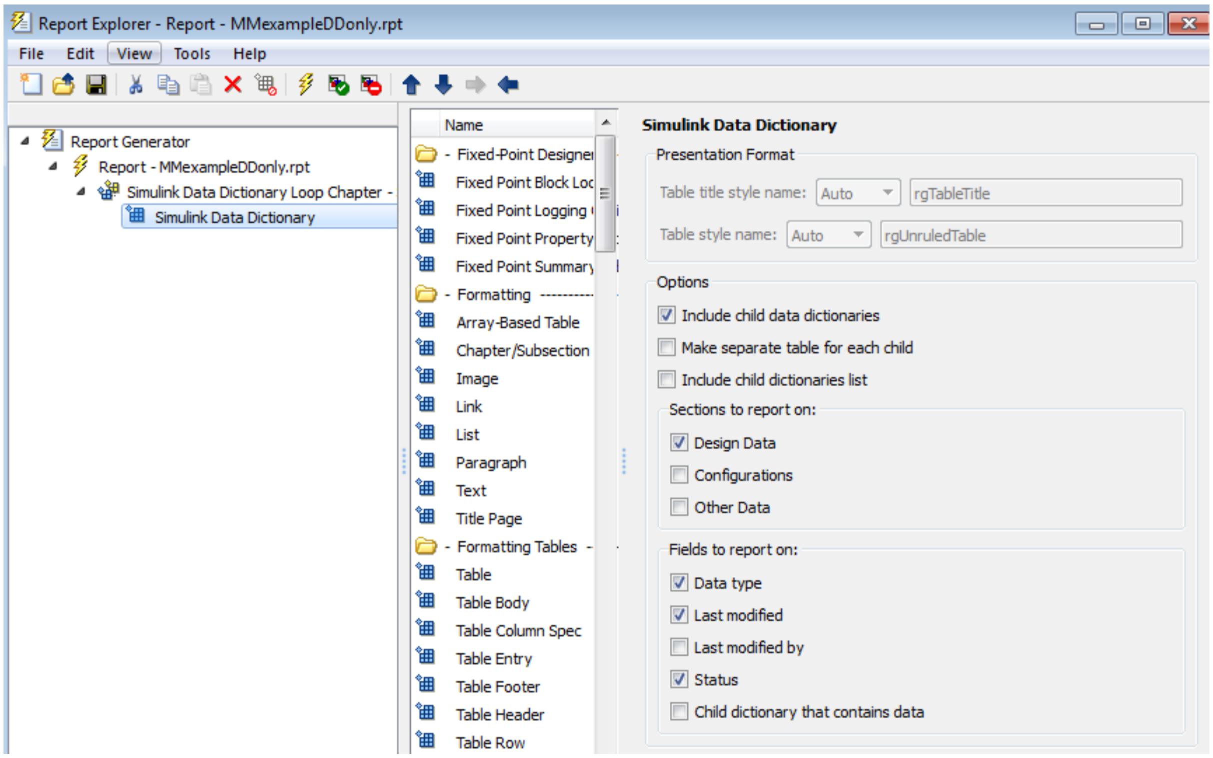


Dictionaries in list:

H:\Michael\Simulink\MModels\MM_dict_2copy.sldd;
H:\Michael\Simulink\MMModels\testDD.sldd

[✓] Create section for each object in loop

Then you configure the Simulink Data Dictionary component like this:



Report Generator
- Report - MMexampleDDonly.rpt
  - Simulink Data Dictionary Loop Chapter -
    - Simulink Data Dictionary

- Fixed-Point Designer
- Fixed Point Block Loc
- Fixed Point Logging
- Fixed Point Property
- Fixed Point Summary
- Formatting ---------
- Array-Based Table
- Chapter/Subsection
- Image
- Link
- List
- Paragraph
- Text
- Title Page
- Formatting Tables -
- Table
- Table Body
- Table Column Spec
- Table Entry
- Table Footer
- Table Header
- Table Row

Simulink Data Dictionary

Presentation Format

Table title style name: Auto rgTableTitle

Table style name: Auto rgUnruledTable

Options

[✓] Include child data dictionaries

[ ] Make separate table for each child

[ ] Include child dictionaries list

Sections to report on:

[✓] Design Data

[ ] Configurations

[ ] Other Data

Fields to report on:

[✓] Data type

[✓] Last modified

[ ] Last modified by

[✓] Status

[ ] Child dictionary that contains data

The resulting report looks like this:

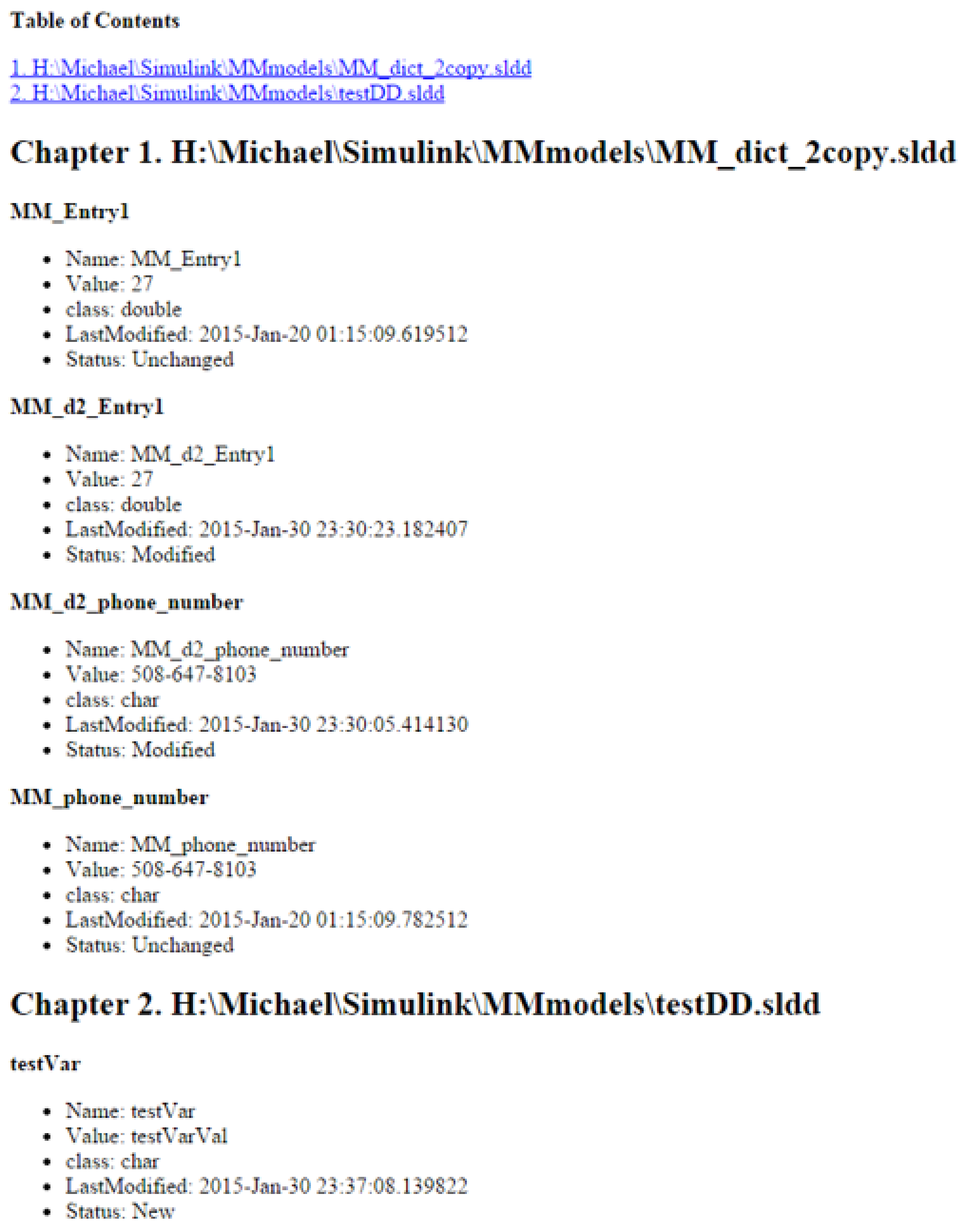


Table of Contents

Chapter 1. H:\Michael\Simulink\MMmodels\MM_dict_2copy.sldd

MM_Entry1

- Name: MM_Entry1
- Value: 27
- class: double
- LastModified: 2015-Jan-20 01:15:09.619512
- Status: Unchanged

MM_d2_Entry1

- Name: MM_d2_Entry1
- Value: 27
- class: double
- LastModified: 2015-Jan-30 23:30:23.182407
- Status: Modified

MM_d2_phone_number

- Name: MM_d2_phone_number
- Value: 508-647-8103
- class: char
- LastModified: 2015-Jan-30 23:30:05.414130
- Status: Modified

MM_phone_number

- Name: MM_phone_number
- Value: 508-647-8103
- class: char
- LastModified: 2015-Jan-20 01:15:09.782512
- Status: Unchanged

Chapter 2. H:\Michael\Simulink\MMmodels\testDD.sldd

testVar

- Name: testVar
- Value: testVarVal
- class: char
- LastModified: 2015-Jan-30 23:37:08.139822
- Status: New

Class

`rptgen_sl.csl_data_dict_loop`

See Also

`Simulink Data Dictionary`

Simulink Dialog Snapshot

Insert snapshots of Simulink editor dialog boxes

Description

This component takes snapshots of Simulink editor dialog boxes. You use it to display the current settings associated with an object or document the appearance of your custom mask dialog boxes.

The parent component of this component determines the behavior of this component.

- `Block Loop`: Documents the dialog box of the current reported block.
- `System Loop`: Documents the dialog box of the current reported system.

Format

- **Image file format**: Specifies the format for the snapshot image file. The **automatic** format chooses `BMP` format for PDF files, and `PNG` for other formats.
- **Show all tabs**: Automatically generates images for all the tabs for the dialog box. If you clear this check box, Simulink Report Generator creates an image of only the first tab.

Display Options

- **Scaling**: Controls size of the image, as displayed in a browser. Making an image larger using this option does not affect the storage size of the image, but the quality of the displayed image may decrease as you increase or decrease the size of the displayed image.

  Generally, to achieve the best and most predictable display results, use the default setting of `Use image size`.

  - `Use image size`: Causes the image to appear the same size in the report as on screen (default).
  - `Fixed size`: Specifies the number and type of units.

  - `Zoom`: Specifies the percentage, maximum size, and units of measure.
- **Size**: Specifies the size of the snapshot in the format `w h` (width, height). This field is active only if you choose `Fixed size` from the **Scaling** selection list.
- **Max size**: Specifies the maximum size of the snapshot in the format `w h` (width, height). This field is active only if you choose `Zoom` from the **Scaling** selection list.
- **Units**: Specifies the units for the size of the snapshot. This field is active only if you choose `Zoom` or `Fixed size` in the **Image size** list box.
- **Alignment**: Only reports in `PDF` or `RTF` format support this property.
  - `Auto`
  - `Right`
  - `Left`
  - `Center`
- **Title**: Specifies text to appear above the snapshot.
- **Caption**: Specifies text to appear under the snapshot.

Insert Anything into Report?

Yes. Snapshot.

Class

`rptgen_sl.CDialogSnapshot`

See Also

`Block Loop`, `System Loop`

Simulink Function System Loop

Report on Simulink functions specified in a Stateflow loop

Description

This component runs its child components for each Simulink function system defined by the parent component. For example, to include Simulink functions within a given model in the report, you can include this component as the child of a Stateflow `Object Loop` or `Object Loop` component, each of which in turn is usually a child of a `Chart Loop` component.

Report On

Include subsystems in nested Simulink functions: Specifies whether to include subsystems in nested Simulink functions. By default, this option is enabled.

Loop Options

- **Sort Systems**: Specifies how to sort systems.
  - `Alphabetically by system name` (default): Sorts systems alphabetically by name.
  - `By number of blocks in system`: Sorts systems by number of blocks. The list shows systems by decreasing number of blocks; that is, the system with the largest number of blocks appears first in the list.
  - `By system depth`: Sorts systems by their depth in the model.
  - `By traversal order`: Sorts systems in traversal order.
- **Search for**: Reports only on Subsystem blocks with the specified property name/property value pairs. To enable searching, click the check box. In the first row of the property name and property value table, click inside the edit box, delete the existing text, and type the property name and value.

  For information about subsystem property names and values, in “Block-Specific Parameters”, see the “Ports & Subsystems Library Block Parameters” section.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Number sections by system hierarchy**: Hierarchically numbers sections in the generated report. Requires that **Sort Systems** be set to `By traversal order`.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`rptgen_sl.csl_sys_loop`

See Also

`Object Loop`, `State Loop`, `Chart Loop`, `System Loop`, `Block Loop`, `Model Loop`, `Signal Loop`

Simulink Functions and Variables

Create table that displays workspace variables and MATLAB functions used by reported blocks in Simulink models

Description

This component creates a table that displays workspace variables and MATLAB functions used by blocks in a Simulink model. The `Model Loop` component specifies the current model and systems in which the blocks appear. For example, suppose a Simulink `Gain` block has a string `cos(x)` instead of a number. The Simulink software looks for a variable `x` in the workspace and uses the `cos` function.

Functions

- **Include table of functions**: Includes a table of Simulink functions in the generated report.
- **Table Title**: Specifies a title for the table in the generated report:
  - `Automatic`: Generates a title automatically from the parameter.
  - `Custom`: Specifies a custom title.
- **Parent block**: Includes a column in the table that includes the name of the block, which contains the reported variable.
- **Calling string**: Includes the MATLAB code that calls the reported variable.
- **Include fixed-point functions (sfix, ufix, ...)**: Includes Fixed-Point Designer functions in the report.

Variables

- **Include table of variables**: Includes a table of Simulink variables in the generated report.
- **Table title**: Specifies a title for the table in the generated report.
  - `Automatic`: Generates a title automatically from the parameter.
  - `Custom`: Specifies a custom title.

- **Include Workspace I/O parameters**: Reports on variables that contain parameters with time vectors and state matrices. Set these parameters in the **Workspace I/O** pane in the Simulation Parameters dialog box in a Simulink model.

  In the following table, if any of the entries in the first column are `on`, the component looks for the variable listed in the second column. If the component finds the variable in the workspace, it includes it in the report.

Parameter name	Variable name
`LoadExternalInput`	`ExternalInput`
`SaveTime`	`TimeSaveName`
`SaveState`	`StateSaveName`
`SaveOutput`	`OutputSaveName`
`LoadInitialState`	`InitialState`
`SaveFinalState`	`FinalStateName`

- **Parent block**: Includes the name of the block that contains the reported variable.
- **Calling string**: Includes the MATLAB code that calls the reported variable.
- **Size of variable**: Includes the size of the reported variable.
- **Class of variable**: Includes the variable class to which the reported variable belongs.
- **Memory size**: Includes the amount of memory in bytes that the reported variable needs.
- **Value in workspace**: Includes the value of the reported variable.

  Large arrays may appear as `[MxN CLASS]`. For example, if you have a 300-by-200 double array, it appears in the report as [`300x200 DOUBLE`].
- **Storage class**: Include the storage class of the reported variable.

  The title of this column is **Storage Class**. This option looks at the model's `TunableVars` property to see if any of the model variables specify their storage class. If you specify the storage class, `TunableVarsStorageClass` and `TunableVarsTypeQualifier` appear in a table column in the model variables table.

  The column entries are `TunableVarsStorageClass (TunableVarsTypeQualifier)` when `TunableVarsTypeQualifier` is not empty. If `TunableVarsTypeQualifier` is empty, the column entry is `TunableVarsStorageClass`.

Values for `TunableVarsStorageClass` include:

- `Exported Global`
- `Auto`
- `ImportedExtern`
- `ImportedExtern Pointer`

- **Data object properties**: For variables that are `Simulink.Parameter` data objects, includes the values of the object properties that you list in the edit box.

Example

This table is an example of a table created by the `Model Variables` component. This Property Table reports on the variables in the `Controller` in the `F14` model.

Variable Name	Parent Blocks	Calling String	Value
Ka	`f14/Controller/Gain3`	Ka	`0.677`
Kf	`f14/Controller/Gain`	Kf	`-1.746`
Ki	`f14/Controller/Proportional plus integral compensator`	[Ki]	`-3.864`
Kq	`f14/Controller/Gain2`	Kq	`0.8156`

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sl.csl_obj_fun_var`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `System Loop`

Simulink Library Information

Insert table that lists library links in the current model, system, or block

Description

This component inserts a table that lists library links in the current model, system, or block.

Table Columns

- **Block**: Includes the Simulink block name in the generated table.
- **Library**: Includes the Simulink library root name in the generated table.
- **Reference block**: Includes the Simulink reference block name in the generated table.
- **Link status**: Includes the link status in the generated table.

Display Options

- **Title**: Specifies a title for the generated report.
- **Sort table by**:
  - `Block`: Sorts the table by block name.
  - `Library`: Sorts the table by library name.
  - `Reference Block`: Sorts the table by reference block name.
  - `Link Status`: Sorts the table by link status.
- **Merge repeated rows**: Merges sorted rows in the generated table.

Example

The following table sorts based on `Reference Block` column. The Report Explorer uses the `aero_guidance` model with **Merge repeated rows** deselected to generate the table.

Block	Library	Reference Block	Status
Equations of Motion (Body Axes)	Aerospace	Equations of Motion (Body Axes)	resolved
Incidence & Airspeed	Aerospace	Incidence & Airspeed	resolved
Fin Actuator	Aerospace	2nd Order Nonlinear Actuator	resolved
3DoF Animation	Aerospace	3DoF Animation	resolved
Atmosphere	Aerospace	Atmosphere model	resolved
Cm	Simulink	Interpolation (n-D) using PreLookup	resolved
Cx	Simulink	Interpolation (n-D) using PreLookup	resolved
Cz	Simulink	Interpolation (n-D) using PreLookup	resolved
Kg	Simulink	Interpolation (n-D) using PreLookup	resolved
Ki	Simulink	Interpolation (n-D) using PreLookup	resolved
Alpha Index	Simulink	PreLookup Index Search	resolved
Mach Index	Simulink	PreLookup Index Search	resolved
Mach Index	Simulink	PreLookup Index Search	resolved
|Alpha| Index	Simulink	PreLookup Index Search	resolved

When you select **Merge repeated rows**, the generated table collapses rows in the `Block` column. Each row in the `Reference Block` column is unique, as shown in the following table.

Block	Library	Reference Block	Status
Equations of Motion (Body Axes)	Aerospace	Equations of Motion (Body Axes)	resolved

Block	Library	Reference Block	Status
Incidence & Airspeed	Aerospace	Incidence & Airspeed	resolved
Fin Actuator	Aerospace	2nd Order Nonlinear Actuator	resolved
3DoF Animation	Aerospace	3DoF Animation	resolved
Atmosphere	Aerospace	Atmosphere model	resolved
Cm Cx Cz Kg Ki	Simulink	Interpolation (n-D) using PreLookup	resolved
Alpha Index Mach Index Mach Index |Alpha| Index	Simulink	PreLookup Index Search	resolved

Insert Anything Into Report?

Yes. Table.

Class

`rptgen_sl.CLibinfo`

See Also

`Block Loop`, `Model Loop`, `System Loop`

Simulink Linking Anchor

Designate locations to which links point

Description

This component designates a location to which links point. Use the `Model Loop`, `System Loop`, `Block Loop`, or `Signal Loop` component as the parent component for this component.

Properties

- **Insert text**: Specifies text to appear after the linking anchor.
- **Link from current**: Sets the current model, system, block, or signal as the linking anchor.
  - `Automatic`: Automatically selects the appropriate model, system, block, or signal as a linking anchor. If the `Model Loop` component is the parent component, the linking anchor is set on the current model. Similarly, if the `Block Loop` or `Signal Loop` is the parent component, the linking anchor is inserted for the current system, block, or signal, respectively.
  - `Model`: Sets the linking anchor to the current model.
  - `System`: Sets the linking anchor to the current system.
  - `Block`: Sets the linking anchor to the current block.
  - `Annotation`: Sets the linking anchor to the current annotation.
  - `Signal`: Sets the linking anchor to the current signal.

Note: Use only one anchor per report each object. For more information, see the `Simulink Summary Table` component reference page.

Insert Anything into Report?

Yes. A link, and possibly text, depending on attribute choices.

Class

`rptgen_sl.csl_obj_anchor`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `System Loop`

Simulink Name

Insert name of a Simulink model, system, block, or signal into report

Description

This component inserts the name of a Simulink model, system, block, or signal into the report.

Using this component as the first child component of a `Chapter/Subsection` component allows the current Simulink model, system block, or signal name to be the chapter or section title.

Properties

- **Object type**
  - `Automatic`: Automatically selects the appropriate model, system, block, or signal name as the Simulink object name to include in the report. If the Model Loop component is the parent component, the object name is the current model name. If the System Loop, Block Loop, or Signal Loop is the parent component, then the object name is the name of the current system, block, or signal, respectively.
  - `Model`: Includes the current model name in the report.
  - `System`: Includes the current system name in the report.
  - `Block`: Includes the current block name in the report.
  - `Signal`: Includes the current signal name in the report. If the signal name is empty, the signal `<handle>`, which is a unique numerical identifier to that signal, appears in the report.
  - `Annotation`: Includes the current annotation name in the report.
- **Display name as**: Display the Simulink object name in the report.
  - `Name`: For example, `f14`
  - `Type Name`: For example, `Model f14`
  - `Type - Name`: For example, `Model - f14`
  - `Type: Name`: For example, `Model: f14`

- **Show full path name**: Displays the full path of a system or block. Choosing this option for a block causes the Simulink block name to appear as `<Model Name>/<System Name>/<Block Name>`.

Note: This option is not available for models or signals.

Insert Anything into Report?

Yes. Text.

Class

`rptgen_sl.csl_obj_name`

See Also

`Chapter/Subsection`

Simulink Property

Insert property name/property value pair for current Simulink model, system, block, or signal

Description

This component inserts a single property name/property value pair for the current Simulink model, system, block, or signal.

Simulink Object and Parameter

- **Object type**: Specifies the Simulink object type to include in the report.
  - `System`
  - `Model`
  - `Block`
  - `Signal`
  - `Annotation`
- **System parameter name**: Specifies a Simulink parameter name to include in the generated report:
  - If you select `Model` for **Object type**, this option appears as **Model parameter name**.
  - If you select `Block` for **Object type**, this option appears as **Block parameter name**.
  - If you select `Signal` for **Object type**, this option appears as **Signal parameter name**.

Display Options

- **Title**: Choose a title to display in the generated report:
  - `Automatic`: Uses the parameter name as the title.

    - `Custom`: Specifies a custom title.
    - `None`: Uses no title.
- **Size limit**: Limits the width of the display in the generated report. Units are in pixels. The size limit for a given table is equal to the hypotenuse of the table width and height [`sqrt(w^2+h^2)`]. The size limit for text is the number of characters squared. If you exceed the size limit, the variable appears in condensed form. Setting a size limit of zero always causes the variable to display, regardless of its size
- **Display as**: Specifies a display style.
    - `Auto table/paragraph`: Displays as a table or paragraph based on the information.
    - `Table`: Displays as a table.
    - `Paragraph`: Displays as a text paragraph.
    - `Inline text`: Displays as inline, which fits in line with the surrounding text.
- **Ignore if value is empty**: If the parameter is empty, the report excludes the parameter from the generated report.

Insert Anything into Report?

Yes. Text.

Class

`rptgen_sl.csl_property`

See Also

`Block Loop`, `Model Loop`, `System Loop`

Simulink Property Table

Insert table that reports on model-level property name/property value pairs

Description

This component inserts a table that reports on model-level property name/property value pairs.

Properties

Select Object: Choose the object for the Property Table in the generated report.

- `Model`
- `System`
- `Block`
- `Signal`
- `Annotation`

For more information about selecting object types in Property Table components, see "Select Object Types" on page 6-9.

Table

Select a preset table, which is already formatted and set up, in the preset table list in the upper-left corner of the attributes page.

- **Preset table**: Specifies the type of the object property table.
  - `Default`
  - `Simulation parameters`
  - `Version information`
  - `Simulink Coder information`

  - `Summary (req. Simulink Coder)`
  - `Blank 4x4`

  To apply a preset table, select the table and click **Apply**.
- **Split property/value cells**: Split property name/property value pairs into separate cells. For the property name and property value to appear in adjacent horizontal cells, select the **Split property/value cells** check box. In this case, the table is in split mode, so there is only one property name/property value pair per cell. If there is more than one name/property pair in a cell, only the first pair appears in the report. All subsequent pairs are ignored.

  For the property name and property value to appear together in one cell, clear the **Split property/value cells** check box. That setting specifies nonsplit mode. Nonsplit mode supports more than one property name/property value pair and text per cell.

  Before switching from nonsplit mode to split mode, make sure that there is only one property name/property value pair per table cell. If there is more than one property name/property value pair or text per cell, only the first property name/property value pair appears in the report. The report omits subsequent pairs and text.
- **Display outer border**: Displays the outer border of the table in the generated report.
- **Table Cells**: Specifies table properties to modify. The selection in this pane affects available fields in the **Cell Properties** pane.

Cell Properties

The options in this pane depend on the object selected in the **Table Cells** pane. If you select `%<Name> Information`, only **Contents** and **Show** appear. If you select any other object in the **Table Cells** pane, **Lower border** and **Right border** display.

- **Contents**: Enables you to change the contents of the table cell selected in the **Table Cells** pane.
- **Show as**: Specifies the format for the contents of the table cell.
  - `Value`
  - `Property Value`
  - `PROPERTY Value`

  - `Property: Value`
  - `PROPERTY: Value`
  - `Property - Value`
  - `PROPERTY - Value`
- **Alignment**: Specifies the alignment of the contents of the selected table cell in the **Table Cells** pane.
  - `Left`
  - `Center`
  - `Right`
  - `Double justified`
- **Lower border**: Displays the lower border of the table in the generated report.
- **Right border**: Displays the right border of the table in the generated report.

Creating Custom Tables

To create a custom table, edit a preset table, such as the `Blank 4x4` table. Add and delete rows and add properties. To open the Edit Table dialog box, click **Edit**.

For more information on creating custom property tables, see “Property Table Components” on page 6-6.

If the Simulink Coder software is not installed, `Summary (req Simulink Coder)` does not appear in this list. If you are using a report setup file that contains a summary property, the property name appears in the report, but the property value does not.

Example

The following report displays information on the `F14` model using the **Simulation Parameters** preset table.

Solver ode45	*ZeroCross* on	*StartTime* 0.0 *StopTime* 60
RelTol 1e-4	*AbsTol* 1e-6	*Refine* 1
InitialStep auto	*FixedStep* auto	*MaxStep* auto
LimitMaxRows off	*MaxRows* 1000	*Decimation* 1

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sl.csl_prop_table`

See Also

`Model Loop`, `Signal Loop`, `System Loop`

Simulink Sample Time

Insert title of Simulink sample time into report

Description

This component inserts a title for a Simulink sample time into the report.

Properties

- **Table Options**
  - **Title**: Specifies a title for the table in the generated report.
  - **Grid lines**: Show grid lines for the table.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sl.CSampleTime`

See Also

`Chapter/Subsection`

Simulink Summary Table

Properties or parameters of specified Simulink models, systems, blocks, or signals in table

Description

This component displays properties or parameters of selected Simulink models, systems, blocks, or signals in a table.

Object type

Choose the object type to display in the generated report.

- `Block` (Default)
- `Model`
- `System`
- `Signal`
- `Annotation`

The selected object type affects the options available in the **Property Columns** pane.

Table title

Choose a title to appear in the generated report:

- `Automatic`: Automatically generates a title from the parameter.
- `Custom`: Specifies a custom title.

Property Columns

This pane displays object properties to include in the Summary Table in the generated report.

- To add a property:

1. select the appropriate property level in the text box on the left.
2. In the text box on the right, select the property that you want to add and click **Add**.

- To delete a property, select the property name and click **Delete**.

`%<SplitDialogParameters>` is a unique property for Simulink Summary Tables, where the object type is `Block`. This property generates multiple summary tables, organized by block type. Each Summary Table group contains the dialog box parameters for that block.

Some entries in the list of available properties (such as `Depth`) are "virtual" properties that you cannot access using the `get_param` command. The properties used for property/value filtering in the block and System Loop components must be retrievable by the `get_param`. Therefore, you cannot configure your Summary Table to report on all blocks of `Depth` == 2.

You can create multiple values for a property in a Simulink Summary Table. For example, to report on blocks of type `Inport`, `Outport` and `Constant`:

1. Check the **Search for Simulink property name/property value pairs** box.
2. Make sure that you set **Property Name** to `BlockType`.
3. Type the following text into the **Property Value** field:

```
\<(Inport|Outport|Constant)\>
```

Remove empty columns: Removes empty columns from the table.

Transpose table: Changes the summary table rows into columns in the generated report, putting the property names in the first column and the values in the other columns.

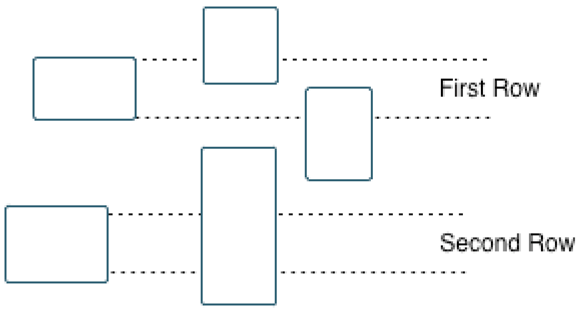
Object Rows

- **Insert anchor for each row**: Inserts an anchor for each row in the summary table.
- **Report On**:
  - `Automatic list from context`: Reports on all blocks in the current context, as set by the parent component.

- `Custom - use block list`: Reports on a list of specified blocks. Specify the full path of each block.

Loop Options

- **Sort blocks**
  - `Alphabetically by block name`: Sorts blocks alphabetically by name.
  - `Alphabetically by system name`: Sorts systems alphabetically by name. Lists blocks in each system, but in no particular order.
  - `Alphabetically by full Simulink path`: Sorts blocks alphabetically by Simulink path.
  - `By block type`: Sorts blocks alphabetically by block type.
  - `By block depth`: Sorts blocks by their depth in the model.
  - `By layout (left to right)`: Sorts blocks by their location in the model layout, by *rows*. The block appearing the furthest toward the left top corner of the model is the anchor for the row. The row contains all other blocks that overlap the horizontal area defined by the top and bottom edges of the anchor block. The other rows use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.



  - `By layout (top to bottom)`: Sorts blocks by their location in the model layout, by *columns*. The block appearing the furthest toward the left top corner of the model is the anchor for the column. The column contains all other blocks that overlap the vertical area defined by the left and right edges of the anchor block. The other columns use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.

- `By traversal order`: Sorts blocks by traversal order.
- `By simulation order`: Sorts blocks by execution order.
- `%<VariableName>`: Inserts the value of a variable from the MATLAB workspace. The `%<>` notation can denote a string or cell array. For more information, see `%<VariableName> Notation` on the `Text` component reference page.

- **Search for Simulink property name/property value pairs**: Reports on blocks with specified property name/property value pairs.

Example

Specify the following options to generate a Summary Table in a report for on the model `F14`:

- Sort on systems by system depth.
- Include the system parameters `Name` and `Block` in the table.

The following table appears in the report.

Name	Blocks
f14	u, Actuator Model, Aircraft Dynamics Model, Angle of Attack, Controller, Dryden Wind Gust Models, Gain, Gain1, Gain2, Gain5, More Info, More Info1, Nz pilot calculation, Pilot, Pilot G force Scope, Stick Input, Sum, Sum1, alpha (rad), Nz Pilot (g)
Aircraft Dynamics Model	Elevator Deflection d (deg), Vertical Gust wGust (ft/sec), Rotary Gust qGust (rad/sec), Gain3, Gain4, Gain5, Gain6, Sum1, Sum2, Transfer Fcn.1, Transfer Fcn.2, Vertical Velocity w (ft/s), Pitch Rate q (rad/s)
Controller	Stick Input (in), alpha (rad), q (rad/s), Alpha-sensor Low-pass Filter, Gain, Gain2, Gain3, Pitch Rate Lead Filter, Proportional plus integral compensator, Stick Prefilter, Sum, Sum1, Sum2, Elevator Command (deg)
Dryden Wind Gust Models	Band-Limited White Noise, Q-gust model, W-gust model, Wg, Qg
More Info	None

Name	Blocks
More Info1	None
Nz pilot calculation	w, q, Constant, Derivative, Derivative1, Gain1, Gain2, Product, Sum1, Pilot g force (g)

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sl.csl_summ_table`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `System LoopSimulink Function System Loop`

Simulink Workspace Variable

Report on workspace variables used in model, in loop generated by Simulink Workspace Variable Loop component

Description

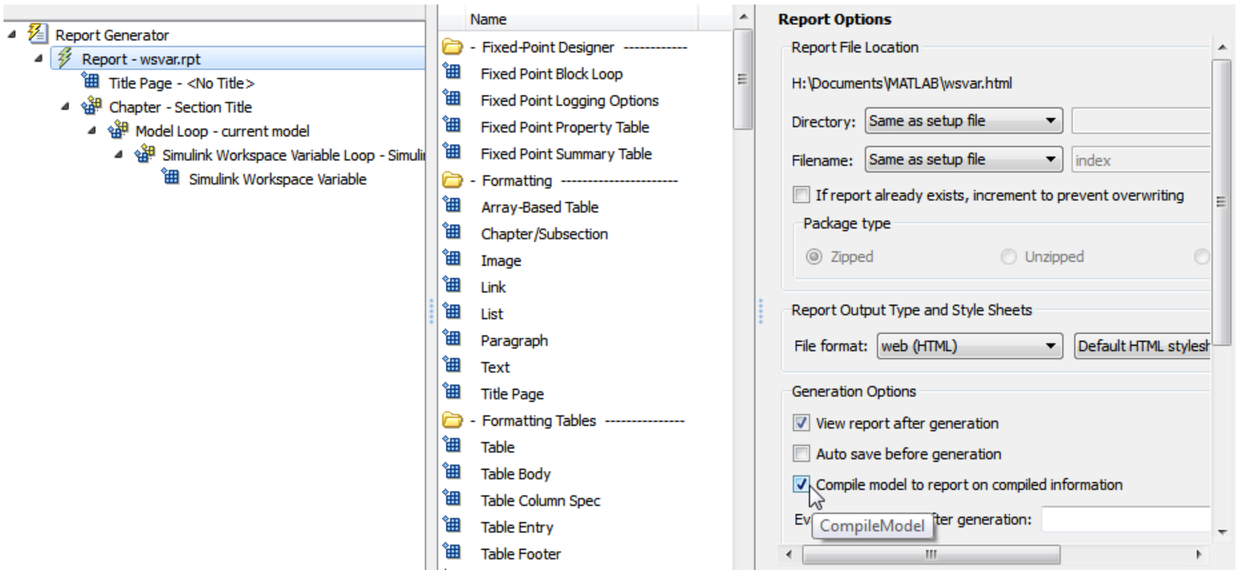
This component provides information about those workspace variables that the Simulink model uses, in a loop generated by a `Simulink Workspace Variable Loop` component. Your report setup must include `Simulink Workspace Variable` component as a child of a `Simulink Workspace Variable Loop` component.

The report includes the name and value each variable. Optionally, you can include the following information for each variable:

- Variable source (MATLAB workspace, model workspace, or data dictionary)
- Blocks that use the variable

For variables that are Simulink data objects (for example, a `Simulink.Parameter` object), the report includes the properties of the object. You can filter out properties to streamline the report.

Use a `Simulink Workspace Variable Loop` component as a parent for a `Simulink Workspace Variable` component. In the Report Options dialog box, select **Compile model to report on compiled information**.



Report Generator
- Report - wsvar.rpt
  - Title Page - <No Title>
  - Chapter - Section Title
    - Model Loop - current model
      - Simulink Workspace Variable Loop - Simuli
        - Simulink Workspace Variable

Name
- Fixed-Point Designer ------------
  - Fixed Point Block Loop
  - Fixed Point Logging Options
  - Fixed Point Property Table
  - Fixed Point Summary Table
- Formatting ---------------------
  - Array-Based Table
  - Chapter/Subsection
  - Image
  - Link
  - List
  - Paragraph
  - Text
  - Title Page
- Formatting Tables ---------------
  - Table
  - Table Body
  - Table Column Spec
  - Table Entry
  - Table Footer

Report Options

Report File Location

H:\Documents\MATLAB\wsvar.html

Directory: Same as setup file

Filename: Same as setup file | index

☐ If report already exists, increment to prevent overwriting

Package type: Zipped | Unzipped

Report Output Type and Style Sheets

File format: web (HTML) | Default HTML stylesh

Generation Options

☑ View report after generation

☐ Auto save before generation

☑ Compile model to report on compiled information

Ev[CompileModel]ter generation:

Options

The following options specify additional information that the report can include about each variable:

- **Show workspace**: Report the source of each variable — MATLAB workspace, model workspace, or data dictionary.
- **Show blocks that use variable**: Report the blocks that use each variable.

For variables whose values are Simulink data objects, you can filter the properties to include in the report, using one of the following approaches:

- Use the **Filter Properties** area of the dialog box to specify a standard filter.

  The standard filter options apply to all variables whose values are instances of the class or classes that you specify. For example, you can use a standard filter to filter out the `Description` property for all variables used by the model whose values use a `Simulink.Parameter` object.
- Select the **Use custom property filter** option and write MATLAB code for filtering.

Writing custom filtering code allows you to do kinds of filtering that the standard filter does not perform. Some common examples of custom filters that you might want to create are filters that filter out:

- A property for some, but not all, instances of a class
- Properties that match a regular expression

The **Filter Properties** area of the dialog box, where you specify a standard filter, has these fields.

- **Class name (* for all classes)**: Specify the class of the variables for which you want to filter out specific properties. You can specify one class at a time, or enter an asterisk (*) to specify all classes. After you enter the class name, move the cursor outside of the edit box.
- **Available Properties**: If the class that you entered in **Class name (* for all classes)** is on the MATLAB path, then this list displays the properties of that class.
- **Filtered Properties**: Displays the properties to filter out. Use the right-arrow button to add to the **Filtered Properties** list the properties that you selected in the **Available Properties** list.
- If the class that you enter is *not* on the MATLAB path, then a **Comma-separated list of properties to be filtered** edit box appears. Enter the names of properties to use for filtering.
- **Convert to Custom**: Generate custom MATLAB code that implements your **Filter Properties** standard filter settings.

Note: Selecting the **Convert to Custom** button overwrites any existing MATLAB custom filtering code for this component.

To create and apply custom filtering MATLAB code, select the **Use custom property filter** check box. Selecting this check box opens an edit box where you define a MATLAB function for filtering properties. The edit box includes a sample function (commented out) that you can use as a starting point for your filtering function. Use the `isFiltered` variable for the output of your function. For example:

- To filter out the `Owner` and `testProp` properties, in the edit box enter:

```
isFiltered = strcmpi(propertyName, 'Owner')||...
strcmpi(propertyName, 'testProp');
```

- To filter out all properties *except* for the `CoderInfo` property, in the edit box, enter:

  ```
  isFiltered = ~strcmpi(propertyName, 'CoderInfo');
  ```

If you clear the **Use custom property filter** check box, Simulink Report Generator saves your custom MATLAB filtering code, but does not use that code to filter properties.

Insert Anything into Report?

Yes. List.

Class

`rptgen_sl.csl_ws_variable`

See Also

`Simulink Workspace Variable Loop`, `Bus`, `Simulink Functions and Variables`

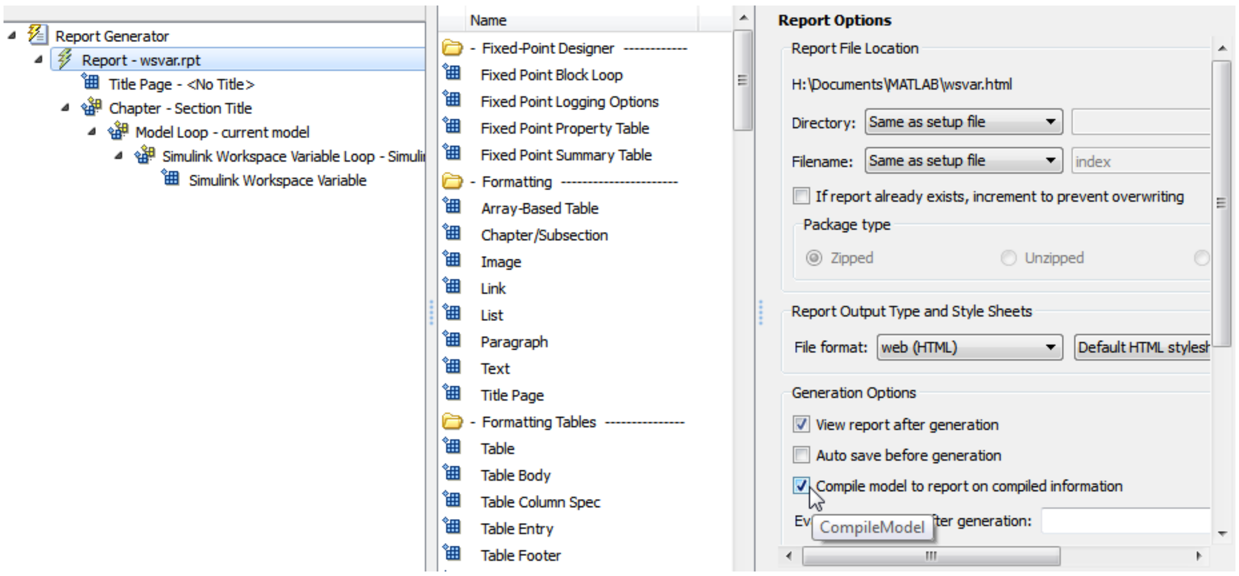
Simulink Workspace Variable Loop

Generates a model variable loop

Description

This component generates a model variable loop used by the `Simulink Workspace Variable` component to report on those workspace variables that the Simulink model uses.

You can limit the variables included in the loop to those that match property name and value pairs that you specify. If you want to report on model variables, your report setup file must include this component as a child of a `Model Loop` component and must include a `Simulink Workspace Variable` component as its child. Also, in the Report Options dialog box, select **Compile model to report on compiled information**. For example:



Report Generator
- Report - wsvar.rpt
  - Title Page - <No Title>
  - Chapter - Section Title
    - Model Loop - current model
      - Simulink Workspace Variable Loop - Simuli
        - Simulink Workspace Variable

Name
- Fixed-Point Designer ------------
Fixed Point Block Loop
Fixed Point Logging Options
Fixed Point Property Table
Fixed Point Summary Table
- Formatting ---------------------
Array-Based Table
Chapter/Subsection
Image
Link
List
Paragraph
Text
Title Page
- Formatting Tables ---------------
Table
Table Body
Table Column Spec
Table Entry
Table Footer

Report Options

Report File Location

H:\Documents\MATLAB\wsvar.html

Directory: Same as setup file

Filename: Same as setup file · index

☐ If report already exists, increment to prevent overwriting

Package type: [● Zipped] ○ Unzipped

Report Output Type and Style Sheets

File format: web (HTML) · Default HTML stylesh

Generation Options

☑ View report after generation

☐ Auto save before generation

☑ Compile model to report on compiled information

Ev... ...ter generation:

Loop Options

- **Sort**
  - `Alphabetically by text`: Sort variables alphabetically by name.
  - `By data type`: Sort variables alphabetically by data type.
- **Search for Simulink property name/property value pairs**: Reports on variables with specified property name/property value pairs.

Section Options

- **Create section for each object in loop**: Creates a separate section in the output for each variable.
  - If you specify to create a section for each variable, you can select the **Display the object type in the section title** to insert a variable name in each section title.
- **Create link anchor for each object in loop**: Specifies a custom title.

Insert Anything into Report?

Yes, inserts sections if you select the **Create section for each object in loop** option

Class

`rptgen_sl.csl_ws_var_loop`

See Also

`Simulink Workspace Variable`, `Bus`, `Simulink Functions and Variables`

State Loop

Run child components for all states in current context

Description

This component runs its children for all states in its context. The parent component of this component determines the context.

- `Model Loop`: Includes all states in the models.
- `System Loop`: Includes all states in the systems.
- `Machine Loop`: Includes all states in the machines.
- `Chart Loop`: Includes all states in the charts.
- `State Loop`: Includes all states in the current state.

For conditional processing based on states, you can use the `RptgenSF.getReportedState` function. For more information, see “Loop Context Functions” on page 6-24.

State Types

- **Include “and” and “or” states**: Includes `AND` and `OR` states in the loop.
- **Include “box” states**: Includes “box” states in the loop.
- **Include functions**: Includes “function” states in the loop.
- **Include truth tables**: Includes truth tables in the loop.
- **Include MATLAB functions**: Includes MATLAB functions in the loop.

Loop Options

- **Report depth**: Specifies the level on which to loop.
  - `Local children only`
  - `All objects`

- **Skip autogenerated charts under truth table**: Keeps autogenerated state objects under truth tables from appearing in the report.
- **Search Stateflow**: Indicates specific states to include in the loop.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report.

Insert Anything into Report?

Yes, section, if you select the **Create section for each object in loop** option.

Class

`rptgen_sf.csf_state_loop`

See Also

`Chart Loop`, `Machine Loop`, `Model Loop`, `State Loop`, `System Loop`, `Simulink Function System Loop`

State Transition Matrix

Inserts state transition matrix contents into report

Description

This component inserts the contents of state transition matrices into a report. A state transition matrix is an alternative view of a state transition table. In the state transition matrix, you can easily see how the state transition table reacts to each condition and event.

Options

- **Title**
  - `No title` (default): Report uses no title for the state transition matrix.
  - `Use Stateflow name`: For the title in the report, uses the names of the State Transition Table blocks from which the state transition matrices are generated.
  - `Custom`: In the text field, specify a custom name for the state transition matrix.
- **Display condition actions on matrix**: Include the state transition matrix condition actions. A condition action is an action that executes as soon as a condition evaluates to true. The condition action is part of a transition label.

Insert Anything into Report?

Yes, inserts state transition matrices and optionally, condition actions.

Class

`rptgen_sf_csf_statetransitionmatrix`

See Also

`State Transition Table`

State Transition Table

Inserts state transition tables into report

Description

This component inserts the state transition tables into a report. A state transition table is an alternative way of expressing sequential modal logic. Instead of drawing states and transitions graphically in a Stateflow® chart, you express the modal logic in tabular format.

Options

- **Title**
  - `No title` (default): Report uses no title for the state transition table.
  - `Use Stateflow name`: Uses the name of the State Transition Table block as the title.
  - `Custom`: In the text field, specify a custom name for the state transition table.

Insert Anything into Report?

Yes, inserts state transition table.

Class

`rptgen_sf_csf_statetransitiontable`

See Also

`State Transition Matrix`

Stateflow Automatic Table

Insert table with properties of current Stateflow object

Description

This component inserts a table that contains the properties of the current Stateflow object. Parents of this component can be:

- `Machine Loop`
- `State Loop`
- `Chart Loop`
- `Graphics Object Loop`

Display Options

- **Table title**: Specifies a title for the table in the generated report.
  - `No title`: Includes no title.
  - `Custom`: Includes a custom title.
  - `Name` (default): Uses an object name as the title.
    - `Object name`
    - `Object name with Stateflow path`
    - `Object name with Simulink and Stateflow path`
- **Header row**: Selects a header row for the table in the generated report.
  - `No header`: Includes no header row.
  - `Type and Name`: Includes a header row with columns for name and object type. When selected, this option creates a header row for the table with object name and type.
  - `Custom`: Includes a custom header.
- **Don't display empty values**: Excludes empty values from the generated report.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sf.csf_auto_table`

See Also

`Chart Loop`, `Graphics Object Loop`, `Machine Loop`, `State Loop`

Stateflow Count

Count number of Stateflow objects in current context

Description

This component counts the number of Stateflow objects in the current context.

Properties

- **Search depth**: Specifies the search depth for the count.
  - `Immediate children only` (default): Searches only children one level under the Stateflow object.
  - `All descendants`: Searches all children of the Stateflow object.
- **Sort results**: Specifies the sort method for the count results.
  - `Numerically decreasing by object count` (Default)
  - `Alphabetically increasing by object type`
- **Include a list of objects in table**: Inserts a column containing the counted objects.
- **Show total count**: Displays a total of counted objects.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sf.csf_count`

See Also

`State Loop`

Stateflow Dialog Snapshot

Insert snapshots of Stateflow editor dialog boxes

Description

This component reports on the current reported Stateflow dialog box object, depending on its context. If this component is the child of a `State Loop`, for example, the report includes information about the dialog box of the current State. Display the current settings associated with an object or document the appearance of your custom mask dialog boxes.

Format

- **Image file format**: Specifies the format for the snapshot image file. The `Automatic` format uses `BMP` format for PDF files and `PNG` for other formats.
- **Show all tabs**: Automatically generates images for all the tabs for the dialog box. If you clear this check box, the Simulink Report Generator software creates an image of only the first tab.

Display Options

- **Scaling**: Controls size of the image, as displayed in a browser. Making an image larger using this option does not affect the storage size of the image, but the quality of the displayed image may decrease as you increase or decrease the size of the displayed image.

  Generally, to achieve the best and most predictable display results, use the default setting of `Use image size`.

  - `Use image size`: Causes the image to appear the same size in the report as on screen (default).
  - `Fixed size`: Specifies the number and type of units.
  - `Zoom`: Specifies the percentage, maximum size, and units of measure.
- **Size**: Specifies the size of the snapshot in the form `w h` (width, height). This field is active only if you choose `Fixed size` in the **Scaling** selection list.

- **Max size**: Specifies the maximum size of the snapshot in the form `w h` (width, height). This field is active only if you choose `Zoom` in the **Scaling** selection list.
- **Units**: Specifies the units for the size of the snapshot. This field is active only if you choose `Zoom` or `Fixed size` in the **Image size** list box.
- **Alignment**: Aligns your snapshot. Only reports in `PDF` or `RTF` format support this property.
  - `Auto`
  - `Right`
  - `Center`
  - `Left`
- **Title**: Specifies text to appear above the snapshot.
- **Caption**: Specifies text to appear under the snapshot.

Insert Anything into Report?

Yes. Snapshot.

Class

`rptgen_sl.Cdialog boxesnapshot`

See Also

`State Loop`

Stateflow Filter

Run child components only if current object type matches specified object type

Description

This component runs its children only if the current object type, as set by its parent `Stateflow Hierarchy Loop`, matches the selected object type.

Properties

- **Object type**: Specifies the Stateflow object type to include in the report.
- **Run only if Stateflow object has at least the following number of Stateflow children**: Specifies a minimum number of children that a Stateflow object must have to include in the report.
- **Automatically insert linking anchor**: Inserts a linking anchor before the reported object. If an anchor for this object exists, this option does not create a second anchor.

Insert Anything into Report?

No.

Class

`rptgen_sf.csf_obj_filter`

See Also

`Stateflow Hierarchy Loop`

Stateflow Hierarchy

Provide visual representation of the hierarchy of a Stateflow object

Description

This component inserts a tree that shows the hierarchy of a given Stateflow object.

Tree Options

- **Construct tree from**: Specifies the object to use for the tree representation.
  - `Current object`
  - `Root of current object`: Starts reporting from the top of the hierarchy.
- **Emphasize current object in tree**: Highlights the current object in the tree representation.
- **Show number of parents**: Specifies the number of parents to include in the tree representation.
- **Show siblings**: Displays siblings in the tree representation.
- **Show children to depth**: Specifies the depth of children to display for each object in the tree representation.

Children

- **Show junctions**: Specifies the level of junction detail to display in the generated report.
  - `All`
  - `Non-redundant`
  - `None`
- **Show transitions**: Specifies the level of transition detail to display in the generated report.
  - `All`
  - `Labeled or non-redundant`

  - `Non-redundant`
  - `Labeled`
  - `None`
- **Skip autogenerated charts under truth tables**: Excludes autogenerated charts under truth tables.

List Formatting

- **List style**:
  - `Bulleted list`
  - `Numbered list`: Allows you to specify numbering options in the **Numbering style** section.
    - **Numbering style**: Allows you to specify a numbering style. This setting supports only the `RTF/DOC` report format.
      - `1,2,3,4...`
      - `a,b,c,d...`
      - `A,B,C,D...`
      - `i,ii,iii,iv...`
      - `I,II,III,IV...`

      To show the parent number in each list entry, select `Show parent number in nested list (1.1.a)`. To show only the current number or letter, select `Show only current list value (a)`.

Insert Anything into Report?

Yes. Tree graphic.

Class

`rptgen_sf.csf_hier`

See Also

`Stateflow Hierarchy Loop`

Stateflow Hierarchy Loop

Run child components on Stateflow object hierarchy

Description

This component runs its child components on the Stateflow object hierarchy.

Loop Options

- **Minimum legible font size**: Specifies the minimum font size to use in the report. The default font size, 8, is the smallest recommended font size.
- **Skip autogenerated charts under truth tables**; Excludes autogenerated charts under truth tables in the report.
- **Search Stateflow**: Reports on Stateflow charts with specified property name/ property value pairs.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report.

Insert Anything into Report?

No.

Class

`rptgen_sf.csf_hier_loop`

See Also

`Stateflow Hierarchy`

Stateflow Linking Anchor

Designate locations to which links point

Description

This component designates a location to which other links point. The linking anchor is set to the current object, as defined by the parent component.

This component must have the `Chart Loop`, `State Loop`, `Machine Loop`, or `Stateflow Filter` component as its parent.

Properties

Insert text: Specifies text to appear after the linking anchor.

Insert Anything into Report?

Yes. A link, and possibly text, depending on attribute choices.

Class

`rptgen_sf.csf_obj_anchor`

See Also

`Chart Loop`, `Machine Loop`, `State Loop`, `Stateflow Filter`,

Stateflow Name

Insert into report name of Stateflow object specified by parent component

Description

This component inserts the name of the Stateflow object, as defined by its parent component, into the report. This component must have the `State Loop`, `Chart Loop`, or `Stateflow Filter` component as its parent.

Using this component as the first child component of a `Chapter/Subsection` component allows the current Stateflow object name to be the chapter or section title.

Properties

- **Display name as**: Displays the Stateflow object name in the report.
  - `Name`: For example, `Object`
  - `Type Name`: For example, `Object <ObjectName>`
  - `Type - Name`: For example, `Object - <ObjectName>`
  - `Type: Name`: For example, `Object: <ObjectName>`
- **Display name as**: Specifies the level of detail with which the Stateflow object name displays the report.
  - `Object name`
  - `Object name with Stateflow path`
  - `Object name with Simulink and Stateflow path`

Insert Anything into Report?

Yes. Text.

Class

`rptgen_sf.csf_obj_name`

See Also

`Chapter/Subsection`, `Chart Loop`, `State Loop`, `Stateflow Filter`

Stateflow Property

Insert into report table, text, or paragraph with information on selected Stateflow object property

Description

This component inserts a table, text, or paragraph that contains details of the selected Stateflow object property.

Property to Display

Property name: Specifies the Stateflow property name to display.

Display Options

- **Title**: Specifies a title to display in the generated report.
  - `Automatic`: Uses the parameter name as the title.
  - `Custom`: Specifies a custom title.
  - `None`: Specifies no title.
- **Size limit**: Specifies the width of the display in the generated report. Units are in pixels. The size limit for a given table is the hypotenuse of the width and height of the table, `sqrt(w^2+h^2)`. The size limit for text is the number of characters squared. If you exceed the size limit, the variable appears in condensed form.

  Setting a size limit of `0` always displays the variable in long form, regardless of its size.
- **Display as**: Specifies a display style from the menu.
  - `Auto table/paragraph` (default): Displays as a table or paragraph based on the information.
  - `Table`: Displays as a table.
  - `Paragraph`: Displays as a text paragraph.

  - `Inline text`: Displays in line with the surrounding text.
- **Ignore if value is empty**: Excludes empty parameters from the generated report.

Insert Anything into Report?

Yes. Text, paragraph, or table.

Class

`rptgen_sf.csf_property`

See Also

`Paragraph`, `Table`, `Text`, `Stateflow Name`

Stateflow Property Table

Insert into report property-value table for Stateflow object

Description

This component inserts a property-value table for a Stateflow object into the report. Use the `Stateflow Filter` component as the parent of this component.

For more information on working with Property Table components, see “Property Table Components” on page 6-6.

Table

Select a preset table, which is already formatted and set up, in the preset table list in the upper-left corner of the attributes page.

- **preset table**: Specifies a type of table to display the object property table.
  - `Default`
  - `Machine`
  - `Chart`
  - `State`
  - `Truth table`
  - `EM function`
  - `Data`
  - `Event`
  - `Junction`

  To apply a preset table, select the table and click **Apply**.
- **Split property/value cells**: Splits property name/property value pairs into separate cells.
  - For the property name and property value to appear in adjacent horizontal cells, select the **Split property/value cells** check box. In this case, the table is in split

  mode, there is only one property name/property value pair per cell. If there is more than one name/property pair in a cell, only the first pair appears in the report. The report ignores all subsequent pairs.
  - For the property name and property value to appear together in one cell, clear the **Split property/value cells** check box. This setting is nonsplit mode. Nonsplit mode supports more than one property name/property value pair and text.
  - Before switching from nonsplit mode to split mode, make sure that there is only one property name/property value pair per table cell. When there is more than one property name/property value pair or any text in a given cell, only the first property name/property value pair appears in the report. The report omits subsequent pairs and text.
- **Display outer border**: Displays the outer border of the table in the generated report.
- **Table Cells**: Specifies table properties to modify. The selection in this pane affects the available fields in the **Cell Properties** pane.

Cell Properties

The options in the **Title Properties** pane depend on the object selected in the **Table Cells** pane. If you select `%<Name>`, only **Contents** and **Show** appear. If you select any other object in the **Table Cells** pane, **Lower border** and **Right border** appear.

- **Contents**: Modifies the contents of the table cell selected in the **Table Cells** pane.
- **Alignment**: Justifies the contents of the selected table cell in the **Table Cells** pane.
  - `Left`
  - `Center`
  - `Right`
  - `Double justified`
- **Show As**: Specifies the format for the contents of the table cell.
  - `Value`
  - `Property Value`
  - `PROPERTY Value`
  - `Property: Value`

  - `PROPERTY: Value`
  - `Property - Value`
  - `PROPERTY - Value`
- **Lower border**: Displays the lower border of the table in the generated report.
- **Right border**: Displays the right border of the table in the generated report.

Creating Custom Tables

You can edit a preset table, such as the `Blank 4x4` table, to create a custom table. Add and delete rows and add properties. To open the Edit Table dialog box, click **Edit**.

For details about creating custom property tables, see "Property Table Components" on page 6-6.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sf.csf_prop_table`

See Also

`Stateflow Filter`

Stateflow Snapshot

Insert into report snapshot of Stateflow object

Description

This component inserts a snapshot of a Stateflow object, defined by the `Stateflow Filter` parent component, into the report.

This component only executes if the selected object in the `Stateflow Filter` component is a graphical object, such as `Chart`, `State`, `Transition`, and `Frame`.

Snapshot

- **Image file format**: Specifies the image file format (for example, `JPEG` or `TIFF`). Select `Automatic SF Format` (default) to choose the format best suited for the specified report output format automatically. Otherwise, choose an image format that your output viewer can read.
  - `Automatic SF Format` (uses the file format selected in the Preferences dialog box)
  - `Bitmap (16m-color)`
  - `Bitmap (256-color)`
  - `Black and white encapsulated PostScript`
  - `Black and white encapsulated PostScript (TIFF)`
  - `Black and white encapsulated PostScript2`
  - `Black and white encapsulated PostScript2 (TIFF)`
  - `Black and white PostScript`
  - `Black and white PostScript2`
  - `Color encapsulated PostScript`
  - `Color encapsulated PostScript (TIFF)`
  - `Color encapsulated PostScript2`
  - `Color encapsulated PostScript2 (TIFF)`

  - `Color PostScript`
  - `Color PostScript2`
  - `JPEG high quality image`
  - `JPEG medium quality image`
  - `JPEG low quality image`
  - `PNG 24-bit image`
  - `Scalable vector graphics (SVG)`
  - `TIFF - compressed`
  - `TIFF - uncompressed`
  - `Windows metafile`
- **Paper orientation**:
  - `Portrait`
  - `Landscape`
  - `Rotated`
  - `Largest dimension vertical`: Positions the image so that its largest dimension is vertical.
  - `Use Chart PaperOrientation setting`: Uses the paper orientation setting for the chart. Use the Simulink `PaperOrientation` parameter to specify the orientation.
  - `Full page image (PDF only)`: In PDF reports, scales images to fit the full page, minimizes page margins, and maximizes the size of the image by using either a portrait or landscape orientation.

  For more information about paper orientation, see the `orient` command in the MATLAB documentation.
- **Image sizing**:
  - `Shrink image to minimum font size specified in Stateflow Hierarchy Loop`: Resizes the image so that the text label font size is the minimum font size.
  - `Fixed` and `Zoom`: Specifies the size of the image.
- **Scaling**: Specifies the percentage of the image size to which to scale it.

- **Maximum size**: Specifies the maximum size for the snapshot in the generated report in the selected units. Use `[width, height]` format. In the units text box, select `Inches`, `Centimeters`, `Points`, or `Normalized`.
- **Use printframe**: Inserts a frame around your image. Use the default frame or create a custom one.
- **Use printframe paper settings**: Uses the dimensions and parameters as set by the specified **printframe** to size your image. If you choose this option, all other options (except for **Image file format**) become inactive.

Properties

- **Include callouts to describe visible objects**: Displays descriptive callouts for visible objects.
- **Insert anchors for transitions and junctions**: Inserts anchors for transitions and junctions into the report.
  - `None`
  - `Redundant children only`
  - `All`
- **Run only if Stateflow object has at least the following number of children**: Specifies the minimum number of children that the current Stateflow object must have to include in the report. This option is inactive unless the selected object in the parent `Stateflow Filter` component is a graphical object.

Tip This option allows you to exclude certain images to decrease the size of the report for large models.

Display Options

- **Scaling**:
  - `Use image size`: Uses the image size that you specify in the snapshot option.
  - `Zoom` and `Fixed size`: Allows you to specify the size of the image.
- **Size**: Specifies a size in inches for your image. The default is `7`-by-`9`.

- **Max size**: Specifies the maximum size of the snapshot in the format `w h` (width, height). This field is active only if you choose `Zoom` from the **Scaling** selection list.
- **Units**: Specifies the units for the size of the snapshot. This field is active only if you choose `Zoom` or `Fixed size` in the **Image size** list box.
- **Alignment**: Only reports in `PDF` or `RTF` format support this property.
  - `Auto`
  - `Right`
  - `Center`
  - `Left`
- **Image title**:
  - `None`(Default).
  - `Object name`: Uses the object name as the title.
  - `Full Stateflow name`: Specifies the Stateflow path and the name of the object.
  - `Full Simulink + Stateflow name`: Specifies the Simulink path and name of the object.
  - `Custom`: Enter a different title.
- **Caption**: Specifies a caption for your image.
  - `None`(Default).
  - `Custom`: Specifies a custom caption.
  - `Description`: Sets the caption to the value of the object `Description` property.

Insert Anything into Report?

Yes. Image.

Class

`rptgen_sf.csf_obj_snap`

Class

`rptgen_sf.csf_prop_table`

See Also

`Stateflow Filter`

Stateflow Summary Table

Table of properties or parameters of specified Stateflow object

Description

This component displays a table of properties or parameters of specified Stateflow objects. It can have the following parents:

- Any Stateflow looping component
- Any Simulink looping component (`Model Loop`, `System Loop`, `Block Loop`, or `Signal Loop`)

Properties

- **Object type**: Specifies the object type to display in the generated report. This value affects the options available in the **Property Columns** pane.
- **Table title**: Specifies a title for the Summary Table in the generated report.
  - `Automatic`: Generates a title automatically from the parameter.
  - `Custom`: Specifies a custom title.

Property Columns

- **Property columns**: Displays the object properties to include in the Summary Table in the generated report.
  - To add a property:
    - Select the appropriate property level in the text box.
    - In the context list under the text box, select the property that you want to add and click **Add**.
  - To delete a property, select the property name and press the **Delete** key.

  Some entries in the list of available properties (such as `Depth`) are "virtual" properties that you cannot access using the `get_param` command. The properties used for property/value filtering in the block and System Loop components must be retrievable by the `get_param`. Therefore, you cannot configure your Summary Table to report on all blocks of `Depth` == 2.

- **Remove empty columns**: Removes empty columns from the Summary Table in the generated report.
- **Transpose table**: Changes the summary table rows into columns in the generated report, putting the property names in the first column and the values in the other columns.

Object Rows

Insert anchor for each row: Inserts an anchor for each row in the summary table.

Report On

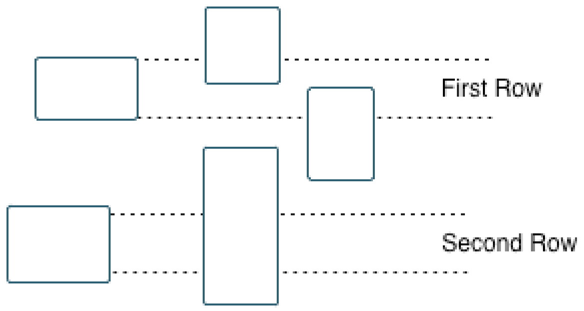
- **Automatic list from context**: Reports on all blocks in the current context, as set by the parent component.
- **Custom - use block list**: Reports on a specified list of blocks. Specify the full path of each block.

Loop Options

Choose block sorting options and reporting options in this pane.

- **Sort blocks**: Specifies how to sort blocks (applied to each level in a model):
  - `Alphabetically by block name`: Sorts blocks alphabetically by name.
  - `Alphabetically by system name`: Sorts systems alphabetically by name. Lists blocks in each system, but in no particular order.
  - `Alphabetically by full Simulink path`: Sorts blocks alphabetically by Simulink path.
  - `By block type`: Sorts blocks alphabetically by block type.
  - `By block depth`: Sorts blocks by their depth in the model.
  - `By layout (left to right)`: Sorts blocks by their location in the model layout, by *rows*. The block appearing the furthest toward the left top corner of the

model is the anchor for the row. The row contains all other blocks that overlap the horizontal area defined by the top and bottom edges of the anchor block. The other rows use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.



    - `By layout (top to bottom)`: Sorts blocks by their location in the model layout, by *columns*. The block appearing the furthest toward the left top corner of the model is the anchor for the column. The column contains all other blocks that overlap the vertical area defined by the left and right edges of the anchor block. The other columns use the same algorithm, using as the anchor the next unreported block nearest the left top of the model.
    - `By traversal order`: Sorts blocks by traversal order.
    - `By simulation order`: Sorts blocks by execution order.
- **Search for Simulink property name/property value pairs**: Reports on blocks with specified property name/property value pairs.
- **Search Stateflow**: Reports on Stateflow charts with specified property name/ property value pairs.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sf.csf_summ_table`

See Also

`Block Loop`, `Chart Loop`, `Model Loop`, `Object Loop`, `Signal Loop`, `State Loop`, `Stateflow Hierarchy Loop`, `System Loop`

System Filter

Run child components if current system meets specified conditions

Description

This component runs its child components if the current system meets the conditions that you specify with this component.

Properties

- **Report only if system has at least N blocks**: Specifies the minimum number of blocks that the system must include for any of the child components to run. If you enter `0`, child components run regardless of the number of blocks in the system.
- **Report only if system has at least N subsystems**: Specifies the minimum number of subsystems that the system must include for the child components to run. If you enter `0`, child components run regardless of the number of subsystems in the system.
- **Report only if system mask type is**: Specifies which masks to include in the generated report.
  - `Either masked or unmasked`
  - `Masked`
  - `Unmasked`
- **Custom filtering MATLAB code**: Specifies custom MATLAB filtering code that the System Filter applies when determining which systems and subsystems to report on in a System Loop component. The edit box includes a sample function (commented out) that you can use as a starting point for your own filtering function. Use the `isFiltered` variable for the output of your function. For example, to filter out systems and subsystems whose names start with `engine`, enter:

  ```
  isFiltered = strncmpi( currentSystem, 'engine', 6);
  ```

Insert Anything into Report?

No.

Class

`rptgen_sf.csf_obj_filter`

See Also

`System Loop`

System Hierarchy

Create nested list that shows hierarchy of specified system

Description

This component creates a nested list that shows the hierarchy of a specified system. The list can display all systems in a model, or the parents and children of the current system.

Starting System

- **Build list from**: Specifies the system or model from which to build the list.
  - `Current system`
  - `Current model`
- **Emphasize current system**: Highlights the current system or model in the generated report.

Display Systems

- **Show number of parents**: Specifies the number of parents to list.
- **Display peers of current system**: Shows the peers of the current system in the generated report.
- **Show children to depth**: Specifies the depth of children to list.

List Formatting

- **List style**:
  - `Bulleted list`
  - `Numbered list`: Allows you to select numbering options in the **Numbering style** section.

- **Numbering style**: Allows you to select a numbering style in the selection list, by setting **List style** to `Numbered List`. Only the `RTF/DOC` report format supports this option.
  - `1,2,3,4,...`
  - `a,b,c,d,...`
  - `A,B,C,D,...`
  - `i,ii,iii,iv,...`
  - `I,II,III,IV,...`

Insert Anything into Report?

Yes. List.

Class

`rptgen_sl.csl_sys_list`

See Also

`Model Loop`, `System Loop`

System Loop

Specify systems and subsystems on which to loop, as defined by parent component

Description

This component runs its child components for each system defined by the parent component. For example, to include systems and subsystems within a given model in the report, you can include this component as the child of a `Model Loop` component.

For conditional processing systems, you can use the `RptgenSL.getReportedSystem` function. For more information, see “Loop Context Functions” on page 6-24.

Report On

- **Loop on Systems**:
  - **Select systems automatically**: Reports on all systems in the current context as set by the parent component.
    - `Model Loop`: Reports on systems in the current model.
    - `System Loop`: Reports on the current system.
    - `Signal Loop`: Reports on the parent system of the current signal.
    - `Block Loop`: Reports on the parent system of the current block.

    If this component does not have any of these components as its parent, selecting this option reports on all systems in all models.
- **Custom - use system list**: Reports on a list of specified systems. Specify the full path of each system.
- `%<VariableName>`: Inserts the value of a variable from the MATLAB workspace. The `%<>` notation can denote a string or cell array. For more information, see `%<VariableName> Notation` on the `Text` component reference page.
- **Include subsystems in Simulink functions**: Specifies whether to include subsystems in Simulink functions. By default, this option is enabled.

Loop Options

- **Sort Systems**: Specifies how to sort systems.
  - `Alphabetically by system name` (default): Sorts systems alphabetically by name.
  - `By number of blocks in system`: Sorts systems by number of blocks. The list shows systems by decreasing number of blocks; that is, the system with the largest number of blocks appears first in the list.
  - `By system depth`: Sorts systems by their depth in the model.
  - `By traversal order`: Sorts systems in traversal order.
- **Search for**: Reports only on blocks with the specified property name/property value pairs. To enable searching, click the check box. In the first row of the property name and property value table, click inside the edit box, delete the existing text, and type the property name and value. To add a row, use the **Add row** button ().

  For information about subsystem property names and values, in “Block-Specific Parameters”, see the “Ports & Subsystems Library Block Parameters” section.

Section Options

- **Create section for each object in loop**: Inserts a section in the generated report for each object found in the loop.
- **Display the object type in the section title**: Inserts the object type automatically into the section title in the generated report.
- **Number sections by system hierarchy**: Hierarchically numbers sections in the generated report. Requires that **Sort Systems** be set to `By traversal order`.
- **Create link anchor for each object in loop**: Creates a hyperlink to the object in the generated report.

Examples

For an example of how to use this component with a `Model Loop` as its parent, see `Model Loop`.

Insert Anything into Report?

Yes, inserts a section if you select the **Create section for each object in loop** option.

Class

`rptgen_sl.csl_sys_loop`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `System Loop`

System Snapshot

Insert snapshot of the current system into report

Description

This component inserts a snapshot of the current system into the report. The Snapshot options control how the image file is stored. The Properties options control whether the image display includes callouts and a print frame. The Display options control how the image is displayed in a browser.

You can create a `System Snapshot` component only within a `Model Loop` hierarchy, that is, as a child of `Model Loop` or of any of its descendents.

Snapshot Options

- **Format**: Specifies the image file format (for example, `JPEG` or `TIFF`). Select `Automatic SL Format` (the default) to choose the format best suited for the specified report output format automatically. Otherwise, choose an image format that your output viewer can read.
  - `Automatic SL Format` (uses file format selected in the Preferences dialog box)
  - `Bitmap (16m-color)`
  - `Bitmap (256-color)`
  - `Black and white encapsulated PostScript`
  - `Black and white encapsulated PostScript (TIFF)`
  - `Black and white encapsulated PostScript2`
  - `Black and white encapsulated PostScript2 (TIFF)`
  - `Black and white PostScript`
  - `Black and white PostScript2`
  - `Color encapsulated PostScript`
  - `Color encapsulated PostScript (TIFF)`
  - `Color encapsulated PostScript2`

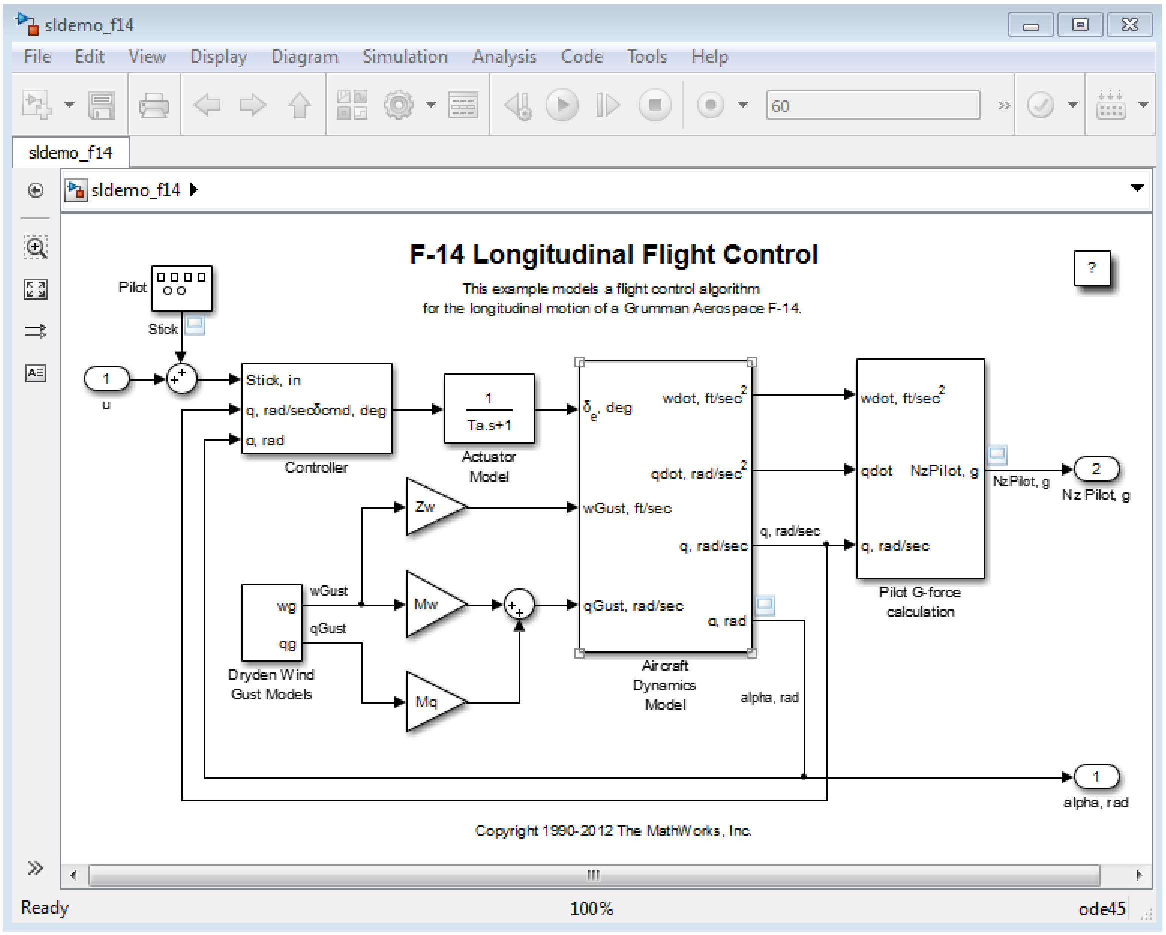
   - `Color encapsulated PostScript2 (TIFF)`
   - `Color PostScript`
   - `Color PostScript2`
   - `JPEG high quality image`
   - `JPEG low quality image`
   - `JPEG medium quality image`
   - `PNG (screenshot)`
   - `PNG 24-bit image`
   - `Scalable Vector Graphics`
   - `Windows metafile`
- **Orientation**:
   - `Largest dimension vertical`: Positions the image so that its largest dimension is vertical.
   - `Landscape`
   - `Portrait`
   - `Use system orientation`: Uses the paper orientation setting for the system. Use the Simulink `PaperOrientation` parameter to specify the orientation.
   - `Full page image (PDF only)`: In PDF reports, scales images to fit the full page, minimizes page margins, and maximizes the size of the image by using either a portrait or landscape orientation.
- **Scaling**: Controls the size of the image in the image file.
   - `Automatic` (default): Automatically scales the image to output dimensions.
   - `Custom`: Specifies image size.
   - `Zoom`: Enlarges or reduces the image size to the percent that you specify. Use **Max Size** to specify the maximum size other than the default for the image.

Note: Selecting the **Use printframe** deactivates the `Custom` and `Zoom` options and automatically scales the image to the print frame size.

Properties Options

- **Include callouts to describe visible objects**: Displays descriptive callouts for visible objects
- **Use printframe**: Prints a frame around the image. You can use the default frame, `rptdefaultframe.fig`, or use the Frame Editor to build a custom frame. For more information, see the `frameedit` function in Simulink documentation.

  The default frame is five inches wide and four inches high. It includes the name of the system and the model folder. This frame is optimized for use with a `portrait` paper orientation. The Flight Control Model in the `f14` Simulink model appears here with the default Simulink Report Generator frame option.



Display Options

To access the display options, click the **Advanced** button.

- **Scaling**: Controls size of the image, as displayed in a browser. Making an image larger using this option does not affect the storage size of the image, but the quality of the displayed image may decrease as you increase or decrease the size of the displayed image.

Generally, to achieve the best and most predictable display results, use the default setting of `Use image size`.

  - `Use image size`: Causes the image to appear the same size in the report as on screen (default).
  - `Fixed size`: Specifies the number and type of units.
  - `Zoom`: Specifies the percentage, maximum size, and units of measure.
- **Size**: Specifies the size of the snapshot in a browser, using the format `w h` (width, height). This field is active only if you choose `Fixed size` in the **Scaling** selection list.
- **Max size**: Specifies the maximum size of the snapshot in a browser, using the format `w h` (width, height). This field is active only if you choose `Zoom` in the **Scaling** selection list.
- **Units**: Specifies the units for the size of the snapshot in a browser. This field is active only if you choose `Fixed size` in the **Image size** list box.
- **Alignment**: Only reports in `PDF` or `RTF` format support this property.
  - `Auto`
  - `Right`
  - `Left`
  - `Center`
- **Image title**:
  - `None` (Default)
  - `System name`: Uses the system name as the image name.
  - `Full system name`: Uses the system name, with path information, as the image name.
  - `Custom`: Specifies a custom title.
- **Caption**:
  - `None` (Default)
  - `Description (use system description)`
  - `Custom`: Specifies a custom caption.

Insert Anything into Report?

Yes. Image.

Class

`rptgen_sl.csl_sys_snap`

See Also

`System Loop`

Test Sequence

Capture Test Sequence block information

Description

This component captures information about Simulink Test™ Test Sequence blocks. The report includes the test sequence using the tabular series of steps from the Test Sequence block.

Test Sequence Block Section Title

Title to use for the Test Sequence block section:

- `Use Test Sequence name` (default): Use the name of the Test Sequence block as the section title.
- `Custom`: Specify a custom section title in the text box.

Step Content

Select the step content to include in the report.

- **Include description, action, and transition table** (default): Include all the step data in the report, i.e., step descriptions, action statements, transition table, and when condition.
- **Include description only**: Include only the description of each step in the report.
- **Include action and transition table only**: Include the action statements, transition table, and when condition in the report.
- **None**: Do not include the description, action, or transition table in the report.
- **Include requirements**: Include links to requirements that are attached to steps in the `Test Sequence` block.

Insert Anything into Report?

Yes. Test Sequence block name or specified title and optional step information.

Class

`rptgen_stm.cstm_testseq`

To Workspace Plot

Capture plot figure created in the MATLAB workspace

Description

This component captures a plot figure created in the MATLAB workspace, and then inserts one or both of the following into the report:

- A table that includes input and output numeric values.
- A figure that plots the values included in the table.

Print Options

- **Image file format**: Specifies the image file format (for example, `JPEG` or `TIFF`) from this list. Select `Automatic HG Format` (the default) to choose the format best suited for the specified report output format automatically. Otherwise, choose an image format that your output viewer can read. Other options are:
  - `Automatic HG Format` (Uses the file format selected in the Preferences dialog box)
  - `Bitmap (16m-color)`
  - `Bitmap (256-color)`
  - `Black and white encapsulated PostScript`
  - `Black and white encapsulated PostScript (TIFF)`
  - `Black and white encapsulated PostScript2`
  - `Black and white encapsulated PostScript2 (TIFF)`
  - `Black and white PostScript`
  - `Black and white PostScript2`
  - `Color encapsulated PostScript`
  - `Color encapsulated PostScript (TIFF)`
  - `Color encapsulated PostScript2`
  - `Color encapsulated PostScript2 (TIFF)`

  - `Color PostScript`
  - `Color PostScript2`
  - `JPEG high quality image`
  - `JPEG medium quality image`
  - `JPEG low quality image`
  - `PNG 24-bit image`
  - `TIFF - compressed`
  - `TIFF - uncompressed`
  - `Windows metafile`

- **Paper orientation**:
  - `Landscape`
  - `Portrait`
  - `Rotated`
  - `Use figure orientation`: Uses the orientation for the figure, which you set with the `orient` command.
  - `Full page image (PDF only)`: In PDF reports, scales images to fit the full page, minimizes page margins, and maximizes the size of the image by using either a portrait or landscape orientation.

  For more information about paper orientation, see the `orient` command in the MATLAB documentation.

- **Image size**:
  - `Use figure PaperPositionMode setting`: Uses the `PaperPositionMode` property of the Handle Graphics figure to set the image size in the report. For more information about paper position mode, see the `orient` command in the MATLAB documentation.
  - `Automatic (same size as on screen)`: Sets the image in the report to the same size as it appears on the screen.
  - `Custom`: Specifies a custom image size. Specify the image size in the `size` and `units` fields.

- **Size**: Specifies the size of the Handle Graphics figure snapshot in the format `wxh` (width times height). This field is active only if you choose `Custom` in the **Image size** list box.
- **Units**: Specifies units for the size of the Handle Graphics figure snapshot. This field is active only if you choose `Set image size` in the **Custom** list box.
- **Invert hardcopy**: Uses the Handle Graphics figures `InvertHardcopy` property, which inverts colors for printing; it changes dark colors to light colors, and light colors to dark colors.
  - `Automatic`: Automatically changes dark axes colors to light axes colors. If the axes color is a light color, it is unchanged.
  - `Invert`: Changes dark axes colors to light axes colors, and light axes colors to dark axes colors.
  - `Don't invert`: Retains image colors displayed on screen in the printed report.
  - `Use figure's InvertHardcopy setting`: Uses the `InvertHardcopy` property set in the Handle Graphics image.
  - `Make figure background transparent`: Makes the image background transparent.

Display Options

- **Scaling**: Controls size of the image, as displayed in a browser. Making an image larger using this option does not affect the storage size of the image, but the quality of the displayed image may decrease as you increase or decrease the size of the displayed image.

  Generally, to achieve the best and most predictable display results, use the default setting of `Use image size`.
  - `Use image size`: Causes the image to appear the same size in the report as on screen (default).
  - `Fixed size`: Specifies the number and type of units.
  - `Zoom`: Specifies the percentage, maximum size, and units of measure.
- **Size**: Specifies the size of the snapshot in the format `w h` (width, height). This field is active only if you choose `Fixed size` in the **Scaling** list.

- **Max size**: Specifies the maximum size of the snapshot in the format `w h` (width, height). This field is active only if you choose `Zoom` from the **Scaling** list.
- **Units**: Specifies units for the size of the snapshot. This field is active only if you choose `Zoom` or `Fixed size` in the **Image size** list box.
- **Alignment**: Only reports in `PDF` or `RTF` format support this property.
  - `Auto`
  - `Right`
  - `Left`
  - `Center`
- **Title**: Specifies text to appear above the snapshot.
- **Caption**: Specifies text to appear under the snapshot.

Insert Anything into Report?

Yes. Figure.

Class

`rptgen_sl.csl_blk_toworkspace`

See Also

`Figure Loop`

Truth Table

Report on truth tables in Simulink and Stateflow models

Description

The Truth Table component reports on truth tables in Simulink and Stateflow models. It displays both the condition table and the action table. The parent component of the Truth Table determines its behavior.

- `Model Loop`: Reports on all truth tables in the current model.
- `System Loop`: Reports on all truth tables in the current system.
- `Block Loop` : Reports on all truth tables in the current block.
- `Signal Loop`: Reports on all truth tables in the current signal.

Title

Title: Specifies a title for the truth table.

- `No title`
- `Use Stateflow name`
- `Custom`

Condition Table

Specify display parameters for the condition table.

- **Show header**: Displays the column headers in the table.
- **Show number**: Displays the condition number column in the table.
- **Show condition**: Displays the condition column in the table.
- **Show description**: Displays the description column in the table.
- **Wrap if column count**: Specifies how many columns to display before creating a table continuation. If the specified number is greater than the number of columns that can appear on the page, some columns do not appear in the report.

Action Table

- **Show header**: Displays the column headers in the table.
- **Show number**: Displays the condition number column in the table.
- **Show condition**: Displays the condition column in the table.
- **Show description**: Displays the description column in the table. If you do not select this option, no action table appears in the report.

Insert Anything into Report?

Yes. Table.

Class

`rptgen_sf.csf_truthtable`

See Also

`Block Loop`, `Model Loop`, `Signal Loop`, `System Loop`

9

Functions – Alphabetical List

report

Generate report from specified Simulink system

Syntax

```
report
report (filename,...)
report (___,-oOPATH)
report (___,-fFORMAT)
report (___,-genOption1,...)
[report1, report2, ...] = report (rptfile1, rptfile2, ...)
```

Description

- `report` with no arguments opens the Report Explorer. For more information on the Report Explorer, see "Working with the Report Explorer"
- `report (filename,...)` generates a report from the specified report setup files. You can specify one or more report setup files. When specifying the name of the report setup file, omit the `.rpt` file name extension.
- `report (___,-oOPATH)` sets the name of the generated report. You can specify a path or a single file name for the `OPATH` path argument.
- `report (___,-fFORMAT)` sets the output format and file name extension of the generated report. Supported formats include:
  - Adobe Acrobat PDF (`.pdf`)
  - HTML (`.html`)
  - Microsoft Word (`.doc`)
  - Rich Text format (`.rtf`)

  For example, `report('simple-report','-fPDF)` generates a PDF file.
- `report (___,-genOption1,...)` specifies one or more of the following report generation options:
  - `-noview` — Prevents launching the file viewer

  - `-graphical` — Shows hierarchy in Report Explorer
  - `-debug` — Enables debug mode
  - `-quiet` — Sets error echo level to `0`
  - `-sSTYLESHEETNAME` — Sets stylesheet name (not required when choosing format)
- `[report1, report2, ...] = report (rptfile1, rptfile2, ...)` returns the names of the generated reports. If the MATLAB Report Generator software cannot generate a given report, its returned name is empty.

Examples

Example 1: Setting the format of the generated report

- Generate the report `testrpt` in `PDF` format:

  ```
  report testrpt -fpdf
  ```
- Generate the report `testrpt` in `RTF` format:

  ```
  report testrpt -frtf
  ```
- Generate the report `testrpt` in Microsoft Word format:

  ```
  report testrpt -fdoc
  ```

  Note: Only Microsoft Windows platforms support this option.
- Generate a multipage `HTML` report from the `figloop-tutorial` report setup file:

  ```
  report figloop-tutorial -fhtml -shtml-!MultiPage
  ```

Example 2: Specifying the file and path of the generated report

Generate a report named `simple-report` in the folder `/tmp/index.html`:

```
report ('simple-report','-o/tmp/index.html')
```

More About

- “Generate Reports”

See Also

`setedit` | `rptconvert` | `rptlist` | `compwiz`

rptlist

Return list of all reports in MATLAB path

Syntax

```
rptlist
rptlist ('system_name')
list = rptlist
```

Description

`rptlist` with no arguments opens the Report Explorer, which lists available report setup files in the MATLAB path. You can open, run, or associate these files with the current Simulink system.

`rptlist ('system_name')` opens the Report Explorer with the Simulink system's `ReportName` property selected.

`list = rptlist` returns a list of report setup files in the MATLAB path.

See Also

`report` | `setedit` | `rptconvert` | `compwiz`

slwebview

Export Simulink models to Web views

Syntax

```
slwebview
filename = slwebview(system_name)
filename = slwebview(system_name,Name,Value)
```

Description

`slwebview` starts the Web View dialog box in the Report Explorer.

`filename = slwebview(system_name)` exports the subsystem `system_name` and its child systems to the file `filename`.

`filename = slwebview(system_name,Name,Value)` provides additional options specified by one or more Name,Value pairs.

Examples

Export Web View for a Subsystem and Systems that Contain that Subsystem

Open the fuel rate controller subsystem.

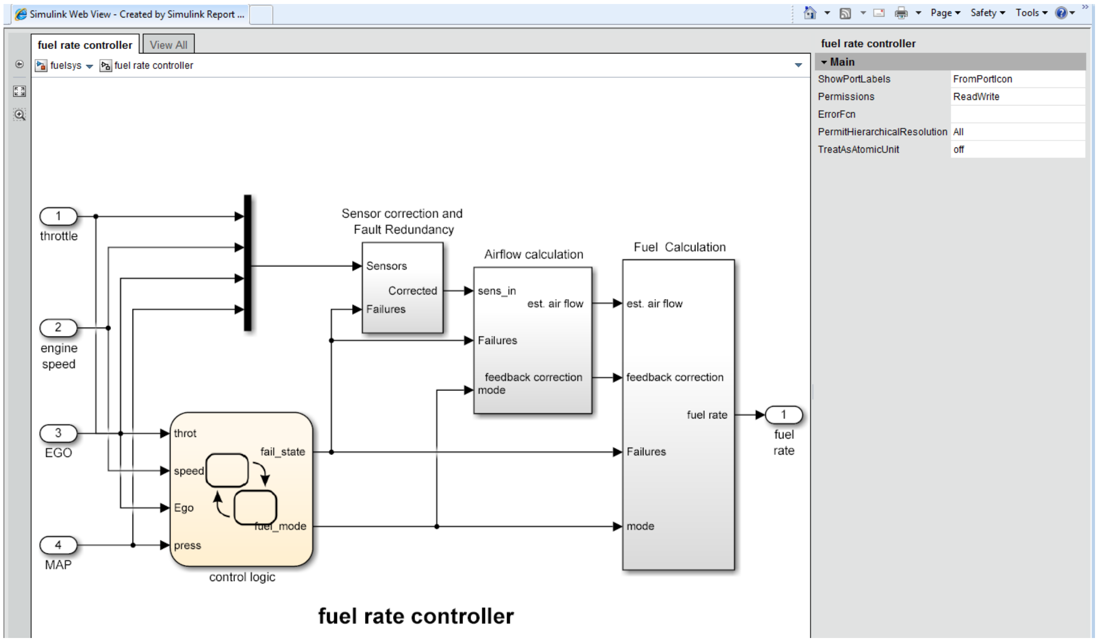
```
open_system('fuelsys')
```

Export to a Web view the fuel rate controller subsystem and the system that contains it. Do not export the subsystems that it contains. This example assumes the current folder is the `H:` drive.

```
fuelsys_web_view = slwebview...
('fuelsys/fuel rate controller','SearchScope','CurrentAndAbove')
```

```
fuelsys_web_view =
H:\fuel_rate_controller\webview.html
```

The Web view displays in the system browser.



fuel rate controller

Main

ShowPortLabels	FromPortIcon
Permissions	ReadWrite
ErrorFcn	
PermitHierarchicalResolution	All
TreatAsAtomicUnit	off

Export Web View with Access to Referenced Models

Open the `sldemo_mdlref_depgraph` model.

```
open_system('sldemo_mdlref_depgraph')
```

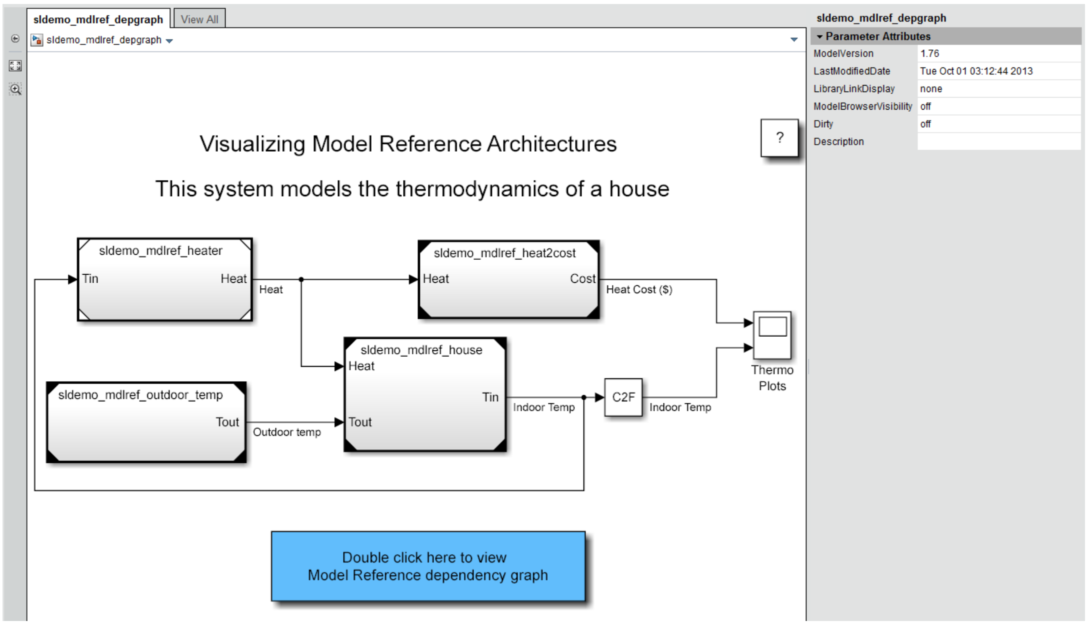
Export to a Web view the `sldemo_mdlref_depgraph` model and allow access to the models it references.

```
depgraph_web_view = slwebview...
('sldemo_mdlref_depgraph','FollowModelReference','on')
```

```
depgraph_web_view =

H:\sldemo_mdlref_depgraph\webview.html
```

The Web view displays in the system browser. In the Web view, you can open the models referenced by the Model blocks.



Visualizing Model Reference Architectures

This system models the thermodynamics of a house

sldemo_mdlref_depgraph

Parameter Attributes

ModelVersion	1.76
LastModifiedDate	Tue Oct 01 03:12:44 2013
LibraryLinkDisplay	none
ModelBrowserVisibility	off
Dirty	off
Description	

Click a Model block to see its properties. Double-click a Model block to display the referenced model.

- “Create and Use a Web View” on page 5-13

Input Arguments

`system_name` — The system to export to a Web view file

string containing the path to the system | handle to a subsystem or block diagram | handle to a chart or subchart

Exports the specified system or subsystem and its child systems to a Web view file. By default, child systems of the `system_name` system are also exported. Use the `SearchScope` name-value pair to export other systems, in relation to `system_name`.

Name-Value Pair Arguments

Specify optional comma-separated pairs of `Name,Value` arguments. `Name` is the argument name and `Value` is the corresponding value. `Name` must appear inside single quotes (' '). You can specify several name and value pair arguments in any order as `Name1,Value1,...,NameN,ValueN`.

Example: `htmlFileName = slwebview(gcs,'LookUnderMasks','all',... 'FollowLinks','on')` Export to a Web view all layers of the model hierarchy to which the current system belongs, including the ability to interact with library links and masks.

`'SearchScope'` — Systems to export, relative to the `system_name` system
`'CurrentAndBelow'` (default) | `'Current'` | `'CurrentAndAbove'` | `'All'`

`'CurrentAndBelow'` exports the Simulink system or the Stateflow chart specified by `system_name` and all systems or charts that it contains.

`'Current'` exports only the Simulink system or the Stateflow chart specified by `system_name`.

`'CurrentAndAbove'` exports the Simulink system or the Stateflow chart specified by the `system_name` and all systems or charts that contain it.

`'All'` exports all Simulink systems or Stateflow charts in the model that contains the system or chart specified by `system_name`.

Data Types: `char`

`'LookUnderMasks'` — Specifies whether to export the ability to interact with masked blocks
`'none'` (default) | `'all'`

`'none'` does not export masked blocks in the Web view. Masked blocks are included in the exported systems, but you cannot access the contents of the masked blocks.

`'all'` exports all masked blocks.

Data Types: `char`

`'FollowLinks'` — Specifies whether to follow links into library blocks
`'off'` (default) | `'on'`

`'off'` does not allow you to follow links into library blocks in a Web view.

`'on'` allows you to follow links into library blocks in a Web view.

Data Types: `char`

`'FollowModelReference'` — Specifies whether to access referenced models in a Web view
`'off'` (default) | `'on'`

`'off'` does not allow you to access referenced models in a Web view.

`'on'` allows you to access referenced models in a Web view.

Data Types: `char`

`'ViewFile'` — Specifies whether to display the Web view in a Web browser when you export the Web view
`true` (default) | `false`

`true` displays the Web view in a Web browser when you export the Web view.

`false` does not display the Web view in a Web browser when you export the Web view.

Data Types: `logical`

`'ShowProgressBar'` — Specifies whether to display the status bar when you export a Web view
`true` (default) | `false`

`true` displays the status bar when you export a Web view.

`false` does not display the status bar when you export a Web view.

Data Types: `logical`

Output Arguments

`filename` — The name of the HTML file for displaying the Web view
string

Reports the name of the HTML file for displaying the Web view. Exporting a Web view creates the supporting files, in a folder.

More About

Tips

A Web view is an interactive rendition of a model that you can view in a Web browser. You can navigate a Web view hierarchically to examine specific subsystems and to see properties of blocks and signals.

You can use Web views to share models with people who do not have Simulink installed.

Web views require a Web browser that supports Scalable Vector Graphics (SVG).

Introduced in R2006a

Template-Based Report Formatting

Report Conversion Templates

In this section...
"Templates for Report Conversion" on page 10-2
"Customizing Templates" on page 10-2

Templates for Report Conversion

If you select a `from template` file format for output, the Report Generator uses an appropriate template to convert the XML content to the final format. For example, it uses a Microsoft Word template to format reports you generate in Word. The template determines the layout and format of the resulting document.

The **File format** option you select determines the template used to generate the report.

- `Direct PDF (from template)`. This format uses an HTML-based template that includes page layout elements that describe page size, headers, footers, and so on. Report generation using this option is faster than using `PDF (from Word template)`, especially for large documents that take a long time to open in Word.
- `PDF (from Word template)` . This format uses a Word template to convert the XML first to Word and then to PDF. Select this option if you want to use the formatting capabilities of Word as the basis of your PDF.
- `HTML (from template)`. This format uses an HTML template for the conversion.
- `Word (from template)`. This format uses a Microsoft Word template for the conversion.

Customizing Templates

The MATLAB Report Generator comes with default templates for each supported format. You can create customized versions of these templates to meet your report formatting and layout needs. After you create a custom template, you can select it from the template list next to the **File format** list when you set your report output options.

When you select a custom template to generate a report, you can apply styles in that template to instances of report components. For example, suppose your template defines three different styles of paragraph formatting. You can apply any of these styles to any Paragraph component instance in your report setup file. You can apply styles this way to any instance of a component that has a **Style Name** property.

Related Examples

- “Generate a Report Using a Template” on page 10-4
- “Copy a Conversion Template” on page 10-12
- “Customize Microsoft Word Report Styles” on page 10-17
- “Customize Microsoft Word Part Templates” on page 10-20
- “Customize a Microsoft Word Title Page Template” on page 10-30
- “Create a Custom HTML or PDF Template” on page 10-36

More About

- “Conversion Template Contents” on page 10-5

Generate a Report Using a Template

1 In Report Explorer, in the **Outline** pane, select the report.

2 In the Report Options dialog box that appears in the **Properties** pane, set the **File format** field to one of these options:

- `Direct PDF (from template)`
- `HTML (from template)`
- `PDF (from Word template)`
- `Word (from template)`

3 Optionally, from the list of templates available for the current file format, select a template.

4 If you select `HTML (from template)` for the file format, choose a packaging option for the output files.

- **Unzipped** — Generate the report files in a subfolder of the current folder. The subfolder has the report name.
- **Zipped** — Package report files in a single compressed file that has the report name, with a `.zip` extension.
- **Both Zipped and Unzipped**

5 In the toolbar, click the **Report** button ⚡.

More About

- “Report Conversion Templates” on page 10-2

Conversion Template Contents

In this section...
"Default Styles" on page 10-5
"Part Templates" on page 10-9
"Header and Footers in Word Conversion Templates" on page 10-10

A report conversion template contains:

- A main template with default style definitions for report elements.
- Part templates for the report elements such as title pages, chapters, and titles for sections and tables. Part templates contain fill-in-the-blanks holes for generated content.
- Headers and footers.

Default Styles

The default conversion template includes styles that the Report Explorer uses to format components during report generation. Most styles begin with `rg` (for example, `rgTitle`). Styles for syntax highlighting MATLAB code begin with `MWSG`, for example, `MWSHKeywords`. The default style names and formatting are the same for the Word and HTML templates, to the extent applicable. For example, page break formatting applies when you use a Word template, but not an HTML template.

You can modify the built-in styles, but do not delete them. In addition, you can define your own styles and use them in components that allow you to specify a style, such as the `Paragraph` component.

Style	Report Explorer Components the Style Formats
`MWSHComment`	MATLAB code comment
`MWSHKeywords`	MATLAB code keywords
`MWSHStrings`	MATLAB code strings
`rgAbstract`	`Title Page` component abstract
`rgAbstractTitle`	`Title Page` component abstract section
`rgAuthor`	`Title Page` component front page author
`rgAuthorVerso`	`Title Page` component back page author

Style	Report Explorer Components the Style Formats
`rgBody`	`Text` component
`rgChapter`	`Chapter` component
`rgChapterTitle`	`Chapter` component title
`rgCopyright`	`Title Page` component copyright
`rgFigure`	`Paragraph` that contains an image generated by a snapshot or `Image` component, to adjust the spacing of images relative to adjacent paragraphs
`rgFigureCaption`	The caption for `Image` component and snapshot components
`rgFigureTitle`	The `Image` component and snapshot components title
`rgFigureTitleNumber`	The `Image` component and snapshot components title number
`rgFigureTitlePrefix`	The `Image` component and snapshot components title prefix
`rgFigureTitleText`	The `Image` component and snapshot components title text
`rgLegalNotice`	`Title Page` component legal notice section
`rgListStyle`	Specifies the style of lists generated by the `List` component.
`rgListTitle`	The `List` component title
`rgListTitleNumber`	The `List` component title number
`rgListTitlePrefix`	The `List` component title prefix
`rgListTitleText`	The `List` component title text
`rgParagraph`	`Paragraph` component text
`rgParagraphTitle`	`Paragraph` component title

Style	Report Explorer Components the Style Formats
`rgProgramListing`	Code generated by: • `Text` component with **Show text as syntax highlighted MATLAB code** option is selected • `MATLAB Function Block` component • `Truth Table` component
`rgPubDate`	`Title page` report creation date
`rgPubDatePrefix`	`Title page` report creation date prefix
`rgSect1Title`	`Section` title for first-level section in a chapter
`rgSect1TitleNumber`	Number for `Section` title for first-level section in a chapter
`rgSect1TitlePrefix`	Prefix for `Section` title for first-level section in a chapter
`rgSect1TitleText`	Text for `Section` title for first-level section in a chapter
`rgSect2Title`	`Section` title for second-level section in a chapter
`rgSect2TitleNumber`	Number for `Section` title for second-level section in a chapter
`rgSect2TitlePrefix`	Prefix for `Section` title for second-level section in a chapter
`rgSect2TitleText`	Text for `Section` title for second-level section in a chapter
`rgSect3Title`	`Section` title for third-level section in a chapter
`rgSect3TitleNumber`	Number for `Section` title for third-level section in a chapter
`rgSect3TitlePrefix`	Prefix for `Section` title for third-level section in a chapter

Style	Report Explorer Components the Style Formats
`rgSect3TitleText`	Text for `Section` title for third-level section in a chapter
`rgSect4Title`	`Section` title for fourth-level section in a chapter
`rgSect4TitleNumber`	Number for `Section` title for fourth-level section in a chapter
`rgSect4TitlePrefix`	Prefix for `Section` title for fourth-level section in a chapter
`rgSect4TitleText`	Text for `Section` title for fourth-level section in a chapter
`rgSect5Title`	`Section` title for fifth-level section in a chapter
`rgSect5TitleNumber`	Number for `Section` title for fifth-level section in a chapter
`rgSect5TitlePrefix`	Prefix for `Section` title for fifth-level section in a chapter
`rgSect5TitleText`	Text for `Section` title for fifth-level section in a chapter
`rgSubTitle`	`Title Page` component subtitle
`rgTable`	`Table` content
`rgTableTitle`	`Table` title
`rgTableTitleNumber`	`Table` title number
`rgTableTitlePrefix`	`Table` title prefix
`rgTableTitleText`	`Table` title text
`rgTitle`	`Title Page` component front page title abstract, and legal notice section
`rgTitleVerso`	`Title Page` component back page title abstract, and legal notice section
`rgTOCSection`	Table of contents

Part Templates

The conversion templates include template parts to format specific elements of a report.

Part Template	Report Explorer Components the Part Template Formats
`rgRectoTitlePage`	`Title Page` Front title page contents, including the report title, subtitle, author, and an image.
`rgVersoTitlePage`	`Title Page` Back title page contents, including the date published, copyright, legal notice, and abstract.
`rgTOCSectionTitle`	The table of contents automatically generated for Word and PDF.
`rgChapter`	`Chapter/Section` Chapter (top-level section), including the title (prefix, such as `Chapter`, number, and title) and for the content.

`rgSect1Title`
 	
`rgSect2Title`
 	
`rgSect3Title`
 	
`rgSect4Title`
 	
`rgSect5Title`
	`Chapter/Section`
	
	Title for a section (sections below the chapter level). The title can include a prefix (such as `Chapter`), number, and title.

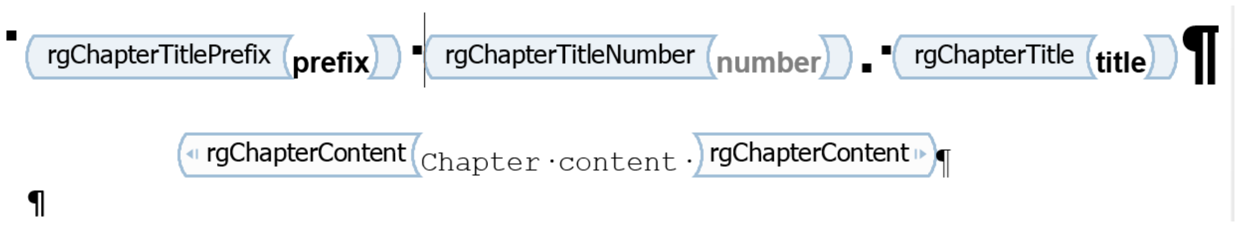
`rgListTitle`	`List` Title of the list.
`rgTableTitle`	`Table`, `Array-BasedTable`, and table components such as `Handle Graphics Property Table`

Part Template	Report Explorer Components the Part Template Formats
	Table title, including prefix (such as `Table`, number, and title) and for the content.
`rgFigureTitle`	`Table` and `Array-BasedTable` Table title, including prefix (such as `Table`, number, and title) and for the content.

Part Template Holes

Part templates include fill-in-the-blanks hole markup. The report converter fills holes with content that the MATLAB Report Generator generates.

For example, the `rgChapter` part template in the default Word conversion template includes an `rgChapterTitle` hole.



The report converter fills the `rgChapterTitle` hole with the contents of the `Title` property of top-level `Chapter/Section` components in a report.

You can rearrange or delete holes to change the order in which generated content appears in the report or to omit content. Do not add holes. If you add holes, the report converter ignores them.

Header and Footers in Word Conversion Templates

Word conversion templates include headers and footers for the document as a whole.

You can also specify headers and footers for the `rgRectoTitlePage`, `rgVersoTitlePage`, and `rgChapter` part templates.

Related Examples

- “Generate a Report Using a Template” on page 10-4
- “Copy a Conversion Template” on page 10-12
- “Customize Microsoft Word Report Styles” on page 10-17
- “Customize Microsoft Word Part Templates” on page 10-20
- “Customize a Microsoft Word Title Page Template” on page 10-30

More About

- “Report Conversion Templates” on page 10-2

Copy a Conversion Template

A template you create by copying a template appears in the list of templates. The initial name of the copy in the list of templates is `Copy of ORIGINAL`, where `ORIGINAL` is the name of the template that you copied. The name in the list is not the file name you used when you saved the copy.

To change the template name that appears in the list of templates, in the Template Properties dialog box, specify the name in the **Display name** field. For details, see “Set Conversion Template Properties” on page 10-14.

Copy a Conversion Template

1. In Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2. In the **Library** pane, select a template from the list. For example, select `Default Word Template`.
3. Click **Copy template**.
4. Navigate to where you want to save the template file. Select a folder that is on the MATLAB path (for example, in the `MATLAB` folder in your home folder).
5. Give the template a name and click **Save**.

Related Examples

- “Set Conversion Template Properties” on page 10-14
- “Open a Conversion Template” on page 10-13
- “Move a Conversion Template” on page 10-15
- “Delete a Conversion Template” on page 10-16
- “Customize Microsoft Word Report Styles” on page 10-17
- “Customize Microsoft Word Part Templates” on page 10-20
- “Customize a Microsoft Word Title Page Template” on page 10-30

More About

- “Report Conversion Templates” on page 10-2

Open a Conversion Template

You can open a copy of a conversion template to edit it. Opening a Word template opens the template in Microsoft Word. Opening an HTML or PDF template unzips the template and opens the main template document and the document part template library in the HTML editor specified by your Report Generator preferences (the MATLAB editor by default). To learn more about contents of templates, see “Conversion Template Contents” on page 10-5.

Tip The Report Generator repackages an open HTML or PDF template before running a report based on the template. Run a report after editing an HTML or PDF template to ensure that your changes are saved.

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1. In Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2. Select a template from the list of templates in the **Library** pane. For example, select `Default Word Template`. The properties of the template appear in the Report Explorer **Properties** pane.
3. Click **Copy template** and follow the prompts to create a copy of the default template. If you already have a copy of a default template, you can skip this step.
4. Select the template copy and click **Open template**.

To also open the template style sheet, click **Open style sheet**.

Related Examples

- “Copy a Conversion Template” on page 10-12
- “Set Conversion Template Properties” on page 10-14

More About

- “Report Conversion Templates” on page 10-2

Set Conversion Template Properties

For copies of conversion templates, you can specify properties to describe the template. To learn more about using this dialog box, see “Copy a Conversion Template” on page 10-12 and “Open a Conversion Template” on page 10-13.

1. In Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2. From the list of templates in the **Library** pane, click the template whose properties you want to set.
3. In the **Properties** pane, specify properties for the template.
   - **Template id** — Description of the template, such as `Word template for model reports`.
   - **Display name** — Template name to display in the list of templates (for example, `Model reports`).
   - **Description** — Description of the template.
   - **Creator** — Name of the person or organization that created the template.
4. Apply the properties by selecting another template in the list of templates.

Related Examples

- “Copy a Conversion Template” on page 10-12
- “Open a Conversion Template” on page 10-13
- “Move a Conversion Template” on page 10-15

More About

- “Report Conversion Templates” on page 10-2

Move a Conversion Template

You can change the location of a template file.

1. In Report Explorer, select **Tools** > **Edit Document Conversion Template**. The Template Browser appears in the Report Explorer.
2. In the Report Explorer, select the template to move.
3. In the Template Browser, select **Move template**.
4. In the file browser, navigate to the new location for the template file. Enter a file name, using the appropriate extension for the type of template (`.dotx` or `.htmtx`).
5. Click **Save**. The **Path** property in the Template Browser shows the new location.

Related Examples

- "Copy a Conversion Template" on page 10-12
- "Open a Conversion Template" on page 10-13
- "Delete a Conversion Template" on page 10-16

More About

- "Report Conversion Templates" on page 10-2

Delete a Conversion Template

1. In Report Explorer, select **Tools** > **Edit Document Conversion Template**. The Template Browser appears in the Report Explorer.
2. In the Report Explorer, select the template to delete.
3. In the Template Browser, select **Delete template** and click **Yes**.

Related Examples

- "Copy a Conversion Template" on page 10-12
- "Open a Conversion Template" on page 10-13
- "Move a Conversion Template" on page 10-15

More About

- "Report Conversion Templates" on page 10-2

Customize Microsoft Word Report Styles

In this section...
"Customize Default Microsoft Word Component Styles" on page 10-17
"Create Styles in a Microsoft Word Template" on page 10-17

You can customize report styles in a custom Word conversion template or add styles to a custom Word template.

For more information about Word styles, see the Microsoft Word documentation.

Customize Default Microsoft Word Component Styles

Note: If you do not have a custom Word conversion template, see "Copy a Conversion Template" on page 10-12.

1 In the Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2 In the list of templates in the middle pane, select the custom template that contains the style you want to customize.
3 In the **Properties** pane, click **Open stylesheet**. The Word Manage Styles dialog box appears.
4 Use the Manage Styles dialog box to modify or create styles.

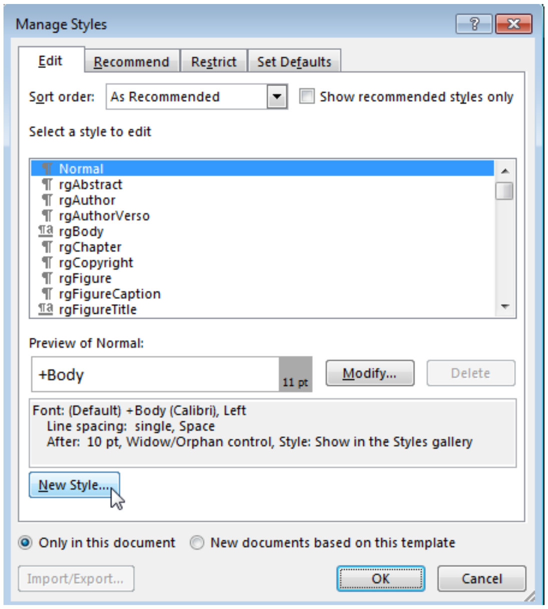
   Styles that begin with `rg` (for example, `rgParagraph`) are the default styles used for report components. A default style applies to all instances of a component with which it is associated. (In the Report Explorer, some components allow you to replace the name of a default style with the name a style that you create. This allows you to specify different styles for different instances of the same component.)

   For details, see "Create Styles in a Microsoft Word Template" on page 10-17.

Create Styles in a Microsoft Word Template

Note: If you do not have a custom Word conversion template, see "Copy a Conversion Template" on page 10-12.

1 In the Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2 In the list of templates in the middle pane, select a custom template.
3 In the **Properties** pane, click **Open stylesheet**.
4 If applicable, select an existing style to use as a starting point for the new style.
5 Click the **New Style** button.



Font: (Default) +Body (Calibri), Left
Line spacing: single, Space
After: 10 pt, Widow/Orphan control, Style: Show in the Styles gallery

6 Specify a name for the new style and define the style characteristics. To save the new style definition, click **OK** and close the dialog box.
7 In the Manage Styles dialog box, click **OK**.
8 In Word, save and close the template.

Related Examples

- "Customize Microsoft Word Part Templates" on page 10-20
- "Customize a Microsoft Word Title Page Template" on page 10-30

More About

- "Report Conversion Templates" on page 10-2

- “Conversion Template Contents” on page 10-5

Customize Microsoft Word Part Templates

In this section...

Custom Word Part Templates

You can create custom Word part templates (such as a title page part template) to:

- Tailor report formatting to meet your specific formatting requirements.
- Delete a hole. For a description of holes, see "Part Template Holes" on page 10-10.
- Rearrange the order of holes.
- Add fixed content to a footer or header.

If you delete a hole in a part template, then the generated report does not include the component data associated with that hole. For example, the `rgRectoTitlePage` part template includes an `rgAuthor` hole. If you delete the `rgAuthor` hole, then reports generated with the template do not include the author, even if the report has a `Title Page` component that specifies a value for the `Author` property.

The only kind of holes that you can add to a part template are the holes that the Report Explorer supports for that part template. For example, for the `rgChapter` part template, you can only reinsert `rgChapterTitlePrefix`, `rgChapterTitleNumber`, `rgChapterTitle`, and `rgChapterContent` holes. Do not add multiple instances of the same kind of hole in a part template.

Display the Developer Ribbon in Word

To work with holes in a Word template, use the Word **Developer** ribbon. If the **Developer** tab is not showing in your Word ribbon, add it to the ribbon.

1 In Word, select **File** > **Options**.
2 In the Word Options dialog box, select **Customize Ribbon**.
3 In the **Customize the Ribbon** list, select the **Developer** check box and click **OK**.

Tip If you do not see **Developer** check box in the list, set **Customize the Ribbon** to `Main Tabs`.

Customize a Word Conversion Part Template

To customize a report element such as a title page, replace the appropriate default part template with a customized copy of the part template. For another example illustrating how to create a custom Word part template, see "Customize a Microsoft Word Title Page Template" on page 10-30.

Note: If you do not have a custom Word conversion template, see "Copy a Conversion Template" on page 10-12.

1 In the Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2 In the list of templates in the middle pane, select a custom template.
3 In the **Properties** pane, click **Open template**.
4 At the beginning of the template, position the cursor in the first paragraph and click the **Quick Parts** button.
5 In the **Insert** tab, select the **Quick Parts** button.
6 In the Quick Parts Gallery, select the part template (for example, `rgChapter`).
7 Edit the copy of the part template. For example, remove a hole by right-clicking and selecting **Remove Content Control**.
8 In the template, select the part template, including all of its holes.
9 In the Quick Parts Gallery, select **Save Selection to Quick Part Gallery**.

10 In the Create New Building Block dialog box, set **Name** to the part template name (for example, `rgChapter`) and the **Category** to `mlreportgen`. Click **OK**.

11 In the template, delete the customized part template.

12 Save the main template.

Set Default Text Style for a Hole

Your template can specify the name of a style to use as a default to format text generated for a hole.

Note: If you do not have a custom Word conversion template, see "Copy a Conversion Template" on page 10-12.

---

1 In the Report Explorer, select **Tools** > **Edit Document Conversion Template**.

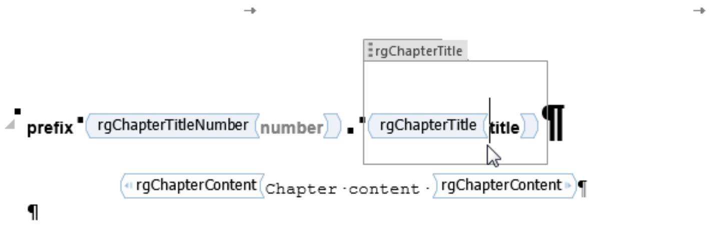
2 In the list of templates in the middle pane, select the custom template that has the hole you want to set the default text style for.

3 In the Template Browser, click **Open template**.

4 In the **Insert** tab, select the **Quick Parts** button.

5 In the Quick Parts Gallery, select the part template that contains the hole (for example, `rgChapter`).

6 Right-click in the text area of the hole whose default text style you want to specify. For example, in `rgChapter`, right-click in the `rgChapterTitle` hole.



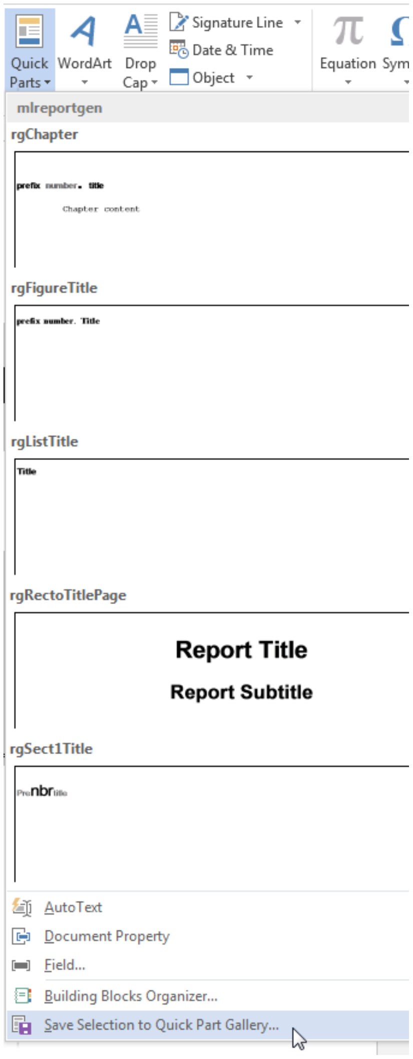
7 Select **Properties**.

8 In the Content Control Properties dialog box, select the **Use a style to format text typed into the empty control** check box.

9 From the **Style** list, select a style to use an existing style or select **New Style** to create a new style to use as the default style and click **OK**.

10 Select the part template and click the **Quick Parts** button.

11 Click **Save Selection to Quick Part Gallery**.



12 In the Create New Building Block dialog box, set **Name** to the part template name (for example, `rgChapter`) and the **Category** to `mlreportgen`. Click **OK**.

13 Save and close the template.

Distinguish Inline and Block Holes

The Report Explorer supports two types of holes: inline and block.

- Use an inline hole is for content that you can include in a Word paragraph.
- Use a block hole for content that you cannot embed in a paragraph.

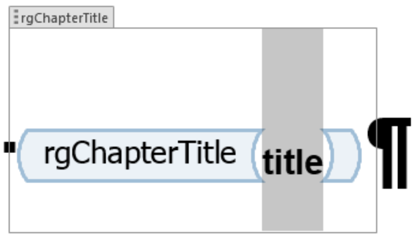
You can configure the Word editor to provide visual cues that indicate whether a hole is an inline or block hole.

Note: If you do not have a custom Word conversion template, see “Copy a Conversion Template” on page 10-12.

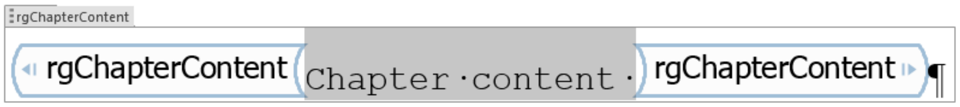
---

1. Open the custom Word template.
2. On the Word ribbon, select the **Home** tab.
3. Click the **Show/Hide** ¶ button to display Word paragraph markers.
4. On the Word ribbon, select the **Developer** tab.
5. Click **Design Mode** to Word markup for holes.
6. Click a hole to determine whether it is an inline or block hole.

   - Inline hole — The bounding box does not include the paragraph marker.



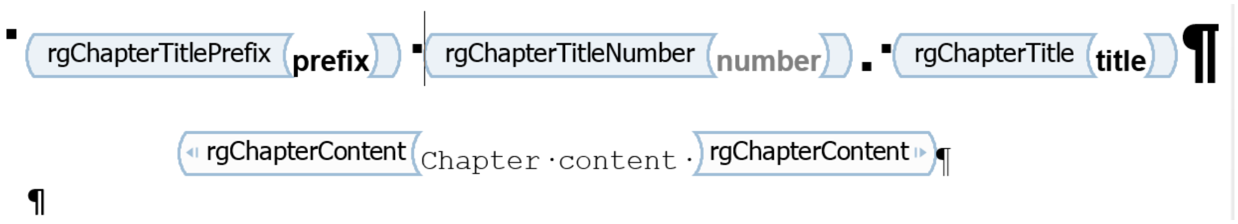
   - Block hole — The bounding box does includes the paragraph marker.



Avoid Changing Block Holes to Inline Holes

Do not change a block hole to an inline hole.

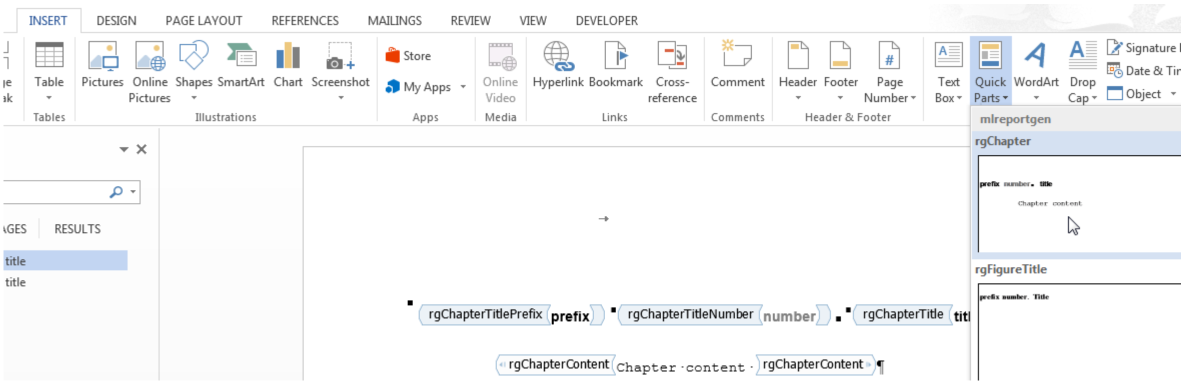
You can accidentally change a block hole to an inline hole by removing the paragraph marker of an inline hole that is followed by a block hole. For example, if you delete the paragraph marker for the `rgChapterTitle` inline hole, the `rgChapterContent` block hole changes to an inline hole.



Delete a Hole

Note: If you do not have a custom Word conversion template, see “Copy a Conversion Template” on page 10-12.

1. In the Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2. In the list of Word templates in the middle pane, select the custom template that you want to edit.
3. In the Template Browser, click **Open template**.
4. To display Word paragraph markers (if they are not already visible), on the Word ribbon in the **Home** tab, click the **Show/Hide** ¶ button.
5. In the Word ribbon, in the **Insert** tab, click the **Quick Parts** button.
6. Select the part template to customize. For example, select `rgChapter` to customize the part template for a chapter.



Tip To display Word markup for the part template, on the Word ribbon, in the **Developer** tab, click **Design Mode**.

7 Write down the name of the part template you are customizing, because you need to enter that name later in this procedure.

8 In the `rgChapter` part template, delete the `rgChapterTitlePrefix` hole. Select the hole markup and click the **Delete** key.

9 In the template, select all of the contents of the part template.

10 Right-click and select **Properties**.

11 In the Content Control Properties dialog box, in the **Title** and **Tag** fields, enter the name of the template part you are customizing `rgChapter`. Click **OK**.

12 In the template, select all of the contents of the part template. In the **Insert** tab, click the **Quick Parts** button.

13 Click **Save Selection to Quick Part Gallery**.

14 In the Create New Building Block dialog box, set **Name** to the part template name (for example, `rgChapter`) and the **Category** to `mlreportgen`. Click **OK**.

15 In the template, select all of the contents of the part template and click the **Delete** button.

16 Save and close the template.

Add an Inline Hole

The only kind of holes that you can add to a part template are the holes that the Report Explorer supports for that part template. For example, for the `rgChapter` part template, the only inline holes that you can reinsert are `rgChapterTitlePrefix`, `rgChapterTitleNumber`, and `rgChapterTitle` holes. Do not add multiple instances of the same kind of hole in a part template.

Note: If you do not have a custom Word conversion template, see "Copy a Conversion Template" on page 10-12.

---

1 In the Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2 In the list of Word templates in the middle pane, select the custom template that you want to edit.
3 In the Template Browser, click **Open template**.
4 To display Word paragraph markers, click the **Show/Hide** ¶ button.
5 Position the Word insertion mark at the point in a paragraph where you want to add an inline hole.

Tip If the hole is the only content in a paragraph or is at the end of a paragraph, add several blank spaces and insert the hole before the spaces.

---

6 Click the **Rich Text Control** button Aa. Word inserts a rich text control at the insertion point.
7 To see hole markup, on the Word ribbon, in the **Developer** tab click **Design Mode**.
8 Right-click in the hole and select **Properties**.
9 In the dialog box, in the **Title** and **Tag** fields, enter the name of the hole. Use a Report Explorer hole name. For example, if you insert an `rgChapterTitlePrefix` hole, set the **Title** and **Tag** fields to `rgChapterTitlePrefix`.
10 In the template, select all of the contents of the part template. In the **Insert** tab, click the **Quick Parts** button.
11 Click **Save Selection to Quick Part Gallery**.
12 In the Create New Building Block dialog box, set **Name** to the part template name (for example, `rgChapter`) and the **Category** to `mlreportgen`. Click **OK**.

13 In the template, select all of the contents of the part template and click the **Delete** button.

14 Save and close the template.

Add a Block Hole

The only kind of holes that you can add to a part template are the holes that the Report Explorer supports for that part template. For example, for the `rgChapter` part template, the block hole that you can reinsert is `rgChapterContent` holes. Do not add multiple instances of the same kind of hole in a part template.

Creating a block-level hole in a Word document is essentially the same as creating an inline hole. The main difference is that rich text content control must contain an (empty) paragraph instead of residing in a paragraph. Create an empty paragraph at the point where you want to create a block-level hole. If you are at the end of a document, create a second empty paragraph.

Remove or Modify Chapter Prefix

Reports that use the default templates include the word `Chapter` as a prefix in the chapter title. If you do not want to use the prefix, you can delete from your template before you create a report. If you want to use a word other than `Chapter`, for example, for localization, you can replace the prefix.

1 If you have not done so, create a custom Word template. See “Create a Custom Template” on page 10-30.

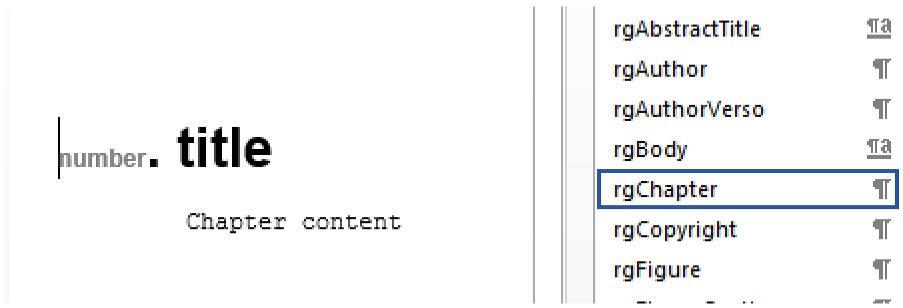
2 Open the template.

3 On the Word **Insert** ribbon, in the **Text** area, click the **Explore Quick Parts** button.

4 To insert an instance of the part you want to modify in your template, select the **rgChapter** quick part.

5 Edit the instance. You can remove the prefix hole, or you can replace it with fixed text.

   Make sure that the style applied to this line is still **rgChapter**.



6 Select the edited instance. Then, on the **Insert** ribbon, click the **Explore Quick Parts** button and select **Save Selection to Quick Parts Gallery**.

7 In the dialog box, set **Name** to `rgChapter` and **Category** to `mlreportgen`, and then click **OK**. Confirm that you want to overwrite the previous version.

8 Save and close the template.

Related Examples

- "Copy a Conversion Template" on page 10-12
- "Customize Microsoft Word Report Styles" on page 10-17
- "Customize a Microsoft Word Title Page Template" on page 10-30

More About

- "Report Conversion Templates" on page 10-2
- "Conversion Template Contents" on page 10-5

Customize a Microsoft Word Title Page Template

In this section...

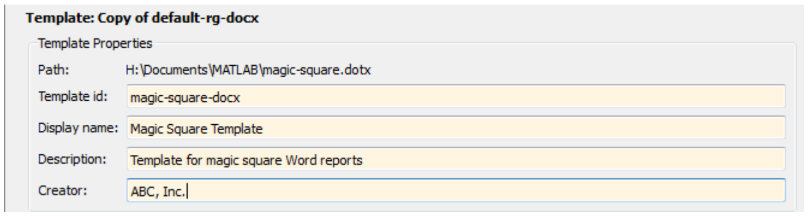
The Report Explorer default Word document conversion template contains document part templates for the front (recto) and back (verso) side of a report title page. The Report Explorer file converter for the `Word (from template)` output type uses the title page part templates to produce the title pages in the Word output.

This example shows how to create a custom template that changes the color of the title and how to customize the layout of a title page. The example uses a custom template with the Report Generator magic square report example.

Create a Custom Template

Note: To complete the rest of this example, you need a custom Word conversion template. If you have a custom template that you want to use for this example, you can skip to "Change the Color of a Report Title" on page 10-31.

1. In the Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2. In the list of templates, select the `Default Word Template`.
3. In the Template Browser, click **Copy template**.
4. In the file browser, navigate to the folder on the MATLAB path that you want to use for the custom template. For the file name, enter `magic-square` and click **Save**.
5. In the list of templates, select `Copy of Default Word Template`.
6. At the top of the Template Properties dialog box, use these settings:



Template: Copy of default-rg-docx

Template Properties

Path:	H:\Documents\MATLAB\magic-square.dotx
Template id:	magic-square-docx
Display name:	Magic Square Template
Description:	Template for magic square Word reports
Creator:	ABC, Inc.

7 Apply the properties by selecting another template in the list of templates.

Change the Color of a Report Title

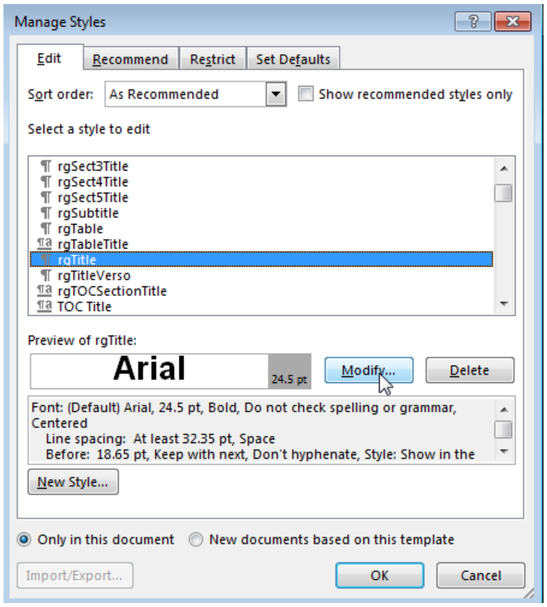
You can customize the `Magic Square Template` (see “Create a Custom Template” on page 10-30) to use blue text for the report title.

1 In the Report Explorer, select **Tools** > **Edit Document Conversion Template**.

2 In the Report Explorer list of Word templates, select `Magic Square Template`.

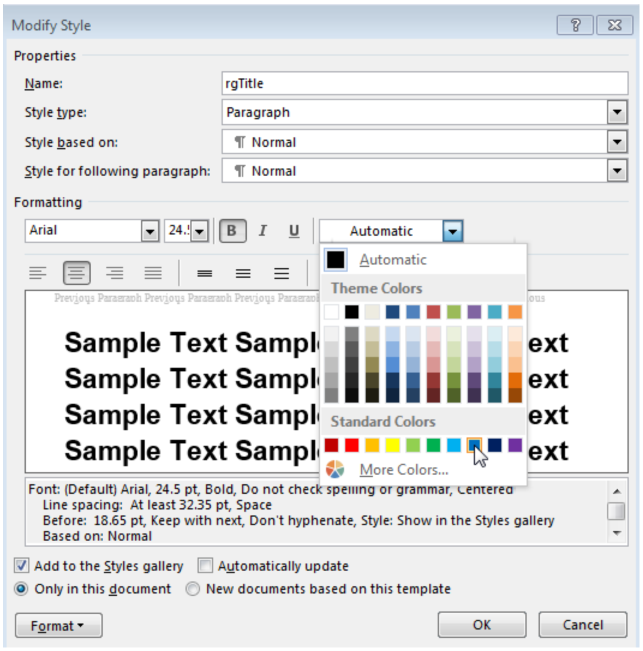
3 In the Template Browser, click **Open style sheet**. In Word, the template opens, with the Manage Styles dialog box displayed.

4 In the Manage Styles dialog box, select the `rgTitle` style and click **Modify**.



Font: (Default) Arial, 24.5 pt, Bold, Do not check spelling or grammar, Centered
Line spacing: At least 32.35 pt, Space
Before: 18.65 pt, Keep with next, Don't hyphenate, Style: Show in the

5 In the Modify Style dialog box for `rgTitle`, click the down arrow for `Automatic`. Select the blue color box and click **OK**.


Modify Style

Properties

Name: rgTitle

Style type: Paragraph

Style based on: ¶ Normal

Style for following paragraph: ¶ Normal

Formatting

Arial 24.5 **B** *I* U Automatic

Automatic

Theme Colors

Standard Colors

More Colors...

Font: (Default) Arial, 24.5 pt, Bold, Do not check spelling or grammar, Centered
Line spacing: At least 32.35 pt, Space
Before: 18.65 pt, Keep with next, Don't hyphenate, Style: Show in the Styles gallery
Based on: Normal

[✓] Add to the Styles gallery [ ] Automatically update

[●] Only in this document ( ) New documents based on this template

6 In the Manage Styles dialog box, click **OK**.

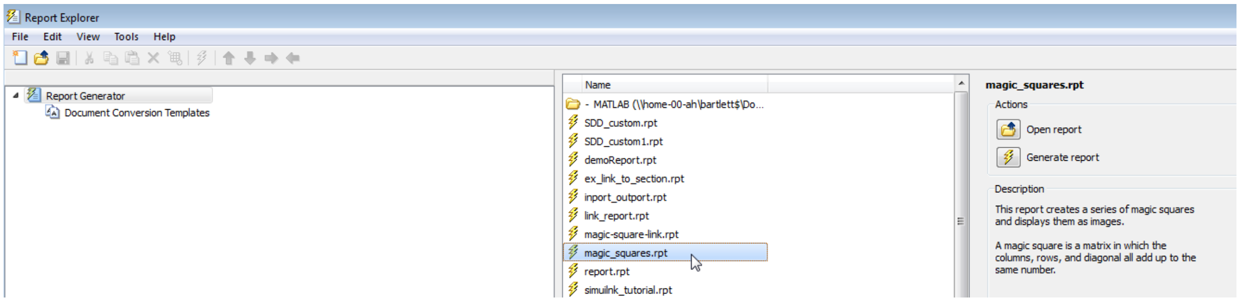
7 Save and close the template.

Assign the Template to a Report

You can assign the customized template to the `magic-square.rpt` Report Explorer report.

1 In the Report Explorer, select `Report Generator` node.

2 In the Report Explorer, in the list of reports, select `magic_square.rpt`.



- MATLAB (\\home-00-ah\bartlett$\Do...
SDD_custom.rpt
SDD_custom1.rpt
demoReport.rpt
ex_link_to_section.rpt
inport_outport.rpt
link_report.rpt
magic-square-link.rpt
magic_squares.rpt
report.rpt
simulnk_tutorial.rpt

magic_squares.rpt

This report creates a series of magic squares and displays them as images.

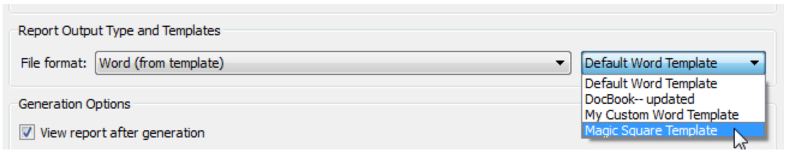
A magic square is a matrix in which the columns, rows, and diagonal all add up to the same number.

3 In the Report Options pane, click **Open report**.

4 In the `magic_squares` report, add a `Title Page` component. In the Title Page dialog box, set the **Title** field to `Magic Squares`.

5 Below the `Title Page` component, add a `Chapter` component.

6 In the Report Options dialog box, set **File format** to `Word (from template)` and instead of `Default Word Template`, select `Magic Squares Template`.



File format: Word (from template)

Default Word Template
Default Word Template
DocBook-- updated
My Custom Word Template
Magic Square Template

☑ View report after generation

7 Generate the report. Select the `magic_squares` report. In the Report Explorer toolbar, click the **Report** button.

In the generated report, the title, `Magic Squares`, appears in blue.

Customize Title Page Content and Layout

This example assumes you have created a custom Magic Square Template (see “Create a Custom Template” on page 10-30). You can use a different custom Word template.

1 In the Report Explorer, select **Tools > Edit Document Conversion Template**.

2 In the Report Explorer list of Word templates, select `Magic Square Template`. In the Report Options pane, click **Open template**.

3 With the cursor in the first (and only visible) paragraph in the template, in the **Insert** tab, select the **Quick Parts** button.

4 In the Quick Parts gallery, select `rgRectoTitlePage` to insert of the front title page part template in the main document conversion template.

Tip To display Word markup for the part template, on the Word ribbon, in the **Developer** tab, click **Design Mode**.

---

5 Highlight the `rgImage` hole and drag it above the `rgTitle` hole.
6 Delete the `rgAuthor` hole.
7 Select the `rgRectoTitlePage` part template and click the **Quick Parts** button.
8 Click **Save Selection to Quick Part Gallery**.
9 In the Create New Building Block dialog box, set **Name** to `rgRectoTitlePage` and the **Category** to `mlreportgen`. Click **OK**.
10 In the template, select the contents of the part template (including the section break) and click the **Delete** button.
11 Save and close the template.

Suppose that you use the custom template to generate a report that has a `Title Page` component that specifies an image and an author. The generated report displays the image at the top of the title page and does not include an author.

Related Examples

- "Copy a Conversion Template" on page 10-12
- "Customize Microsoft Word Report Styles" on page 10-17

More About

- "Report Conversion Templates" on page 10-2
- "Conversion Template Contents" on page 10-5

Create a Custom HTML or PDF Template

In this section...

Copy the Template

To customize the format styles used in the default HTML or PDF template, copy the template and modify or add style definitions in the copy.

1. In Report Explorer, select **Tools** > **Edit Document Conversion Template**.
2. In the Library pane, select the template you want to copy. For example, select the `Default HTML Template`.
3. In the Properties pane, click **Copy template**.
4. In the file browser, navigate to where you want to save the template file.

   Select a path that is on the MATLAB path (for example, in the `MATLAB` folder in your home folder).

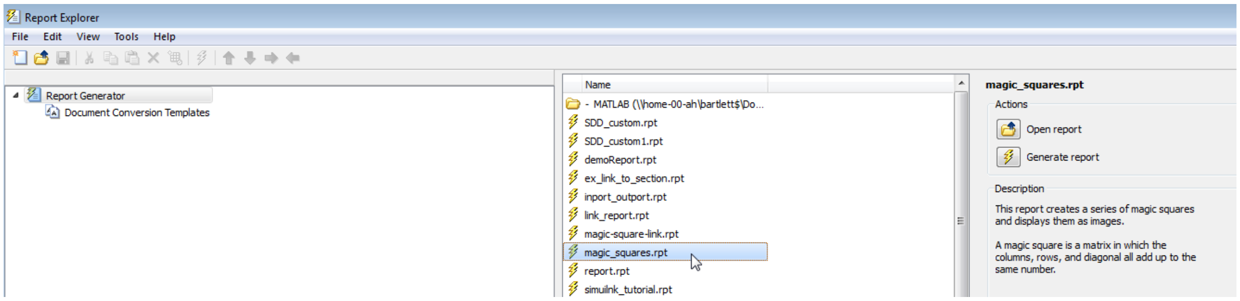
   Specify the file name, using the default file extension for an HTML template (`.htmtx`) or PDF template (`.pdftx`). Click **Save**.
5. In the list of templates in the middle pane, select the template copy.
6. In the Properties pane, in the **Template id** and **Display name** fields, specify a unique ID and display name for the template.

   The display name is the name that appears in the Report Explorer list of templates. Use the template ID to identify a template in your code.
7. To save the template properties you entered, click outside of the Properties pane.

Assign the Template to a Report

You can assign your template to a Report Explorer report.

1 In the Report Explorer, select `Report Generator` node.
2 From the list of reports, select the report you want to assign the template to.



- MATLAB (\\home-00-ah\bartlett$\Do...
SDD_custom.rpt
SDD_custom1.rpt
demoReport.rpt
ex_link_to_section.rpt
inport_outport.rpt
link_report.rpt
magic-square-link.rpt
magic_squares.rpt
report.rpt
simulnk_tutorial.rpt

magic_squares.rpt

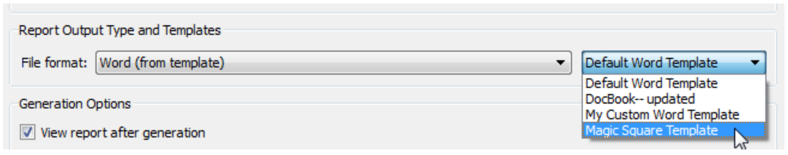
Actions

Description

This report creates a series of magic squares and displays them as images.

A magic square is a matrix in which the columns, rows, and diagonal all add up to the same number.

3 In the Report Options dialog box, set **File format** to one of the `(from template)` options. Select your template from the list.



Report Output Type and Templates

File format: Word (from template)

Default Word Template
Default Word Template
DocBook-- updated
My Custom Word Template
Magic Square Template

Generation Options

☑ View report after generation

Select an HTML Editor

By default, when you edit an HTML or PDF style sheet, the style sheet appears in the MATLAB Editor.

To use a different editor:

1 In the Report Explorer, select **File** > **Preferences**.
2 In **Edit HTML Command**, enter a MATLAB expression that opens the HTML editor you want to use. For example:

```
system('Dreamweaver %<FileName> &')
```

When you open an HTML stylesheet, the Report Explorer replaces `FileName` with the template that you selected. The ampersand (&) opens the editor in the background.

Edit HTML or PDF Templates

The templates consist of the main part (`root.html`), which defines the default page, and the document part templates (`docpart_templates.html`). You can make similar types of changes in these templates as you can in Word templates. See "Customize Microsoft Word Part Templates" on page 10-20.

The HTML and PDF templates in Report Explorer are similar, with these exceptions:

- PDF templates define a page layout, including page headers and footers. You can modify the document part templates for these layout elements. PDF templates can use a set of DOM API HTML tags supplied for this purpose. See "DOM API HTML Elements".
- PDF templates can use only a subset of standard HTML elements. See "Standard HTML Elements".

HTML and PDF templates use DOM API HTML tags to define a document part library and the document part templates within them. The `<dplibrary>` element defines the library. Your template can contain only one `<dplibrary>` tag, which is in place in the default template. The `<dptemplate>` element defines a document part. It takes an argument for the name. For example:

```
<dptemplate name="rgChapter">
```

Look in the `docpart_templates.html` file in your template for some examples.

Edit HTML or PDF Styles in a Template

You can customize or add format styles in your HTML or PDF template. You edit the styles using cascading style sheets (CSS).

For HTML templates, you can use any CSS property or selector. For PDF, you can use a subset. See "PDF Stylesheets". You can also use XSL formatting objects (FO) to format elements in a PDF template. However, to simplify and streamline your code, use FO only for properties you cannot define using CSS.

1 From the list of templates in the middle pane, select the template that you want to edit.

Tip If the Report Explorer middle pane does not show a list of templates, then select **Tools > Edit Document Conversion Template**.

2. In the Properties pane, click **Open style sheet**.
3. In the HTML editor, edit the CSS.

   For information about editing a cascading style sheet, see documentation such as the W3Schools.com CSS tutorial.
4. Save the style sheet.

Related Examples

- "Generate a Report Using a Template" on page 10-4
- "Customize Microsoft Word Report Styles" on page 10-17
- "Customize Microsoft Word Part Templates"

More About

- "Report Conversion Templates"

External Websites

- FO Summary

Create a Report Program

Create a Report Program

The MATLAB Report Generator includes a set of functions, called the document object model (DOM) API, that allows you to generate Word, HTML, and PDF reports programmatically. For example, this MATLAB code uses the API to generate and display an HTML report that shows today's date.

```
import mlreportgen.dom.*;
report = Document('today');
append(report, ['Today is ', date, '.']);
close(report);
rptview(report.OutputPath);
```

To get started learning about creating reports with the DOM API, see "Document Object Model" on page 11-4.

More About

- "Document Object Model" on page 11-4

Document Object Model

The DOM API creates a representation of a report document in your system’s memory. Such a representation is often referred to as a document object model (DOM).

The DOM API’s document object model consists of a hierarchical set of data structures, known as objects, that represent the document and its contents. At the top of the hierarchy is an object representing the document. The document object maintains a list of objects, called its children, that represent its contents (such as paragraphs, images, tables, and lists). Each child object, in turn, maintains a list of its contents. For example, a table lists its rows, a row lists its table entries, and a table entry lists its contents.

The DOM API has functions that allow you to create and assemble objects, such as paragraphs, images, and tables, into a model of a specific document. You can then use the API to write the model out to disk as an HTML, Microsoft Word, or PDF file.

DOM Object Help and Documentation

For a list of the DOM objects, enter this command at the MATLAB prompt.

```
help mlreportgen.dom
```

To get help for a specific object or method, use a `help` command.

```
help mlreportgen.dom.Paragraph
```

For a complete list of DOM API classes and functions in the MATLAB Report Generator documentation, open the **Functions and Other Reference** page.

To see the documentation reference page for an object, search in documentation or in MATLAB use a `doc` command.

```
doc mlreportgen.dom.Paragraph
```

Related Examples

- “Construct a DOM Object” on page 11-5
- “Use Dot Notation for DOM Object Properties” on page 11-7
- “Import the DOM API Package” on page 11-6

Construct a DOM Object

The DOM API includes a set of MATLAB functions, called constructors, for creating DOM objects of various types, or classes.

The name of an object constructor is the name of the MATLAB class from which the DOM creates an object. For example, the name of the constructor for a DOM paragraph object is `mlreportgen.dom.Paragraph`. Some constructors do not require any arguments. Other constructors can take one or more arguments that typically specify its initial content and properties. For example, this code creates a paragraph whose initial content is `Chapter 1`.

```
p = mlreportgen.dom.Paragraph('Chapter 1.');
```

A constructor returns a handle to the object it creates. Assigning the handle to a variable allows you to append content to the object or set its properties. For example, this code appends content to the paragraph object `p`.

```
append(p,'In the Beginning');
```

Related Examples

- “Import the DOM API Package” on page 11-6
- “Use Dot Notation for DOM Object Properties” on page 11-7

More About

- “Document Object Model” on page 11-4

Import the DOM API Package

All DOM class names, including constructor names, include the prefix `mlreportgen.dom`. You can omit the prefix if you insert this statement at the beginning of any program or function that uses the DOM API.

```
import mlreportgen.dom.*;
```

Examples that refer to DOM API objects and functions without the `mlreportgen.dom` prefix assume that you have already imported the DOM API package.

Related Examples

- “Create a Report Program” on page 11-3

More About

- “Document Object Model” on page 11-4

Use Dot Notation for DOM Object Properties

One way to specify the property of a document object is to use dot notation. You can specify a property this way to get the current value or to set the value.

With dot notation, you append a period to the name of a variable that references the object and then add the property name. For example, a `Document` object has an `OutputPath` property that specifies the location of the report. This code assigns the document object to the variable `d`. After you generate the report, you can use the value that `d.OutputPath` returns as input to the `rptview` command.

```
import mlreportgen.dom.*;
doctype = 'pdf';
d = Document('mydoc',doctype);

p = Paragraph('Hello World');
append(d,p);

close(d);
rptview(d.OutputPath);
```

This code sets a property using dot notation. Create a `Paragraph` object and assign it to the variable `p`. Use dot notation with the variable to set the `Style` property. The `Style` property can use a cell array as its value, enabling you to set several format properties at once.

```
import mlreportgen.dom.*;
doctype = 'docx';
d = Document('mydoc',doctype);

p = Paragraph('Hello World');
p.Style = {FontSize('11pt'),FontFamily('Arial'),Underline('single')};
append(d,p);

close(d);
rptview(d.OutputPath);
```

Related Examples

- "Construct a DOM Object" on page 11-5
- "Format Properties" on page 11-22

More About

- “Document Object Model” on page 11-4

Create a Document Object to Hold Content

Every report program must create an `mlreportgen.dom.Document` object to hold report content. Use the `mlreportgen.dom.Document` constructor to create a `Document` object.

If you use the constructor without arguments, the DOM API creates an HTML document named `Untitled.htmx` in the current folder. To specify a name and location, use the path name of the report as the first argument of the constructor.

You can specify the type of report to generate by using the `type` argument. You can specify the type as `'html'`, `'docx'` (for Microsoft Word), `'pdf'` for PDF output, or `'html-file'` for single-file HTML output.

This `Document` constructor creates a document object called `myReport` for Word output.

```
d = Document('myReport','docx');
```

Using the `templatePath` argument, you can specify the path name of the template to use as a basis for formatting the report. Specify a template path if you want to base your report on a custom template that defines the appearance and structure of your report. The template type must match the document type. For example, this `Document` constructor creates a document object for Word output using the template `myWordTemplate.dotx`.

```
d = Document('myReport','docx','myWordTemplate');
```

See Also

Functions
`rptview`

Classes
mlreportgen.dom.Document

Related Examples

- “Create a Report Program” on page 11-3
- “Templates for DOM API Report Programs” on page 11-27
- “Construct a DOM Object” on page 11-5

More About

- "Form-Based Reporting" on page 11-32
- "Document Object Model" on page 11-4

Add Content to a Report

The DOM `append` method allows you to add content to documents, paragraphs, tables, and other DOM objects that serve as containers for report content. The `append` function takes two arguments. The first argument is the object to append the content to. The second is the content to append. This example appends the text `Hello World` to the document.

```
d = Document('MyReport');
append(d,'Hello World');
```

If you cannot append the second object to the first, the `append` function returns an error. For example, the `append` method in this code returns an error because you cannot append a paragraph to an image.

```
% This code returns an error
image = Image('membrane.png');
append(image,Paragraph('Hello World'));
```

The reference documentation for each class lists the types of objects that you can append to instances.

Depending on the target object type, the `append` method allows you to append strings, doubles, arrays, and other basic MATLAB data types directly. The method converts the data to a DOM object before appending it to the target object. For example, this code appends a two-dimensional array of strings to a document as a table.

```
d = Document('MyDoc');
tableArray = {'a','b';'c','d'};
append(d,tableArray);
```

You can also specify basic MATLAB data types as initial content for many constructors. This example creates a table object that has a two-dimensional array of strings as initial content.

```
d = Document('MyDoc');
tableArray = {'a','b';'c','d'};
append(d,Table(tableArray));
```

See Also

Functions
mlreportgen.dom.Paragraph.append

Related Examples

- "Construct a DOM Object" on page 11-5
- "Clone a DOM Object" on page 11-13
- "Add Content as a Group" on page 11-14
- "Stream a Report" on page 11-16

More About

- "Document Object Model" on page 11-4

Clone a DOM Object

You can append the same object once in a program. To append an object multiple times to one object or to multiple objects, use the `clone` function, which creates copies of the object.

```
import mlreportgen.dom.*;

d = Document('MyDoc');
text = Text('Hello World');
text.Color = 'magenta';
text2 = clone(text);
text2.Color = 'cyan';
append(d,text);
append(d,text2);

close(d);
rptview(d.OutputPath);
```

See Also

Functions
mlreportgen.dom.Paragraph.clone

Related Examples

- "Add Content to a Report" on page 11-11
- "Construct a DOM Object" on page 11-5

More About

- "Document Object Model" on page 11-4

Add Content as a Group

You can use a group to include the same content in different parts of a report. The DOM API clones the members of a group before appending them to another object.

This example shows the key code to include. After describing the steps involved in using a group, this example includes code for a complete report that uses a group.

1 Define the DOM objects that you want to include repeatedly in a report.

```
disclaimerHead = Heading(2,'Results May Vary');
disclaimerIntro = Paragraph('The following results assume:');
disclaimerList = UnorderedList(...
    {'Temperature between 30 and 70 degrees F',...
    'Wind less than 20 MPH','Dry road conditions'});
```

2 Define a `Group` object that includes the DOM objects for the group. For example:

```
disclaimer = Group();
append(disclaimer,disclaimerHead);
append(disclaimer,disclaimerIntro);
append(disclaimer,disclaimerList);
```

3 Append the `Group` object in the place in the report where you want to repeat the content. For example, if the document object is `doc`:

```
append(doc,disclaimer);
```

This code builds a report based on this approach.

```
import mlreportgen.dom.*;
doc = Document('groupReport','html');
disclaimerHead = Heading(2,'Results May Vary');
disclaimerIntro = Paragraph('The following results assume:');
disclaimerList = UnorderedList(...
    {'Temperature between 30 and 70 degrees F',...
    'Wind less than 20 MPH','Dry road conditions'});
disclaimer = Group();
append(disclaimer,disclaimerHead);
append(disclaimer,disclaimerIntro);
append(disclaimer,disclaimerList);
append(doc,disclaimer);
p1 = Paragraph('First set of results...');
p1.Bold = true;
p2 = Paragraph('more report content...');
```

```
p2.Bold = true;
append(doc,p1);
append(doc,p2);
append(doc,disclaimer);
close(doc);
rptview('groupReport','html');
```

See Also

Functions
mlreportgen.dom.Paragraph.append

Classes
mlreportgen.dom.Group

Related Examples

- “Add Content to a Report” on page 11-11

Stream a Report

The DOM API supports two modes of appending content to a document:

- In-memory — Creates the document entirely in memory. In-memory is the default mode.
- Streaming — Streaming mode writes objects to disk as they are appended to a document. Streaming mode allows you to create large reports on systems with modest memory.

To enable streaming mode, set the `StreamOutput` property of the `Document` object for the report to `true`.

```
d = Document('MyDoc');
d.StreamOutput = true;
```

See Also

Classes
mlreportgen.dom.Document

Related Examples

- “Add Content to a Report” on page 11-11

Report Packages

A Microsoft Word document packages all its contents, text, images, style sheets, and so on, in a single compressed `.docx` file.

For HTML documents, the DOM API defines an analogous packaging scheme, with an `htmx` compressed file extension. By default, the DOM API generates HTML reports as `.htmtx` files.

To generate an HTML report in unzipped format, or in zipped and unzipped format, set the `PackageType` property of the `Document` object for a report to `'unzipped'` or `'both'`, respectively.

You can also output HTML as a single `.html` file.

PDF outputs a single `.pdf` file.

See Also

Functions
`unzipTemplate` | `zipTemplate`

Classes
mlreportgen.dom.Document

More About

- "Document Object Model" on page 11-4

Close a Report

The last step in creating a report with the DOM API is to close the report. A report must have content to produce an output file. Closing a report writes out any content that remains in memory and closes the report file. Use the `close` function.

```
d = Document('MyDoc');
append(d,'Hello World');
close(d);
```

See Also

Functions
mlreportgen.dom.Document.close

Related Examples

- “Create a Report Program” on page 11-3

More About

- “Document Object Model” on page 11-4

Display a Report

The DOM API `rptview` function allows you to display a generated report in an appropriate viewer:

- The Microsoft Word software for Word documents
- An HTML browser for HTML reports
- A PDF viewer for PDF reports

If an HTML report is in zipped format, `rptview` unzips a copy of the report in your temporary folder and displays the report's main HTML document in your default system browser.

To simplify your code, use the document output path as the argument to `rptview`. This example shows how to write your report program so you change only the value of the `doctype` variable to change the output type.

```
import mlreportgen.dom.*;
doctype = 'pdf';
d = Document('mydoc',doctype);

p = Paragraph('Hello World');
append(d,p);

close(d);
rptview(d.OutputPath);
```

Alternatively, you can specify the `rptview` function with two arguments:

- The path of the report — If you specify the file extension, you do not need to specify the second argument for output type.
- The output type — `'html'`, `'pdf'`, or `'docx'`.

  Use `'pdf'` with a report formatted for Word to convert the Word document to PDF and open it in a PDF viewer.

See Also

Functions
`rptview`

Related Examples

- “Create a Report Program” on page 11-3

Report Formatting Approaches

You can format your report using style sheets, format objects, format properties, or any combination of these approaches.

Style Sheets in Templates

The DOM API comes with default templates for each output type for formatting your report as it generates. You can customize these templates to specify the default formatting and layout of your reports. See "Templates for DOM API Report Programs" on page 11-27.

Use style sheets in a template to describe the default formatting of document objects like paragraphs, headers, and tables. A style sheet is a collection of formatting styles. A style is a named collection of formats for a particular type of object or, in the case of HTML and PDF, for a particular type of object that appears in a particular context in your document. For example, you can define a paragraph style `MyPara` that uses one set of formats, such as font size, emphasis, and font family. You define another paragraph style named `YourPara` that uses a different set of formats. When you write your report program, you assign the style to a paragraph object by name. For an example, see "Use Style Sheet Styles" on page 11-24.

Format Objects

A format object is a MATLAB object that defines the properties and functions of a document format, such as a font family or size. The DOM API provides a set of constructors for creating format objects corresponding to most of the formatting options available in HTML, Word, and PDF documents. Most DOM document objects include a `Style` property that you can set to a cell array of format objects. You can use format objects with the document object `Style` property to format the object. For example, this code uses format objects to specify the style of a warning paragraph.

```
p = Paragraph('Danger!');
p.Style = {Color('red'),FontFamily('Arial'),FontSize('18pt')};
```

You can assign the same array of format objects to more than one DOM document object. This technique allows you to create a programmatic equivalent of a template style sheet. For example:

```
warning = {Color('red'),FontFamily('Arial'),FontSize('18pt')};
```

```
p = Paragraph('Danger!');
p.Style = warning;
p = Paragraph('Caution!');
p.Style = warning;
```

The DOM API allows you to assign any format object to any document object, regardless of whether the format applies. If the format does not apply, it is ignored.

Format Properties

Most DOM objects have a set of properties corresponding to the format options most commonly used for an object of that class. You can use dot notation to specify formats for an object. For example, this code sets the font and color of text in a paragraph, using the `Color`, `FontFamily`, and `FontSize` format properties of a `Paragraph` object. Each string after the dot corresponds to a format property.

```
p = Paragraph('Danger!');
p.Color = 'red';
p.FontFamilyName = 'Arial';
p.FontSize = '18pt';
```

Assigning a value to a format property causes the API to create an equivalent format object and assign it to the `Style` property of the document object. Similarly, assigning a format object to an object's `Style` property causes the API to assign an equivalent value to the corresponding format property, if it exists. In this way, the API keeps format properties for an object synchronized with the `Style` property of the object.

Note: When you change the value of a format property, the DOM API:

- Creates a clone of the corresponding format object
- Changes the value of the clone's corresponding format object property
- Replaces the original format object with the clone in the array of format objects assigned to the document object

In this way, the DOM prevents a change in a format property in one object from changing a style originally assigned to other objects.

Related Examples

- "Use Style Sheet Styles" on page 11-24

More About

- "Format Inheritance" on page 11-26

Use Style Sheet Styles

A style is a collection of formats that define the appearance of a document object, such as a paragraph, table, or list. You can define and name styles in templates and then assign the names to paragraphs, tables, and other document elements in your report program. The style determines how the document object renders in the output.

In a Word template, you can define styles and save styles that belong together in a style sheet (also called a *style set*). In an HTML template, you define styles in a cascading style sheet (CSS) file. You define styles for PDF documents in a CSS file, using a subset of CSS. See “Modify Styles in PDF Templates” on page 11-144.

You can apply style sheet styles to document objects using the `StyleName` property in your report program using this workflow.

1. In the template you are using with the report, define or modify styles.
2. In a DOM report, create a `Document` object that uses the template that contains your styles.
3. For the objects that you want to format with your styles, set the `StyleName` property to match the name of the style in the template.

For example, this code assigns a style named `Warning` to a paragraph object. It assumes that you have defined the `Warning` style in a Word template named `MyTemplate.dotx`. Assigning the `Warning` style to the DOM paragraph object applies the `Warning` style in the template to the paragraph when you generate the report.

```
d = Document('MyDoc','docx','MyTemplate');
p = Paragraph('Use care when unplugging this device.');
p.StyleName = 'Warning';
append(d,p);
close(d);
```

Tip Some document object constructors allow you to specify the value of the `StyleName` property as an argument. For example, this paragraph applies the style `Warning` to the paragraph containing the specified string.

```
p = Paragraph('Use care when unplugging this device','Warning');
```

Related Examples

- “Create a Microsoft Word Template” on page 11-124
- “Modify Styles in a Microsoft Word Template” on page 11-130
- “Create an HTML or PDF Template” on page 11-135
- “Modify Styles in HTML Templates” on page 11-143
- “Modify Styles in PDF Templates” on page 11-144

More About

- “Report Formatting Approaches” on page 11-21
- “Format Inheritance” on page 11-26

Format Inheritance

The DOM API allows you to use template-based styles and format object-based styles (or equivalent format properties) to specify the appearance of an object. If you set the `StyleName` and the `Style` property of an object, the formats in the `Style` property override corresponding formats specified by the template-based style of the `StyleName` property. Consider, for example, this code.

```
d = Document('MyDoc','docx','MyTemplate');
p = Paragraph('Danger!');
p.StyleName = 'Warning';
p.Style = {Color('red')};
append(d,p);
close(d);
```

Suppose that the `Warning` style defines the color of a warning as yellow. In that case, the setting of the `Style` property on the paragraph overrides the color specified by the `StyleName` setting.

If a document object does not specify a value for `StyleName`, it inherits any formats that it does not specify from its container. The container inherits any formats that it does not specify from its container, and so on, all the way to the top of a container hierarchy. Format inheritance allows you to use a single statement to assign a format for all the objects contained by a container. For example, this code uses a single `Style` property to assign a color to all the entries in a table.

```
d = Document('MyDoc');
tableArray = {'a','b';'c','d'};
table = append(d,tableArray);
table.Style = {Color('blue')};
append(d,table);
close(d);
```

Related Examples

- "Use Style Sheet Styles" on page 11-24

More About

- "Report Formatting Approaches" on page 11-21

Templates for DOM API Report Programs

The DOM API comes with default templates for each output type for formatting your report as it generates. Templates are useful for providing default design formats so that you do not need to specify them in your report. This approach is helpful if several reports have the same look, which is typical in most organizations. In your report program, you refer by name to the template and its styles and layouts. When your report generates, the template determines the appearance of the document objects.

Templates also enable form-based document generation. You can define fixed content and holes (blanks) in your template. Your report program can fill the holes with content, such as text or images. See "Form-Based Reporting" on page 11-32.

Another advantage of using templates is for maintenance. If your report design changes, you change only the template and not all the programs that use that design.

Using templates also keeps your report program smaller, because you do not need to specify properties for each object you create. For reports that are hundreds of pages, using templates might also improve performance.

You can create a copy of the default templates and customize them to specify the default formatting and layout of your reports. For the template to take effect, your report program must refer to your template and specify the style names and document parts to use.

You can create a copy of the default templates using the mlreportgen.dom.Document.createTemplate method. The default templates can serve as a starting point for your template.

Template Packages

All DOM templates, except for single-file HTML templates, consist of document, style sheet, and image files zipped into packages based on the Open Packaging Convention (OPC). You can use Microsoft Word to edit Word templates (identified by a `.dotx` extension) directly. You can also edit single-file HTML templates directly using any text or HTML editor.

To edit multifile HTML templates (identified by an `.htmtx` extension) and PDF templates (identified by a `.pdftx` extension), you must first unzip them. You can optionally rezip an edited HTML or PDF template before using it to generate a report.

The DOM API provides functions for zipping and unzipping multifile HTML and PDF templates: `zipTemplate` and `unzipTemplate`.

Styles

You can use styles defined in templates to format paragraphs, text, tables, lists, and so on. You can modify styles or create your own. See “Use Style Sheet Styles” on page 11-24.

Word templates include standard Word styles, such as Normal, Heading 1, and Title. You create and modify styles using standard Word techniques. See “Modify Styles in a Microsoft Word Template” on page 11-130.

HTML and PDF templates define styles using CSS properties in template files that end with `.css`. For details, see “Modify Styles in HTML Templates” on page 11-143 and “Modify Styles in PDF Templates” on page 11-144

Page Layout

You can use templates to define the page layout of Word and PDF reports, including the size, orientation (portrait or landscape), margins, and page headers and footers. You can use a template to define different page layouts for different sections of a document. See “Create Page Layout Sections” on page 11-148.

You can also define page layouts programmatically or use a combination of layouts that are defined programmatically and in a template.

Document Part Templates

A document part template is a template for a repeatable structure in your report. You can insert an instance of a document part in your report from your report program using a `DocumentPart` object. You create document part templates in a document part template library.

For Word templates, you define document part templates and store them in the Word Quick Parts Gallery, which serves as the library. The default template does not include any document part templates. To create them, see “Create a Microsoft Word Document Part Template Library” on page 11-37.

For HTML and PDF, the default template contains a document part template library file named `docpart_templates.html`. This file creates the library and contains some default document part templates. You can modify or delete the supplied document part templates and add your own. See “Create an HTML Document Part Template Library” on page 11-40 and “Create a PDF Document Part Template Library” on page 11-42.

See Also

mlreportgen.dom.Document.createTemplate | `unzipTemplate` | `zipTemplate`

Related Examples

- “Use Style Sheet Styles” on page 11-24
- “Modify Styles in PDF Templates” on page 11-144
- “Modify Styles in HTML Templates” on page 11-143
- “Create a Microsoft Word Document Part Template Library” on page 11-37
- “Create an HTML Document Part Template Library” on page 11-40
- “Create a PDF Document Part Template Library” on page 11-42

Create Object Containers

You can use an `mlreportgen.dom.Container` object to create an HTML container object, such as a `div`, `section`, or `article`, not otherwise supported by the DOM API and to simulate HTML format inheritance in Word output.

In HTML output, a `Container` object generates an HTML element of the type specified by its `HTMLTag` property and containing HTML elements corresponding to its DOM contents. For example, a `Container` object with the `HTMLTag` property `div` and that contains the text `Hello World` generates this markup:

```
<div><p><span>Hello World</span></p></div>
```

The generated HTML container element has the class and style properties specified by the `Container` object `StyleName` and `Style` properties, respectively. The rules of HTML CSS format inheritance ensure that the generated children of the `Container` object inherit the formats specified by the `Container` object `Style` and `StyleName` properties. For example, if the `Container` object specifies red as its text color and none of its text children specify a color, the text children are colored red.

For Microsoft Word and PDF report output, a `Container` object simulates container format inheritance. It applies the formats specified by the `Container` object `Style` attribute to each child, unless overridden by the child. It then appends the child to the output. Word and PDF output ignore the `HTMLTag` and `StyleName` properties of the `Container` object.

Tip To produce collections of document elements, you can use `mlreportgen.dom.Container` or `mlreportgen.dom.Group` objects.

- Use a container object to apply format inheritance to a set of objects and to create HTML container elements not otherwise supported by the DOM, such as div, section, and article.
- Use a group object to append the same content in multiple places in a document.

See Also

Classes
mlreportgen.dom.Container | mlreportgen.dom.Group

Related Examples

- “Use Style Sheet Styles” on page 11-24

More About

- “Report Formatting Approaches” on page 11-21

Form-Based Reporting

The DOM API supports a form-based approach to report generation. You can create a template that defines the fixed content of the form, interspersed with holes (blanks). Your DOM report program fills these holes with generated content.

Related Examples

- “Fill the Blanks in a Report Form” on page 11-33
- “Use Subforms in a Report” on page 11-35
- “Create a Microsoft Word Template” on page 11-124
- “Add Holes in a Microsoft Word Template” on page 11-125
- “Create an HTML or PDF Template” on page 11-135
- “Add Holes in HTML and PDF Templates” on page 11-137

Fill the Blanks in a Report Form

When you create a form template, you associate an ID with each hole in the template. The ID allows you to navigate the holes in a form, using the DOM `moveToNextHole` function.

The first time you execute the `moveToNextHole` function, the DOM API copies to the output document all of the text in the template up to the first hole. At this point, you can start adding content to the output document using the DOM `append` function, thereby filling in the first hole.

The next time you execute the `moveToNextHole` function, the DOM API copies all the text between the first and second hole in the template to the output document. You can then fill in the second hole by appending content to the output document. In this way, you generate the output document by copying the content from the template and filling in all its holes.

For example, this function generates a report from a Word template that has holes named `Title`, `Author`, and `Content`. The arguments `title`, `author`, and `content`, are assumed to be strings.

```
function makerpt(title,author,content,rptname,rpttemplate)
      import mlreportgen.dom.*
      rpt = Document(rptname,'docx',rpttemplate);

      while ~strcmp(rpt.CurrentHoleId,'#end#')
          switch rpt.CurrentHoleId
               case 'Title'
                   append(rpt,title);
               case 'Author'
                   append(rpt,author);
               case 'Content'
                   append(rpt,content);
           end
           moveToNextHole(rpt);
       end

      close(rpt);
```

See Also

Functions
mlreportgen.dom.Document.moveToNextHole

Related Examples

- “Use Subforms in a Report” on page 11-35
- “Create a Microsoft Word Template” on page 11-124
- “Add Holes in a Microsoft Word Template” on page 11-125
- “Create an HTML or PDF Template” on page 11-135
- “Add Holes in HTML and PDF Templates” on page 11-137

More About

- “Form-Based Reporting” on page 11-32

Use Subforms in a Report

A document part is a form that you can add to a document or to another document part. Document parts simplify generating sections of a report that have the same form, such as sections that report on the results of a series of tests or the performance of a series of financial portfolios. Use a similar approach as you do for main document forms.

1. Create a template that defines the form of the document part.
2. For each section:

   a. Create an `mlreportgen.dom.DocumentPart` object.

   b. Fill in the holes.

   c. Append the part to the main document.

For an example of a report that uses subforms, open the Functional Report example.

Tip The DOM API allows you to store the templates for document parts in the main template for a report. This capability allows you to use a single template file to supply all the templates required for a report. For details, see “Create a Microsoft Word Document Part Template Library” on page 11-37.

See Also

Functions
mlreportgen.dom.Document.moveToNextHole

Classes
mlreportgen.dom.DocumentPart

Related Examples

- “Fill the Blanks in a Report Form” on page 11-33
- “Create a Microsoft Word Template” on page 11-124
- “Add Holes in a Microsoft Word Template” on page 11-125
- “Create an HTML or PDF Template” on page 11-135
- “Add Holes in HTML and PDF Templates” on page 11-137

More About

- "Form-Based Reporting" on page 11-32

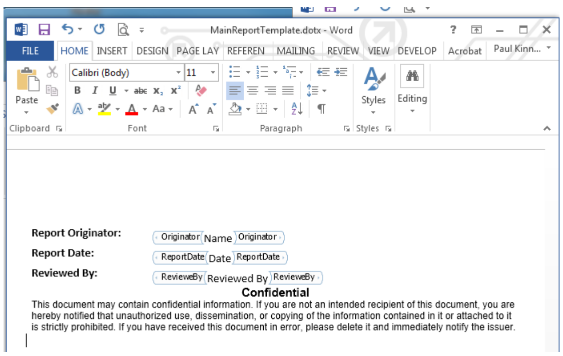
Create a Microsoft Word Document Part Template Library

A document part template library is a set of document part templates stored by name in a template file. You can create an instance of a document part based on a template stored in a library by specifying the name of the template in the document part constructor. Document part template libraries allow you to store all the templates for a report in a single template file, for example, the main template file of a report.

Create Document Part Template Library in a Word Template

You can use the Quick Parts Gallery in Word to create a document part template library in the main template of a report. A Quick Part Gallery is a collection of reusable pieces of preformatted content, called quick parts, that are stored in the document. You can use quick parts as templates for DOM `DocumentPart` objects.

1. Open the Word template in which you want to create the document part template.
2. In the template, create the Word content to serve as a prototype for the document part template. (You delete the prototype after copying it to the Quick Part Gallery.) The document part template content that you create can contain holes and page layout sections, and other types of Word content. For example:



Report Originator: Originator Name Originator
Report Date: ReportDate Date ReportDate
Reviewed By: RevieweBy Reviewed By RevieweBy

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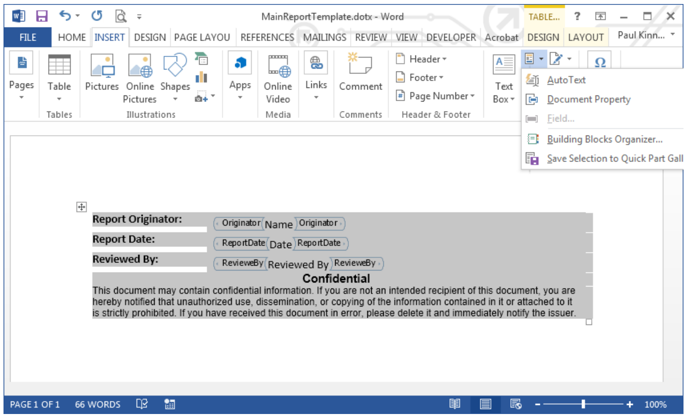
3. Select the content that you have created for the document part template.
4. On the **Insert** tab, click the **Explore Quick Parts** button. Select **Save Selection to the Quick Parts Gallery**.



Report Originator:	Originator Name Originator
Report Date:	ReportDate Date ReportDate
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5. In the Create New Building Block dialog box, in the **Name** field, enter a unique name for the template. Use this name in the constructor of a `DocumentPart` object.
6. For the first document part template you create in the template file, in the **Category** list, click `Create New Category`. Create a category named `mlreportgen`. Then select `mlreportgen` from the **Category** list.

   Otherwise, select `mlreportgen` from the **Category** list.
7. In the **Description** field, enter a template description and click **OK**.
8. Delete the content that served as the prototype for the document part template.
9. Save the template file.

Modify Document Part Template in Quick Part Gallery

You can modify a document part template stored in the Quick Part Gallery.

1. Open the Word template that contains the document part template.
2. Click in the template where you want to create an instance of the document part template.
3. On the **Insert** tab, click the **Explore Quick Parts** button.
4. In the Quick Part Gallery, to create an instance, select the document part template you want to modify.
5. Edit the instance.
6. Select the modified instance. On the **Insert** tab, click **Explore Quick Parts** and select **Save Selection to the Quick Part Gallery**.

7. In the Create New Building Block dialog box, enter the name of the document part template you modified and select the `mlreportgen` category. Respond to the prompt to overwrite the previous version.
8. Delete the instance in the template document, and save and close the template.

See Also

Classes
mlreportgen.dom.DocumentPart

Related Examples

- "Fill the Blanks in a Report Form" on page 11-33
- "Create a Microsoft Word Template" on page 11-124
- "Add Holes in a Microsoft Word Template" on page 11-125
- "Add Holes in HTML and PDF Templates" on page 11-137
- "Create a PDF Document Part Template Library" on page 11-42
- "Create an HTML Document Part Template Library" on page 11-40

More About

- "Form-Based Reporting" on page 11-32

Create an HTML Document Part Template Library

In the default template package, the file `docpart_templates.html` defines the library and some default document part templates. In your document part template library, create the document parts that you want to reuse throughout your report. You can create a part template for any part of your document that you want to repeat without redefining it programmatically.

A document part template typically consists of fixed content and holes. You can use standard HTML elements to define your templates. You can also use the `<toc>` element for a table of contents. For details, see "Create a Table of Contents" on page 11-88.

Use this workflow to work on your document part template library:

1. Unzip the template package containing the part template library file.
2. Open the document part templates file, named `docpart_templates.html` by default, in an HTML or text editor.
3. Edit the file as needed using the elements described in "HTML Document Part Template Library Structure" on page 11-40.
4. Add any styles that support the document part templates in a `.css` file in the template package. See "Modify Styles in HTML Templates" on page 11-143.
5. Save the library files you edited.
6. Repackage the template using `ziptemplate`.

HTML Document Part Template Library Structure

You create your document part library using the `<dplibrary>` element. Add a `<dplibrary>` element inside a `<body>` element. Your template package can have only one `<dplibrary>` element.

Use `<dptemplate>` elements inside a `<dplibrary>` element for each document part template that you want to create. You can create as many document part templates as you need.

This code shows the basic structure of a document part library. The `<dptemplate>` element has the attribute `name`, which you set to the name to use when you call the document part from your report program. The name is equivalent to the name of the part in the Quick Parts Gallery in Word. If you are creating templates for multiple outputs, use the same name in both places.

```
<body>
    <dplibrary>

        <dptemplate name="myFirstDocPartTemp">
            [Document part template content--holes and fixed content]
        </dptemplate>

     </dplibrary>
</body>
```

See Also
`unzipTemplate` | `zipTemplate`

Related Examples
- “Create an HTML or PDF Template” on page 11-135
- “Add Holes in HTML and PDF Templates” on page 11-137
- “Create a PDF Document Part Template Library” on page 11-42
- “Create a Microsoft Word Document Part Template Library” on page 11-37

Create a PDF Document Part Template Library

In the default template package, the file `docpart_templates.html` defines the library and some default document part templates. In your document part template library, create the document parts that you want to reuse throughout your report. You can create a part template for any part of your document that you want to repeat without redefining it programmatically.

A document part template typically consists of fixed content and holes. It can also include page layout elements that describe the page size, margins, and orientation as well as page headers and footers. You create PDF document part template libraries using DOM API HTML elements provided for this purpose and a subset of HTML elements.

Use this workflow to work on your document part template library.

1 Unzip the template package containing the part template library file.
2 Open the document part templates file, named `docpart_templates.html` by default, in an HTML or text editor.
3 Edit the file as needed using the elements described in “PDF Document Part Template Library Structure” on page 11-42.
4 Add any styles that support the document part templates in a `.css` file in the template package. See “Modify Styles in PDF Templates” on page 11-144.
5 Save the library files you edited.
6 Repackage the template using `ziptemplate`.

PDF Document Part Template Library Structure

You create your document part library using the `<dplibrary>` element. Add a `<dplibrary>` element inside a `<body>` element in your `docpart_template.html` file. Your template package can have only one `<dplibrary>` element.

Use `<dptemplate>` elements inside a `<dplibrary>` element for each document part template that you want to create. You can create as many document part templates as you need.

This code shows the basic structure of a document part library. The `<dptemplate>` element has the attribute `name`, which you set to the name that you use to call the document part. The name is equivalent to the name of the part in the Quick Parts Gallery in Word. If you are creating templates for multiple outputs, use the same name in both places.

```
<body>
    <dplibrary>

        <dptemplate name="myFirstDocPartTemp">
            [Document part template content here--
             holes, fixed content, page layout information, and HTML]
        </dptemplate>

     </dplibrary>
</body>
```

Document Part Template Library Contents

You can use DOM API HTML elements and a subset of standard HTML elements to create PDF document part templates. For examples that show how to use the DOM API HTML elements, see:

- "Create a Table of Contents" on page 11-88
- "Automatically Number Document Content" on page 11-98
- "Add Holes in HTML and PDF Templates" on page 11-137
- "Create Page Layout Sections" on page 11-148
- "Create Page Footers and Headers" on page 11-152
- "PDF and HTML Document Parts and Holes" on page 11-139
- "Create a Page Reference" on page 11-84

DOM API HTML Elements

In addition to the `<dplibrary>` and `<dptemplate>` elements that you use to define the library and the document parts, you can use these DOM API HTML elements in your PDF templates.

Purpose	Element	Attributes	Values
Page layout	`layout`	`style`	`page-margin: top bottom left right header footer gutter; page-size: height width orientation`
		`first-page-number`	Number of first page in the layout

Purpose	Element	Attributes	Values
		`page-number-format`	`n` or `N` for numeric, `a`, `A`, `i`, `I`
		`section-break`	Where to start section for this layout: `Odd Page`, `Even Page`, or `Next Page`
Page header	`pheader`	`type`	`default`, `first`, `even`
		`template-name`	Document part template that defines the header
Page footer	`pfooter`	`type`	`default`, `first`, `even`
		`template-name`	Document part template that defines the footer
Page number format (same as `first-page-number` and `page-number-format` on layout)	`pnumber`	`format`	`n` or `N` for numeric, `a`, `A`, `i`, `I`
		`initial-value`	The number for the first page in the layout that uses this element
Hole	`hole`	`id`	String that identifies hole by name
		`default-style-name`	Style sheet style to use when style is not set programmatically
Table of contents	`toc`	`number-of-levels`	Number of heading levels to include in TOC
		`leader-pattern`	Leader pattern to use: `dots`, `space`, period, or space
Automatic numbering	`autonumber`	`stream-name`	Name of the stream specified by a `counter-increment` style
Current page number	`page`	No attributes	
Total number of pages in document	`numpages`	No attributes	

Purpose	Element	Attributes	Values
Page break	`pagebreak`	No attributes	
Numeric reference to page where target is located	`pageref`	`target`	ID of target; create target in your report using mlreportgen.dom.LinkTarget
Insert content of a heading or other style into a page header or footer (for running headers and footers)	`styleref`	No attributes	Inserts content of nearest `h1` element
		`style-name`	Name of the style with content to insert in the header or footer
		`outline-level`	Outline level of style with content to insert in the header or footer

For detailed information on the attributes, see the properties for these corresponding DOM API classes.

- mlreportgen.dom.PDFPageLayout
- mlreportgen.dom.PDFPageHeader
- mlreportgen.dom.PDFPageFooter
- mlreportgen.dom.TOC
- mlreportgen.dom.AutoNumber
- mlreportgen.dom.PageRef
- mlreportgen.dom.StyleRef

Standard HTML Elements

You can use these standard HTML elements in PDF templates.

HTML Element	Attributes
`a`	`class`, `style`, `href`, `name`
`b`	`class`, `style`
`body`	`class`, `style`
`br`	n/a

HTML Element	Attributes
code	class, style
del	class, style
div	class, style
font	class, style, color, face, size
h1, h2, h3, h4, h5, h6	class, style, align
hr	class, style, align
i	class, style
ins	class, style
img	class, style, src, height, width, alt
li	class, style
ol	class, style
p	class, style, align
pre	class, style
s	class, style
span	class, style
strike	class, style
sub	class, style
sup	class, style
table	class, style, align, bgcolor, border, cellspacing, cellpadding, frame, rules, width
tbody	class, style, align, valign
tfoot	class, style, align, valign
thead	class, style, align, valign
td	class, style, bgcolor, height, width, colspan, rowspan, valign, nowrap
tr	class, style, bgcolor, valign
tt	class, style

HTML Element	Attributes
`u`	`class`, `style`
`ul`	`class`, `style`

For information about these elements, see the W3Schools tags documentation at www.w3schools.com/tags.

See Also

`unzipTemplate` | `zipTemplate`

Related Examples

- “Create an HTML or PDF Template” on page 11-135
- “Add Holes in HTML and PDF Templates” on page 11-137
- “Create an HTML Document Part Template Library” on page 11-40
- “Create a Microsoft Word Document Part Template Library” on page 11-37

Object-Oriented Report Creation

Note: For information on object-oriented programming in MATLAB, see “Object-Oriented Programming”.

The DOM API supports an object-oriented approach to creating report programs. With this approach, you subclass the DOM `Document` and `DocumentPart` classes to create document and document part classes tailored to your report application. You then create instances of these classes to generate a report.

Related Examples

- “Simplify Filling in Forms” on page 11-49

Simplify Filling in Forms

The object-oriented approach allows you to use the DOM `fill` method to simplify form-based reporting. The `fill` method is intended for instances of classes derived from the `mlreportgen.dom.Document` or `mlreportgen.dom.DocumentPart` class. It assumes that for each hole in a document or document part template, the derived class defines a method having this signature:

```
fillHoleID(obj)
```

The `HoleID` part of the signature is the ID of a hole defined by the document or document part template. The `obj` argument is an instance of the derived class. For example, supposed that a template defines a hole named `Author`. Then the derived class defines a method name `fillAuthor` to fill the `Author` hole. Assuming that the derived class defines methods for filling the holes, the `fill` method moves from the first hole in the document or part to the last, invoking the corresponding `fillHoleID` method to fill each hole.

The `fill` method eliminates the need for a report program to loop explicitly through the holes in a document or document part's template. The report need only invoke the document or part `fill` method. For example, suppose that you have derived a report class, name `MyReport`, from the `mlreportgen.dom.Document` class and that this derived class defines methods for each of the holes defined by the report template, based on data supplied in its constructor. Then, you need only three lines to generate an instance of `MyReport`:

```
function makeReport(rptdata)
rpt = MyReport(rptdata);
fill(rpt);
close(rpt);
```

For an example of a forms-based, object-oriented report program, in the **Examples** pane of the MATLAB Report Generator documentation, open the Object-Oriented Report example.

See Also

Functions

mlreportgen.dom.Document.moveToNextHole

Classes

mlreportgen.dom.DocumentPart

Related Examples

- “Use Subforms in a Report” on page 11-35
- “Fill the Blanks in a Report Form” on page 11-33
- “Create a Microsoft Word Template” on page 11-124
- “Add Holes in a Microsoft Word Template” on page 11-125
- “Create an HTML or PDF Template” on page 11-135
- “Add Holes in HTML and PDF Templates” on page 11-137

More About

- “Form-Based Reporting” on page 11-32

Create and Format Text

In this section...

Create Text

You can create text by appending a string to a document, paragraph, table entry, or list item. The DOM `append` function converts the string to a `Text` object, appends it, and returns the `Text` object. Use the `Text` object to format the text. You can also create a text object directly and append it to a document. This example:

- Creates the `Text` object `t1` by appending the string `'Hello'` to the document
- Uses a `Text` constructor to create a `Text` object and append the text `'World'` to the document

```
import mlreportgen.dom.*
d = Document('mydoc','html');

t1 = append(d,'Hello');

append(d,Text('World'));

close(d);
rptview(d.OutputPath);
```

Create Special Characters

You can define special characters, such as the British pound symbol, to include in a report by creating an `mlreportgen.dom.CharEntity` object. Specify a name of a character entity listed at http://en.wikipedia.org/wiki/List_of_XML_and_HTML_character_entity_references. For example:

```
import mlreportgen.dom.*;
d = Document('test','html');
```

```
p = Paragraph(CharEntity('pound'));
append(d,p);
append(p,'3');

close(d);
rptview(d.OutputPath);
```

Append HTML or XML Markup

To append HTML markup to an HTML document or Microsoft Word XML markup to a Word document, use an `mlreportgen.dom.RawText` object. This technique is useful for creating HTML or Word elements that the DOM API does not support directly. This example shows how to create a `RawText` object to append HTML markup.

```
import mlreportgen.dom.*;
d = Document('test','html');

append(d,RawText('<em>Emphasized Text</em>'));

close(d);
rptview('test','html');
```

Format Text

You can format text programmatically, using either DOM format objects or `Text` object format properties. You can also use template styles. For information about these formatting techniques and format inheritance, see “Report Formatting Approaches” on page 11-21.

Format Text Programmatically

You can use format objects to format `Text` objects or format properties to specify commonly used text formats. This example uses:

- A `FontFamily` format object to specify the primary and backup font
- The `Bold` format property to specify text weight

```
import mlreportgen.dom.*;
d = Document('test','html');

t = append(d,'Bold Arial text');
```

```
fontFamily = FontFamily('Arial');
fontFamily.BackupFamilyNames = {'Helvetica'};
t.Style = {fontFamily};

t.Bold = true;

close(d);
rptview(d.OutputPath);
```

Use these format objects and format properties to format text.

Formatting	Format Object	Format Property
Font	`FontFamily`	`FontFamilyName`
Backup font (HTML only)	`FontFamily`	n/a
Complex script font (for example, Arabic)	`FontFamily`	n/a
East Asian font	`FontFamily`	n/a
Font size	`FontSize`	`FontSize`
Foreground color	`Color`	`Color`
Background color	`BackgroundColor`	`BackgroundColor`
Bold	`Bold`	`Bold`
Italic	`Italic`	`Italic`
Subscript or superscript	`VerticalAlign`	n/a
Strike through	`Strike`	`Strike`
Underline type (single, double, etc.)	`Underline`	`Underline`
Underline color	`Underline`	n/a
Preserve white space	`WhiteSpace`	`WhiteSpace`
Display as specified	`Display`	n/a

Format Text Using Microsoft Word Style Sheets

You can format a paragraph using a style defined in the Word template used to generate the report.

To define a text style in a Word template, start by using these steps:

1. Open the Word template used with the report.
2. Open the **Styles** pane.
3. Click the **Manage Styles** button .
4. Click **New Style**.
5. In the Create New Style from Formatting dialog box, set **Style type** to `Character` or `Linked (paragraph and character)`.

For more information about working with Word styles, see “Modify Styles in a Microsoft Word Template” on page 11-130.

Format Text for HTML and PDF Using Style Sheets

You can format text using a style defined in the template used to generate the report. Apply a template style to a `Text` object either as the second argument in a `Text` object constructor or by setting the `StyleName` property to a template style.

To define the style, use cascading style sheet (CSS) syntax. Use a selector on the `span` element to specify the style name. This CSS defines a style named `Pass`.

```
span.Pass {
  font-family: "Times New Roman", Times, serif;
  color: green;
}
```

You can use any CSS properties and selectors in HTML templates. For PDF templates, you can use a subset of CSS properties and selectors. See “Modify Styles in PDF Templates” on page 11-144.

Apply a Style to a Text Object

Apply a template style to a `Text` object either as the second argument in a `Text` object constructor or by setting the `StyleName` property to a template style. Suppose you have defined styles named `Body`, `Pass`, and `Fail` in the template for your report. You can then apply the styles.

```
import mlreportgen.dom.*;
passed = rand(1) >= 0.5;
rpt = Document('MyReport','html','MyTemplate');
```

```
t1 = Text('Test status: ');
t1.StyleName = 'Body';
t1.WhiteSpace = 'preserve';

if passed
  status = 'Passed';
  statusStyle = 'Pass';
else
  status = 'Failed';
  statusStyle = 'Fail';
end

t2 = Text(status,statusStyle);
statusPara = Paragraph(t1);
append(statusPara,t2);
append(rpt, statusPara);

close(rpt);
rptview(rpt.OutputPath);
```

Override Template Formats

You can use programmatic formats to override the formats defined in a template-based style. Suppose that you define a style named `AlertLevel` in your template that sets the color to green. You can override the style in your report program to set a color based on the current alert level:

```
t = Text('Danger!','AlertLevel');
t.Color = 'red';
```

See Also

Classes

mlreportgen.dom.Bold | mlreportgen.dom.CharEntity | mlreportgen.dom.FontFamily | mlreportgen.dom.FontSize | mlreportgen.dom.Italic | mlreportgen.dom.Strike | mlreportgen.dom.Text | mlreportgen.dom.Underline

Related Examples

- "Add Content to a Report" on page 11-11
- "Modify Styles in HTML Templates" on page 11-143

More About

- "Report Formatting Approaches" on page 11-21

Create and Format Paragraphs

In this section...

Create a Paragraph

You can create a paragraph by using an `mlreportgen.dom.Paragraph` constructor with a text string. For example:

```
p = Paragraph('Text for a paragraph');
```

You can also specify these DOM objects in a `Paragraph` object constructor.

- `mlreportgen.dom.Text`
- `mlreportgen.dom.ExternalLink`
- `mlreportgen.dom.InternalLink`
- `mlreportgen.dom.LinkTarget`
- `mlreportgen.dom.Image`

Create a Heading

A heading is a type of paragraph. You can use `mlreportgen.dom.Heading1`, `Heading2`, and so on, to create headings. Alternatively, you can use a `mlreportgen.dom.Heading` object if you want to use programmatically derived values for the heading level.

This example creates a first-level heading with the text `Chapter 1: System Overview`. If you create a table of contents, this heading appears at the top level.

```
h1 = Heading1('Chapter 1: System Overview');
```

Format a Paragraph

You can format a paragraph using DOM format objects or format properties. You can also use template styles. For information about these formatting techniques and format inheritance, see "Report Formatting Approaches" on page 11-21.

Note: You can use the same format objects and properties for heading objects (`Heading` and `Heading1`, `Heading2`, and so on) as you do for `Paragraph` objects.

Format a Paragraph Programmatically

You can use DOM API format objects to format `Paragraph` objects or format properties to specify commonly used paragraph formats. This example uses:

- An `OuterMargin` format object to specify the margins for the paragraph
- The `HAlign` format property to center the paragraph

```
import mlreportgen.dom.*;
d = Document('test','html');

p = Paragraph('Indent a half inch and space after 12 points.');
p.Style = {OuterMargin('0.5in','0in','0in','12pt')};
append(d,p);

p = Paragraph('Centered paragraph');
p.HAlign = 'center';
append(d,p);

close(d);
rptview(d.OutputPath);
```

Use these objects and properties to format a paragraph.

Formatting	Format Object	Format Property
Font	`FontFamily`	`FontFamilyName`
Backup font (HTML only)	`FontFamily`	n/a
Complex script font (for example, Arabic)	`FontFamily`	n/a
East Asian font	`FontFamily`	n/a
Font size	`FontSize`	`FontSize`
Foreground color	`Color`	`Color`
Background color	`BackgroundColor`	`BackgroundColor`
Bold	`Bold`	`Bold`
Italic	`Italic`	`Italic`

Formatting	Format Object	Format Property
Subscript or superscript	`VerticalAlign`	n/a
Strike through	`Strike`	`Strike`
Underline type	`Underline`	`Underline`
Underline color	`Underline`	n/a
Create border around paragraph	`Border`	n/a
Preserve white space	`WhiteSpace`	`WhiteSpace`
Indent a paragraph	`OuterMargin`	`OuterLeftMargin`
Indent first line of paragraph	`FirstLineIndent`	`FirstLineIndent`
Hanging indent	`FirstLineIndent`	n/a
Space before and after paragraph	`OuterMargin`	n/a
Space to right of paragraph	`OuterMargin`	n/a
Space between paragraph and its bounding box	`InnerMargin`	n/a
Space between paragraph lines	`LineSpacing`	n/a
Align paragraph left, center, right	`HAlign`	`HAlign`
Start paragraph on next page	`PageBreakBefore`	n/a
Keep with next paragraph	`KeepWithNext`	n/a
Keep paragraph on same page	`KeepLinesTogether`	n/a
Eliminate widows and orphans	`WidowOrphanControl`	n/a
Table of contents level of paragraph	`OutlineLevel`	`OutlineLevel`
Display as specified	`Display`	n/a

Format Paragraphs for Microsoft Word Using Template Styles

You can format a paragraph using a style in a Word template. You can add styles to the template or modify existing ones.

To add a paragraph style:

1. Open the Word template used with the report.
2. Open the **Styles** pane.
3. Click the **Manage Styles** button.
4. Click **New Style**.
5. In the Create New Style from Formatting dialog box, set **Style type** to `Character` or `Linked (paragraph and character)`.
6. Format the style as needed.

For more information about working with Word styles, see “Modify Styles in a Microsoft Word Template” on page 11-130.

Format Paragraphs Using PDF or HTML Template Styles

You can format a paragraph using a style in an HTML or PDF style sheet in your template. You can add styles to the template or modify existing ones.

Define the style using a selector on a `p` element. This example defines a `BodyPara` paragraph style.

```
p.BodyPara {
  font-family: "Times New Roman", Times, serif;
  font-style: normal;
  font-size: 11pt;
  color: black;
  margin-left: 0.5in;
}
```

You can use any CSS properties and selectors in HTML templates. For PDF templates, you can use a subset of CSS properties and selectors. See “Modify Styles in PDF Templates” on page 11-144.

For more information about using HTML styles with DOM objects, see “Modify Styles in HTML Templates” on page 11-143.

Apply a Style to a Paragraph Object

Apply a template style to a `Paragraph` object either as the second argument in a `Paragraph` object constructor or by setting the `StyleName` property on the paragraph to a template style.

Suppose that you have defined styles named `BodyPara` and `MyTitle` in a template. This example first specifies a style name in a `Paragraph` constructor. It then specifies the style in a `Paragraph` object `StyleName` format property. This example assumes both styles are defined in `MyTemplate`.

```
import mlreportgen.dom.*;
rpt = Document('MyReport','html','MyTemplate');

% Specify style name using an argument when you create the Paragraph
p = Paragraph('Format this paragraph using a body style.','BodyPara');
append(rpt,p);

p = Paragraph('This paragraph is formatted using a title style.');

% Specify  style name using a property on the paragraph
p.StyleName = 'MyTitle';
append(rpt,p);

close(rpt);
rptview(rpt.OutputPath);
```

Override Template Formats

You can use programmatic formats to override the paragraph formats defined in a template-based paragraph style. Suppose that you define a paragraph style named `BodyPara` in your Word template and set the `KeepWithNext` property to `off`. You can override the style in your report program to keep a particular paragraph on the same page with the next paragraph:

```
import mlreportgen.dom.*;
rpt = Document('MyReport','docx','MyTemplate');

p = Paragraph('Keep this body paragraph with next.','BodyPara');
p.Style = {'KeepWithNext'};
append(rpt,p);

p = Paragraph('Next paragraph.');
append(rpt, p);
```

```
close(rpt);
rptview(rpt.OutputPath);
```

See Also

Classes
mlreportgen.dom.Bold | mlreportgen.dom.Display | mlreportgen.dom.FontFamily | mlreportgen.dom.FontSize | mlreportgen.dom.Italic | mlreportgen.dom.KeepLinesTogether | mlreportgen.dom.KeepWithNext | mlreportgen.dom.LineSpacing | mlreportgen.dom.PageBreakBefore | mlreportgen.dom.Paragraph | mlreportgen.dom.Strike | mlreportgen.dom.Text | mlreportgen.dom.Underline

Related Examples

- “Add Content to a Report” on page 11-11

More About

- “Report Formatting Approaches” on page 11-21

Create and Format Lists

In this section...
"Create an Ordered or Unordered List" on page 11-63
"Create a Multilevel List" on page 11-65
"Format Lists" on page 11-66

You can add two kinds of lists to a report:

- Unordered (bulleted)
- Ordered (numbered)
- Multilevel (lists that contain ordered or unordered lists in any combination)

Create an Ordered or Unordered List

You can create lists from a numeric or cell array or one item at a time.

- Creating a list from a cell array allows you to include items of different types in the list.
- Creating a list one item at a time is useful for including multiple objects in a list item.

Create an Unordered List from an Array

You can create an unordered list by appending a one-dimensional numeric or cell array to a document (or document part). The `append` function converts the array to an `mlreportgen.dom.UnorderedList` object, appends the object to the document, and returns the object, which you can then format. In the cell array, you can include strings, numbers, and some DOM objects, such as a `Text` object. For a list of DOM objects you can include, see mlreportgen.dom.ListItem.

```
import mlreportgen.dom.*;
d = Document('myListReport','html');

t = Text('third item');
append(d,{'first item',6,t,'fourth item'});

close(d);
rptview(d.OutputPath);
```

Create a List Using an Array

You can create an unordered or ordered list from an array by including the array in an `UnorderedList` or `OrderedList` object constructor. In the cell array, you can include strings, numbers, and some DOM objects, such as a `Text` object. For a list of DOM objects you can include, see mlreportgen.dom.ListItem.

This example creates an unordered list. Change the `UnorderedList` class to `OrderedList` to number the items.

```
import mlreportgen.dom.*;
d = Document('unorderedListReport','html');

ul = UnorderedList({Text('item1'),'item 2',3});
append(d,ul);

close(d);
rptview(d.OutputPath);
```

Create a List Item by Item

You can create a list one item at a time by creating `mlreportgen.dom.ListItem` objects and appending them to an `UnorderedList` or `OrderedList` object.

This example creates an ordered list. Change the `OrderedList` class to `UnorderedList` to use bullet items.

```
import mlreportgen.dom.*;
d = Document('unorderedListReport','html');

li1 = ListItem('Rank 3 magic square:');
table = append(li1,Table(magic(3)));
table.Border = 'inset';
table.Width = '1in';
li2 = ListItem('Second item');
li3 = ListItem('Third item');

ul = OrderedList();
append(ul,li1);
append(ul,li2);
append(ul,li3);

append(d,ul);
```

```
close(d);
rptview(d.OutputPath);
```

Create a Multilevel List

A multilevel list is an ordered or unordered list whose list items contain ordered or unordered lists. You can create lists that have as many as nine levels.

You can create multilevel lists either from cell arrays or one list at a time. Creating a multilevel list one item at a time is useful for creating list items that contain multiple paragraphs, paragraphs and tables, and other combinations of document elements.

Create a Multilevel List from a Cell Array

You can use any of these approaches to create a multilevel list from a cell array.

- Nest one-dimensional cell arrays representing sublists in a one-dimension cell array representing the parent list.

  ```
  import mlreportgen.dom.*;
  d = Document('orderedListReport','html');

  ol = OrderedList({'step 1','step 2',...
       {'option 1','option 2'},...
       'step 3'});
  append(d,ol);

  close(d);
  rptview(d.OutputPath);
  ```
- Include list objects as members of a one-dimensional cell array representing the parent list. Use this approach to create ordered sublists from cell arrays.

  ```
  d = Document('myListReport','html');

  append(d,{'1st item',OrderedList({'step 1','step 2'}),'2nd item'});

  close(d);
  rptview(d.OutputPath);
  ```
- Combine the nested cell array and nested list object approaches.

Create a Multilevel List One List at a Time

You can create a multilevel list from scratch by appending child lists to parent lists.

```
import mlreportgen.dom.*;
d = Document('orderedListReport','html');

ol = OrderedList({'Start MATLAB', ...
     'Create a rank 3 or 4 magic square:'});
optionList = UnorderedList;
li = ListItem('>> magic(3)');
table = append(li,Table(magic(3)));
table.Width = '1in';
append(optionList, li);
li = ListItem('>> magic(4)');
table = append(li,Table(magic(4)));
table.Width = '1in';
append(optionList,li);
append(ol, optionList);
append(ol, ListItem('Close MATLAB'));,
append(d,ol);
close(d);
rptview('orderedListReport','html');
```

Format Lists

You can use list styles defined in a report style sheet to specify the indentation of each level of a list and the type of bullet or the number format used to render list items. For PDF and HTML, you can specify the bullet type or numbering type in the style sheet or using the mlreportgen.dom.ListStyleType format property on a `ListItem` object.

To use a template-defined list style to format a list, set the `StyleName` property of the list to the name of the style. For example:

```
import mlreportgen.dom.*;
d = Document('myListReport','html','MyTemplate');

list = append(d,{'first item',...
    OrderedList({'step 1','step 2'}),'second item'});
list.StyleName = 'MyListStyle';

close(d);
rptview('myListReport','html');
```

Note: A list style determines how list items are rendered regardless of the list type. If you do not specify a list style, the DOM API uses a default list style that renders the list according to type. For example, the default list style for unordered lists uses bullets to render list items. If you specify a list style for an `UnorderedList` object that numbers top-level items, the top-level items are numbered, even though the object type is unordered (bulleted).

Create a Word List Style

To define a list style in a Word template, select `List` as the style type in the Create New Style from Formatting dialog box. See "Add Styles to a Word Template" on page 11-131.

Create an HTML or PDF List Style

To define a list style in an HTML or PDF template cascading style sheet (CSS), use the `ul` element for unordered list styles and the `ol` element for ordered list styles. You can use the child selector (>) to define multilevel list styles.

For example, this CSS code defines the appearance of a two-level unordered list that can contain ordered or unordered sublists.

```
ul.MyUnorderedList {
 list-style-type:disc;
}

ul.MyUnorderedList > ul {
 list-style-type:circle;
}

ul.MyUnorderedList > ol {
 list-style-type:decimal;
}
```

For information about editing CSS, see documentation such as the W3Schools.com CSS tutorial.

See Also

Classes
mlreportgen.dom.ListItem | mlreportgen.dom.ListStyleType | mlreportgen.dom.OrderedList | mlreportgen.dom.UnorderedList

Functions
mlreportgen.dom.OrderedList.append

Related Examples

- "Use Style Sheet Styles" on page 11-24

Create and Format Tables

In this section...

Two Types of Tables

You can use the DOM API to create two types of tables that differ in structure.

- An informal table (i.e., a table) consists of rows that contain table entries.
- A formal table contains a header, a body, and a footer section. Each section contains rows that contain table entries.

Informal tables are useful for most of your reporting needs. Use formal tables for tables whose headers or footers contain multiple rows.

For details about informal tables, see:

- "Create a Table from a Two-Dimensional Array" on page 11-70
- "Create a Table Using the Table entry Function" on page 11-70
- "Create a Table from Scratch" on page 11-71
- "Format a Table" on page 11-72

For details about formal tables, see:

- "Create a Formal Table" on page 11-77

- “Format a Formal Table” on page 11-77

Create a Table from a Two-Dimensional Array

You can create a table by appending a two-dimensional numeric array or a cell array containing built-in MATLAB data (strings and numbers) and DOM objects (`Text`, `Table`, `Image`, etc.) to a document. The `append` function converts the array to a `Table` object, appends it to the document, and returns the `Table` object, which you can then format. You can also create a `Table` object directly by including a two-dimensional array in its constructor.

This example shows how to create a table from a numeric array and another table from a cell array of various object types. The cell array contains a magic square, which is rendered as an inner table. The cell array also includes a `Text` object constructor that uses the `AlertLevel` template style.

```
import mlreportgen.dom.*;
doc = Document('test');

table1 = append(doc,magic(5));
table1.Border = 'single';
table1.ColSep = 'single';
table1.RowSep = 'single';

ca = {'text entry',Paragraph('a paragraph entry'); ...
       Text('Danger!','AlertLevel'),magic(4)};
table2 = Table(ca);
append(doc,table2);

close(doc);
rptview(doc.OutputPath);
```

Create a Table Using the Table entry Function

You can use the `entry` function with a `Table` object to add content to a table entry or to format an entry. This approach is useful when you need to format table entries individually. For example:

```
import mlreportgen.dom.*;
doc = Document('test');

a = magic(5);
```

```
[v,i] = max(a);
[v1,i1] = max(max(a));
table = Table(a);

text = table.entry(i(i1),i1).Children(1);
text.Color = 'red';
append(doc,table);

close(doc);
rptview(doc.OutputPath);
```

Create a Table from Scratch

You can create a table from scratch by creating `TableEntry` objects, appending them to `TableRow` objects, and appending the `TableRow` objects to a `Table` object. This approach is useful when you need to create table entries that span multiple columns or rows that have a different number of entries. This example shows how to create a table with four columns and two rows. In the first table row, the second entry spans the second and third columns.

```
import mlreportgen.dom.*;
doc = Document('test');

table = Table(4);
table.Border = 'single';
table.ColSep = 'single';
table.RowSep = 'single';

row = TableRow;
append(row, TableEntry('entry 11'));
te = TableEntry('entry 12-13');
te.ColSpan = 2;
te.Border = 'single';
append(row, te);
append(row, TableEntry('entry 14'));
append(table,row);

row = TableRow;
for c = 1:4
  append(row, TableEntry(sprintf('entry 2%i', c)));
end
append(table,row);
append(doc,table);

close(doc);
rptview(doc.OutputPath);
```

Format a Table

You can format a table programmatically, using DOM format objects or format properties. You can also use template styles. For information about these formatting techniques and format inheritance, see "Report Formatting Approaches" on page 11-21.

Format a Table Programmatically

You can use format objects to format tables or use `Table` format properties to specify commonly used table formats. This example uses:

- `Border`, `ColSep`, and `RowSep` format objects to specify a red table border and the green column and row separators
- The `Width` format property to specify the table width

```
import mlreportgen.dom.*;
d = Document('test','html');

table = Table(magic(5));
table.Style = {Border('inset','red','3px'), ...
               ColSep('single','green','1px'), ...
               RowSep('single','green','1px')};

table.Width = '50%';

append(d, table);

close(d);
rptview(d.OutputPath);
```

Use these format objects and format properties to format a table.

Formatting	Format Object	Format Property
Width of table	`Width`	`Width`
Color of table background	`BackgroundColor`	`BackgroundColor`
Create border around table	`Border`	`Border`

Formatting	Format Object	Format Property
Color of border	`Border`	`BorderColor`
Thickness of border	`Border`	`BorderWidth`
Create left, right, top, or bottom table border	`Border`	n/a
Collapse table and table entry borders (HTML)	`BorderCollapse`	`BorderCollapse`
Create column separator	`ColSep`	`ColSep`
Column separator color	`ColSep`	`ColSepColor`
Column separator thickness	`ColSep`	`ColSepWidth`
Create row separator	`RowSep`	`RowSep`
Row separator color	`RowSep`	`RowSepColor`
Row separator thickness	`RowSep`	`RowSepWidth`
Indent table from left margin	`OuterMargin`	`OuterLeftMargin`
Space before or after table	`OuterMargin`	n/a
Space to right of table	`OuterMargin`	n/a
Align table left, right, or center	`HAlign`	`HAlign`
Specify table entry flow direction (left-to-right or right-to-left)	`FlowDirection`	`FlowDirection`
Resize table columns to fit contents	`ResizeToFitContents`	n/a

Format Table Entries

A `Table` object has properties that allow you to specify the same format or set of formats for all its entries.

Formatting	Table Object Property
Align entries vertically (top, middle, bottom)	`TableEntriesValign`

Formatting	Table Object Property
Align entries horizontally (left, right, center)	`TableEntriesHalign`
Create space (padding) between entry boundary and content	`TableEntriesInnerMargin`
Apply a set of format objects to all table entries	`TableEntriesStyle`

You can use a mlreportgen.dom.TextOrientation format object to make the text in a table entry vertical or horizontal.

Keep a Table and Title on the Same Page

Use the `KeepLinesTogether` and `KeepWithNext` paragraph formats to keep a table title and the table together on the same page. This example creates a table title, creates table content, and makes the table header row bold, using table entry indexing. To keep the table on the same page, the code specifies `KeepLinesTogether` and `KeepWithNext` for all rows except the last row. The last row has only `KeepLinesTogether` set and not `KeepWithNext`. This prevents the table from being forced to stay with the paragraph that follows.

```
import mlreportgen.dom.*
rpt = Document('test','docx');

p = Paragraph('Table 1');
p.Style = {Bold,KeepLinesTogether,KeepWithNext};
append(rpt, p);

ca = {Paragraph('Col 1'),Paragraph('Col 2'); ...
      Paragraph('data 11'),Paragraph('Data 12'); ...
      Paragraph('data 21'),Paragraph('Data 22')};

ca{1,1}.Children(1).Bold = true;
ca{1,2}.Children(1).Bold = true;

for r = 1:2
    for c = 1:2
        ca{r, c}.Style = {KeepLinesTogether,KeepWithNext};
    end
end
```

```
for c = 1:2
    ca{3, c}.Style = {KeepLinesTogether};
end

 append(rpt, ca);

close(rpt);
rptview(rpt.OutputPath);
```

Format a Table Using Microsoft Word Style Sheets

You can format tables using an existing Word style in a template or a template style that you modify or add.

To define a table style in a Word template, start by using these steps.

1. Open the Word template used with the report.
2. Open the **Styles** pane.
3. Click the **Manage Styles** button .
4. Click **New Style**.
5. In the Create New Style from Formatting dialog box, set **Style type** to `Table`.

For more information about using Word styles with DOM objects, see “Modify Styles in a Microsoft Word Template” on page 11-130.

Format an HTML or PDF Table Using a Style Sheet

You can format HTML and PDF tables using a CSS style defined in a template.

To define a table style in an HTML or PDF template, use a selector on a `table` style. For example:

```
table.MyTable {
  border-bottom-color: rgb(128, 128, 128);
  border-bottom-width: thin;
  border-collapse: collapse;
}
```

Tip Use the CSS child selector (>) to specify the format of the children of a table. For example, this CSS code specifies the format of the table entries (`td` elements) of a table whose style is `MyTable`.

```
table.MyTable > tr > td {
  font-family: Arial, Helvetica, sans-serif;
  font-size: 11pt;
  text-align: center;
}
```

Apply a Style to a Table

Once you have defined a table style in a template, you can apply it to a `Table` object in your report program either as the second argument in the `Table` object constructor or by setting it to the `StyleName` property of the `Table` object. For example, suppose that you defined styles named `BodyPara`, `TableTitle`, and `RuledTable` in the template for your report. This example specifies style names in a `Paragraph` constructor, in the `StyleName` property of a `Paragraph` object, and in a `Table` constructor.

```
import mlreportgen.dom.*;
rank = 5;
rpt = Document('MyReport','html','MyTemplate');

p = Paragraph('Here is a magic square or rank 5:','BodyPara');
append(rpt,p);

p = Paragraph(sprintf('Rank %d MagicSquare',rank));
p.StyleName = 'TableTitle';

append(rpt,Table(magic(rank),'RuledTable'));

close(rpt);
rptview(rpt.OutputPath);
```

You can use programmatic formats to override the styles defined in a template-based table style. For example, suppose that you define a table style named `UnruledTable` in your template to create tables without any borders or column or row separators. You can then override the style in your report program to draw a frame around a table.

```
import mlreportgen.dom.*;
rpt = Document('MyReport','html','MyTemplate');

table = Table(magic(5),'UnruledTable');
table.Border = 'single';
append(rpt,table);

close(rpt);
```

```
rptview(rpt.OutputPath);
```

Create a Formal Table

To create a formal table, use the same basic approaches as with an informal table, except that you use an `mlreportgen.domlFormalTable` constructor to construct a formal table. The constructor optionally accepts a two-dimensional numeric array or a cell array of MATLAB data for the body, header, and footer sections.

If you build a formal table completely or partially from scratch, you can use the `FormalTable` object functions `appendHeaderRow` and `appendBodyRow` to append rows to the table header and footer sections. The `FormalTable.append` function appends a row to the body section. Alternatively, you can access a section using the `Header`, `Body`, or `Footer` properties of the `FormalTable` object.

```
import mlreportgen.dom.*
d = Document('test');

t = FormalTable({'a','b';'c','d'});

r = TableRow();
append(r,TableEntry('Column 1'));
append(r,TableEntry('Column 2'));
append(t.Header,r);

append(d,t);

close(d);
rptview(d.OutputPath);
```

Format a Formal Table

You can format a formal table programmatically, using DOM format objects or format properties. You can also use template styles. For information about these formatting techniques and format inheritance, see “Report Formatting Approaches” on page 11-21.

Format a Formal Table Programmatically

You can format a formal table programmatically the same way you format an informal table. The format objects and properties that apply to an informal table also apply to formal tables. In addition, you can format the header, body, and footer sections of an informal table programmatically. If you specify a format for the table and one of its sections, the value you specify for the section overrides the value you specify for the table as a whole. Not all formal table formats apply to formal table sections. For example, you cannot indent a header, body, or footer section independently of the containing table. In other words, the `OuterLeftMargin` property does not apply to formal table sections.

Apply Table Styles to a Formal Table and Its Sections

Use the same procedure for defining formal table styles in templates as you use for defining informal table styles.

You can apply a table style to a formal table and to each of its sections. If you apply a table style to the table itself and to one of its sections (for example, the header), the section style overrides the table style.

Note: If you apply a table style to one or more sections of a Word formal table, specify the widths of each of the table columns. Otherwise, the columns of the sections might not line up.

Create and Format Table Rows

If you want to build a table from scratch, you can use the `TableRow` constructor to create the rows. Format the rows and then append the rows to a table that you are building.

Create a Table Row

The `mlreportgen.dom.TableRow` constructor takes no arguments and returns a `TableRow` object. You can then create and append `TableEntry` objects to the object to complete the row construction. Once you construct the row, you can add the row to the table, using the `append` function. This example creates a two-column table with two rows.

```
import mlreportgen.dom.*
rpt = Document('test');

table = Table(2);

row = TableRow();
append(row,TableEntry('Col1'));
append(row,TableEntry('Col2'));
append(table,row);
```

```
row = TableRow();
append(row,TableEntry('data11'));
append(row,TableEntry('data12'));
append(table,row);

append(rpt,table);

close(rpt);
rptview(rpt.OutputPath);
```

Format a Table Row

Use these format objects and format properties to format a table row.

Row Height Formatting	Format Object	Format Property
Specify the exact height of a row	`RowHeight`	`Height`
Specify the minimum height of row (Word only)	`RowHeight`	n/a
Cause this row to repeat as header row when a table flows across pages	`RepeatAsHeaderRow`	n/a
Allow this row to straddle a page boundary	`AllowBreakAcrossPages`	n/a

Format Table Columns

To format table columns, you can use `mlreportgen.dom.TableColSpecGroup` objects, either alone or with `mlreportgen.dom.TableColSpecGroup` objects. Use a `TableColSpecGroup` object to specify the format of a group of adjacent table columns. Use a `TableColSpec` object to override, for some table columns, some or all the formats of a column group. In this example, the `TableColSpecGroup` property specifies a column width of 0.2 inches and green text. The `TableColSpec` overrides those formats for the first column, specifying a width of 0.5 inches and bold, red text.

```
import mlreportgen.dom.*
rpt = Document('test');

rank = 5;
```

```
table = Table(magic(rank));
table.Border = 'single';
table.BorderWidth = '1px';

grps(1) = TableColSpecGroup;
grps(1).Span = rank;
grps(1).Style = {Width('0.2in'),Color('green')};

specs(1) = TableColSpec;
specs(1).Span = 1;
specs(1).Style = {Width('0.5in'),Bold,Color('red')};

grps(1).ColSpecs = specs;

table.ColSpecGroups = grps;
append(rpt,table);

close(rpt);
rptview(rpt.OutputPath);
```

To resize columns to fit the widest content of the table entries in a column, include a `ResizeToFitContents` object in the `Style` property of the table.

Create and Format Table Entries

If you need to build a table from scratch, you can use the `mlreportgen.dom.TableEntry` constructor to create table entries. You can then format the table entries and add them to table rows, which you can then add to the table you are building. If you need to format entries in a table that you have created from a cell array, you can use the `TableEntry` or `TableRow` function `entry` to gain access to an entry, which you can then format.

Create a Table Entry

Use a `TableEntry` constructor to create a table entry. You can optionally use the constructor to specify these kinds of entry content:

- Char array
- Any of these kinds of DOM objects:
  - `Paragraph`
  - `Text`

- `Image`
- `Table`
- `OrderedList`
- `UnorderedList`
- `CustomElement`

Format Table Entries Programmatically

You can use format objects or `TableEntry` format properties to format a table entry programmatically.

Formatting	Format Object	Format Property
Create border around entry	`Border`	`Border`
Color of border	`Border`	`BorderColor`
Thickness of border	`Border`	`BorderWidth`
Create left, right, top, or bottom entry border	`Border`	n/a
Align entry content top, bottom, middle	`VAlign`	`VAlign`
Space between entry boundary and entry content	`InnerMargin`	`InnerMargin`
Space between entry content and its top, bottom, right, or left boundaries	`InnerMargin`	n/a
Cause entry to span multiple columns	`ColSpan`	`ColSpan`
Cause entry to span multiple rows	`RowSpan`	`RowSpan`

You can specify formatting for all table entries in a table, use the `TableEntriesStyle` property of the `Table` or `FormalTable` object. For example, you can set border formatting.

```
import mlreportgen.dom.*
t = Table(magic(5));
t.TableEntriesStyle(Border('solid','black','1 px'));
```

Properties you set for a `TableEntry` object take precedence over `TableEntriesStyle` format objects.

Format Table Entries Using Style Sheets

For HTML reports, you can use styles defined in an HTML template style sheet to format table entries. When defining a table entry style, use a `td` element selector. For example:

```
td.TableEntryWithBorder {
  border:5px solid red;
}
```

To apply a template-defined style to a table entry, set the `TableEntry` object `StyleName` property to the name of the style or specify the style name as the second argument to the `TableEntry` constructor. For example:

```
te = TableEntry('Hello World','TableEntryWithBorder');
```

See Also

Classes
mlreportgen.dom.AllowBreakAcrossPages | mlreportgen.dom.ColSep | mlreportgen.dom.FlowDirection | mlreportgen.dom.FormalTable | mlreportgen.dom.RepeatAsHeaderRow | mlreportgen.dom.ResizeToFitContents | mlreportgen.dom.RowHeight | mlreportgen.dom.RowSep | mlreportgen.dom.Table | mlreportgen.dom.TableBody | mlreportgen.dom.TableColSpec | mlreportgen.dom.TableColSpecGroup | mlreportgen.dom.TableEntry | mlreportgen.dom.TableFooter | mlreportgen.dom.TableHeader | mlreportgen.dom.TableHeaderEntry | mlreportgen.dom.TableRow

Functions
mlreportgen.dom.FormalTable.appendFooterRow | mlreportgen.dom.FormalTable.appendHeaderRow | mlreportgen.dom.TableRow.append

Related Examples

- “Add Content to a Report” on page 11-11

More About

- “Report Formatting Approaches” on page 11-21

Create Links

In this section...

You can add these kinds of links to a report:

- External — Link to a location outside of the report, such as an HTML page or a PDF file. Use an `mlreportgen.dom.ExternalLink` object.
- Internal — Link to locations in the report. Use an `mlreportgen.dom.InternalLink` object.

Create a Link Target

To specify the link target for an `InternalLink` object, use the value in the `Name` property of an `mlreportgen.dom.LinkTarget` object. When you construct an `ExternalLink` object, you can use a `LinkTarget` object `Name` value or a URL.

This example creates a link target called `home`, and uses `home` as the target for an internal link.

```
import mlreportgen.dom.*
d = Document('mydoc');

append(d,LinkTarget('home'));
append(d,InternalLink('home','Go to Top'));

close(d);
rptview(d.OutputPath);
```

Create an External Link

Use an `mlreportgen.dom.ExternalLink` object to create an external link, specifying the link target and the link text.

```
import mlreportgen.dom.*
d = Document('mydoc');

append(d,ExternalLink('http://www.mathworks.com/','MathWorks'));

close(d);
rptview('mydoc','html');
```

Create an Internal Link

To set up links to a location in a report, append an `mlreportgen.dom.InternalLink` object to the document or document element. Use an `mlreportgen.dom.LinkTarget` object with the document element to link to. For example, you can include an `About the Author` link to a section that has the heading `Author's Biography`.

```
import mlreportgen.dom.*
d = Document('mydoc');

append(d,InternalLink('bio','About the Author'));
h = Heading(1,LinkTarget('bio'));
append(h,'Author''s Biography');
append(d,h);

close(d);
rptview('mydoc','html');
```

Add Text or Images to Links

To add text or an image to an `ExternalLink` or `InternalLink` object, use the `append` method with that object. Append a `Text`, `Image`, or `CustomElement` object.

Create a Page Reference

You can create a numeric reference to the page where a link target resides. For example, you can create a page reference in the form “See page 15,” where the target you are referencing is on an object on page 15. For example:

```
import mlreportgen.dom.*;
d = Document('mydoc','pdf');
open(d);
```

```
% Add target to heading object and append heading and para text to document
h = Heading1(LinkTarget('mytarget'));
append(h,'Referenced Head');
p = Paragraph('Here is some paragraph text.');
append(d,h);
append(d,p);

% Add another page and insert the page reference to the target
p1 = Paragraph('The following paragraph contains the page reference.');
p1.Style = {PageBreakBefore(true)};
p2 = Paragraph('See Page ');
p2.WhiteSpace = 'preserve';
ref = PageRef('mytarget');
append(p2,ref);
append(p2,'.');
append(d,p1);
append(d,p2);

close(d);
rptview(d.OutputPath);
```

In your PDF template, you can use a `<pageref>` element to create this kind of reference. Your DOM API program must set the link target that the element uses. The `<pageref>` uses one argument: `<pageref target="nameoftarget>`.

For more information on this mechanism, see mlreportgen.dom.PageRef.

See Also

mlreportgen.dom.ExternalLink | mlreportgen.dom.ExternalLink.append | mlreportgen.dom.InternalLink | mlreportgen.dom.LinkTarget | mlreportgen.dom.PageRef

Related Examples

- "Create Image Maps" on page 11-96
- "Add Content to a Report" on page 11-11

More About

- "Report Formatting Approaches" on page 11-21

Create and Format Images

In this section...

Create an Image

To create an image to a report, create an `mlreportgen.dom.Image` object. You can append it to one of these document element objects:

- `Document`
- `Group`
- `Paragraph`
- `ListItem`
- `TableEntry`

For example, you can create a MATLAB figure, save it as an image, and add the image to a report.

```
import mlreportgen.dom.*
d = Document('imageArea','html');

p = Paragraph('Plot 1');
p.Bold = true;
append(d,p);

x = 0:pi/100:2*pi;
y = sin(x);
plot(x,y);

saveas(gcf,'myPlot_img.png');

plot1 = Image('myPlot_img.png');
append(d,plot1);
```

```
close(d);
rptview(d.OutputPath);
```

For a list of supported image formats, see mlreportgen.dom.Image.

Resize an Image

To resize an image object, you can:

- Set the `Image.Height` and `Image.Width` properties.
- Use an `mlreportgen.dom.Height` or `mlreportgen.dom.Width` object in an `Image.Style` property definition.

For Microsoft Word and PDF reports, you can use an mlreportgen.dom.ScaleToFit object to scale an image so that it fits within the page margins or in a table entry that contains it.

Image Storage

Keep the original file until it has been copied into the document. The DOM API copies the contents of the source image file into the output document when you close the document.

Links from an Image

You can specify an area in an image as a link. Clicking a link area in an image in an HTML browser opens the link. For details, see “Create Image Maps” on page 11-96.

See Also

mlreportgen.dom.Height | mlreportgen.dom.Image | mlreportgen.dom.ScaleToFit | mlreportgen.dom.Width

Related Examples

- “Add Content to a Report” on page 11-11

More About

- “Report Formatting Approaches” on page 11-21

Create a Table of Contents

You can create a table of contents in your report program or you can use a template to define the TOC. To create the TOC programmatically, append an mlreportgen.dom.TOC object to your report document.

Using a template ensures that all report programs that use that template create the same type of TOC. Also, with a template, you update the TOC in only one place if your formatting changes.

If you are using a template, you can either:

- Include the TOC reference in your Word template or in your HTML or PDF template package (`root.html`).
- Create a document part template for the TOC and insert the document part programmatically.

Using either approach, your report program must create heading objects that specify a numeric level or paragraph objects that specify outline level. The TOC generator uses content with level information to define the structure.

Create a TOC in Your Report Program

The DOM API supports automatic generation of a document's table of contents. To enable automatic TOC generation:

- Use `Paragraph` or heading objects (`Heading`, `Heading1`, and so on) in your document to specify section headings. If you use a `Paragraph` object for a heading, you must set the paragraph's `OutlineLevel` property to an appropriate value, for example, 1 for a chapter or other top-level heading.
- Insert a TOC placeholder in your document where you want to generate the TOC. You can insert a TOC placeholder programmatically or in the template for your document.

Create a TOC Programmatically

To create a TOC placeholder programmatically, append an `mlreportgen.dom.TOC` object where you want to generate the TOC. You can specify the number of levels to include in the TOC and the type of leader. The default values are three levels and a dot leader. This example uses two levels and a dot leader.

```
import mlreportgen.dom.*;
d = Document('mydoc','pdf');
```

```
open(d);

title = append(d,Paragraph('My TOC Document'));
title.Bold = true;
title.FontSize = '28pt';

toc = append(d,TOC(2));
toc.Style = {PageBreakBefore(true)};

h1 = append(d,Heading1('Chapter 1'));
h1.Style = {PageBreakBefore(true)};
p1 = append(d,Paragraph('Hello World'));

h2 = append(d,Heading2('Section 1.1'));
h2.Style = {PageBreakBefore(true)};
p2 = append(d,Paragraph('Another page'));

h3 = append(d,Heading3('My Subsection 1.1.a'));
p3 = append(d, Paragraph('My Level 3 Heading Text'));

close(d);
rptview(d.OutputPath);
```

Use a Template to Create a Microsoft Word TOC

You can use Word to insert a Word TOC reference object in a Word document or document part template. Word replaces the TOC reference with an automatically generated TOC when it updates the document.

To generate a table of contents in a DOM Word report using a template containing a TOC reference:

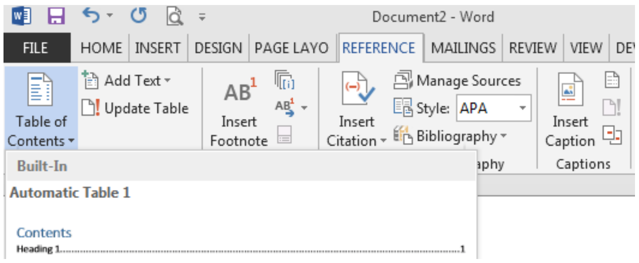
1. To specify where in the report to generate the TOC, create a table of contents reference in the Word template. See “Create a Word Table of Contents Reference” on page 11-89.
2. Set the outline levels of the section heads that you want to appear in the table of contents. See “Set Outline Levels of Section Heads” on page 11-93.
3. Update the generated document. See “Update the TOC in a Word Report” on page 11-91.

Create a Word Table of Contents Reference

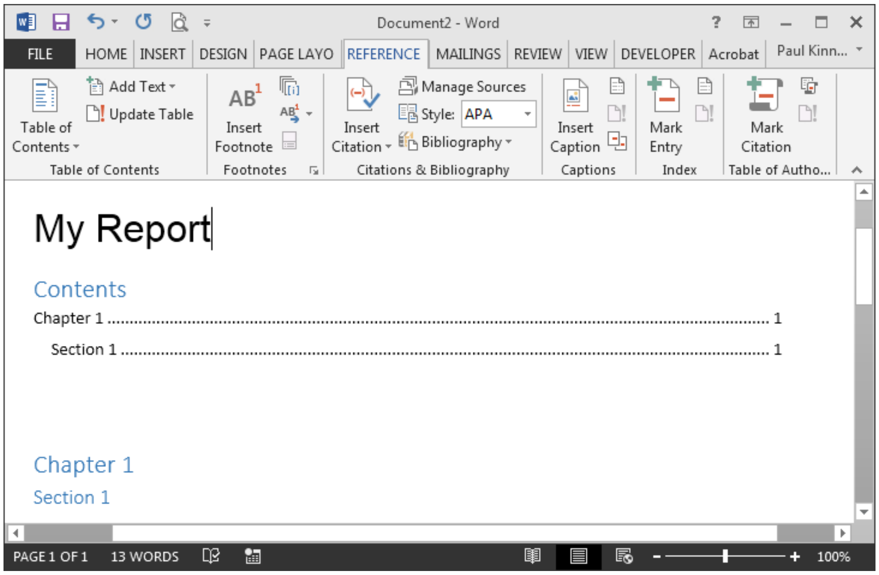
1. Open the template in Word.

2 Click where you want to create the table of contents.

3 On the **References** tab, click **Table of Contents**.



4 Select a TOC format option to generate a table of contents. For example, select the **Built-In** format option. The TOC appears.



My Report

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Section 1 1

Chapter 1

Section 1

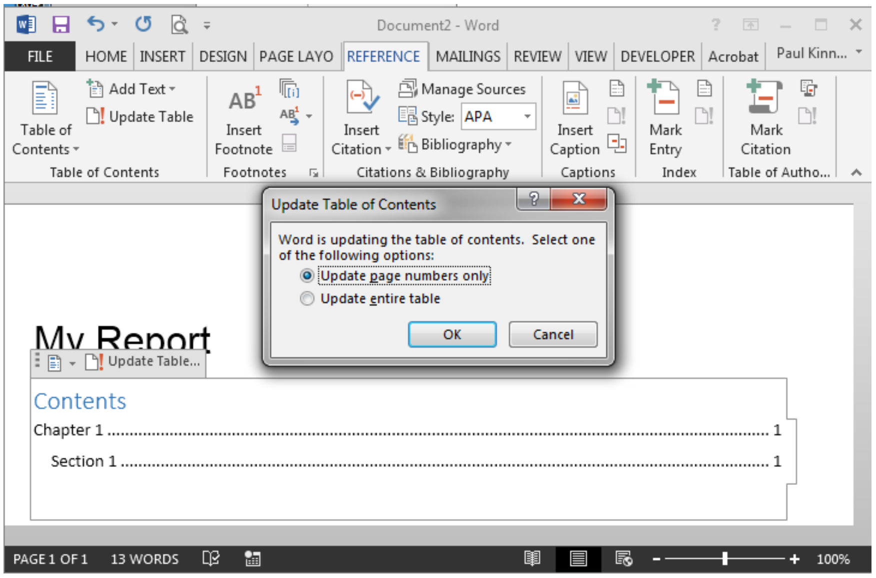
5 Save the template.

Note: If you want to use a document part to insert a TOC, insert the TOC reference in the template for the document part. Delete the instance from the template before you save. See “Create a Microsoft Word Document Part Template Library” on page 11-37 and “Insert TOC Placeholder Programmatically Using a Document Part” on page 11-92.

Update the TOC in a Word Report

You must update a Word document containing a TOC reference to generate a TOC. On Windows systems, the DOM API `rptview` command uses Word to update the Word document that it displays. If you open a Word document directly, for example, a document generated by the DOM API on system other than Windows, you must update the TOC.

1 In the Word template, select the TOC reference.
2 On the **References** tab, click **Update Table**.
3 In the Update Table of Contents dialog box, select **Update entire table** and click **OK**.


Update Table of Contents

Word is updating the table of contents. Select one of the following options:

(●) Update page numbers only
( ) Update entire table

OK | Cancel

My Report

Contents
Chapter 1 1
Section 1 1

Create Table of Contents in HTML or PDF Templates

When you use a PDF or HTML template to add a TOC, you can:

- Include a table of contents placeholder in the main template (`root.html`) in your template package.
- Include the TOC placeholder in a document part template.

To create a table of contents in an HTML or PDF report using a document part template:

- Define a document part template that includes the TOC placeholder.
- Programmatically insert the document part into your report.
- Use `Paragraph` or heading objects (`Heading`, `Heading1`, and so on) to specify your report's headings. If you use a `Paragraph` object for a heading, you must set its `OutlineLevel` property to an appropriate value.

Define a Document Part Template for TOC

To create or modify a document part template for a TOC, use code in this form:

```
<dptemplate name="ReportTOC">
     <TOC number-of-levels ="3" leader-pattern="dots" />
</dptemplate>
```

You can:

- Replace `ReportTOC` with the name you prefer
- Set `number-of-levels` to the number of levels of headings you want to include in the TOC
- Set `leader-pattern` to `dots` or to `spaces`

For an example, see "PDF and HTML Document Parts and Holes" on page 11-139.

Insert TOC Placeholder Programmatically Using a Document Part

Use the `DocumentPart` class to insert an instance of the document part that contains the TOC placeholder. If you define the document part template in your template, include the template package name when you define the document object. For example:

```
d = Document('MyReport','html','MyTemplate');
```

This code uses the supplied document part `ReportTOC` in the default template to generate a table of contents.

```
import mlreportgen.dom.*;
d = Document('MyReport','pdf');
append(d,'My Report');

append(d,DocumentPart(d,'ReportTOC'));
append(d,Heading1('Chapter 1'));
append(d,Heading2('Section 1'));

close(d);
rptview(d.OutputPath);
```

Tip Use the variable assigned to the `Document` object in the `DocumentPart` syntax to uses the document part template associated with the document object:

```
append(d,DocumentPart(d,'ReportTOC'));
```

If you use this syntax, you do not need to call the template and specify the document type when you refer to the document part. This approach simplifies your code and generates the report more efficiently.

Set Outline Levels of Section Heads

To generate a table of contents in your report, your program must set the outline levels of the section heads that you want in the contents. An outline level is a paragraph format property that specifies whether and at what level a paragraph's contents appear in a table of contents. For example, if a paragraph has an outline level of 1, the content appears at the top level of the generated table of contents. You can specify up to nine outline levels.

To set the outline level of paragraphs, use one of these approaches.

- "Use Template-Defined Styles to Set Outline Levels" on page 11-93
- "Use Format Objects to Set Outline Levels" on page 11-94
- "Use Heading Objects to Set Outline Levels" on page 11-94

Use Template-Defined Styles to Set Outline Levels

You can use styles defined in the report's template to set the outline level of a paragraph. By default Word documents include a set of styles, `Heading 1`, `Heading 2`, and so on, that define outline levels. Your program can use these built-in styles to specify for these heads to appear in the TOC. This example uses template-defined styles to set the outline levels of section heads and assumes that the template `MyTemplate` includes a TOC reference.

```
import mlreportgen.dom.*;
d = Document('MyReport','docx','MyTemplate');
```

```
append(d,Paragraph('Chapter 1','Heading 1'));
append(d,Paragraph('Section 1','Heading 2'));

close(d);
rptview(d.OutputPath); % Updates the TOC
```

You can also use Word or an HTML editor to define your own heading styles and then use them to generate a report.

Use Format Objects to Set Outline Levels

You can use format objects to set outline levels. This example assumes that the template `MyTemplate` includes a TOC reference.

```
import mlreportgen.dom.*;
d = Document('MyReport','docx','MyTemplate');

h1 = {FontFamily('Arial'),FontSize('16pt'),OutlineLevel(1)};
h2 = {FontFamily('Arial'),FontSize('14pt'),OutlineLevel(2)};
p = append(d,Paragraph('Chapter 1'));
p.Style = h1;
p = append(d,Paragraph('Section 1'));
p.Style = h2;

close(d);
rptview(d.OutputPath); % Updates the TOC
```

Use Heading Objects to Set Outline Levels

You can use `mlreportgen.dom.Heading1` object (and `Heading2`, `Heading3`, and so on) to specify outline levels. A `Heading1` object is a paragraph whose constructor specifies its outline level. You can use a `Heading1` object alone or with template-based styles or format-object-based styles. This example assumes that the template `MyTemplate` includes a TOC reference.

```
import mlreportgen.dom.*;
d = Document('MyReport','docx','MyTemplate');

h1 = {FontFamily('Arial'),FontSize('16pt')};
h2 = {FontFamily('Arial'),FontSize('14pt')};
h = append(d,Heading1('Chapter 1'));
h.Style = h1;
h = append(d,Heading2('Section 1'));
```

```
p.Style = h2;

close(d);
rptview(d.OutputPath); % Updates the TOC
```

In HTML and PDF reports, the `Heading1` and `Heading2` objects generate the HTML elements `h1` and `h2`. By using the objects `Heading1`, `Heading2`, and so on, you can ensure that your report uses the default styles for headings.

See Also

Functions
`rptview` | `unzipTemplate` | `zipTemplate`

Classes
mlreportgen.dom.Heading | mlreportgen.dom.Heading1

Related Examples

- “Create a Microsoft Word Template” on page 11-124
- “Create an HTML or PDF Template” on page 11-135

Create Image Maps

In an HTML report, you can specify areas of an image as links. Clicking the link area in an image in an HTML browser opens the target. You can map different areas in an image to different link targets.

1. Create an `mlreportgen.dom.ImageArea` object for each image area that is to serve as a link. You can specify text to display if the image is not visible.

   You can specify an image area to have one of these shapes:

   - Rectangle
   - Circle
   - Polygon

   For details, see mlreportgen.dom.ImageArea.
2. Create an `mlreportgen.dom.ImageMap` object to associate the link areas with the image. Append the `ImageArea` objects to the `ImageMap` object.

For example, you can create a link from a plot image to documentation about plotting.

```
import mlreportgen.dom.*
d = Document('imageArea','html');

x = 0:pi/100:2*pi;
y = sin(x);
plot(x,y);
annotation('textbox',[0.2,0.4,0.1,0.1],...
           'String','Help for plot function');
saveas(gcf,'plot_img.png');

plot1 = Image('plot_img.png');
append(d,plot1);

area1 = ImageArea(...
    ['http://www.mathworks.com/help/matlab/ref/' ...
    'plot.html?searchHighlight=plot'], ...
    'plot function help',240,450,463,492);

map = ImageMap();
plot1.Map = map;
append(map,area1);
```

```
close(d);
rptview(d.OutputPath);
```

See Also

Classes

mlreportgen.dom.Image | mlreportgen.dom.ImageArea | mlreportgen.dom.ImageMap

Functions

Related Examples

- “Add Content to a Report” on page 11-11

More About

- “Report Formatting Approaches” on page 11-21

Automatically Number Document Content

In this section...
"Automatically Number Content Programmatically" on page 11-98
"Automatically Number Content Using Part Templates" on page 11-100

You can automatically number document content, such as chapter, section, table, and figure headings. Append automatic numbering objects to the document where you want numbers to appear. Each automatic number is associated with a numbering stream that determines the value of each number in a sequence. Report generation replaces an automatic numbering object with a number based on its position in the document relative to other automatic numbers in the same stream. For example, the first automatic numbering object in a stream is replaced with 1, the second with 2, and so on. You can use automatic numbering to create hierarchical numbering schemes such as Section 1.1 and Section 1.2.

You can automatically number document content programmatically or by defining the autonumbers in a template.

Automatically Number Content Programmatically

To automatically number document content programmatically, do the following at each point in a document where you want an automatically generated number to appear.

1 Create an automatic numbering object, using the `mlreportgen.dom.AutoNumber` constructor. Specify the name of the associated automatic numbering stream in the constructor. For example, this line creates an automatic number belonging to the stream named `chapter`.

```
chapterNumber = AutoNumber('chapter');
```

Note: If the specified automatic numbering stream does not exist, the `AutoNumber` constructor creates a numbering stream having the specified name. The implicitly constructed stream renders automatic numbers as Arabic numerals. To use a stream with different properties, create the stream explicitly, using a `createAutoNumberStream` function of a `Document` object.

2 Append the `AutoNumber` to a `Text`, `Paragraph`, or `Heading` object that contains the text that precedes the automatic number.

```
append(chapHead,chapterNumber);
```

3 Append an `mlreportgen.dom.CounterInc` format object to the `Style` property of the content object that you want to automatically number. Appending a `CounterInc` object increments the stream associated with the automatic number when the paragraph or heading is output. The updated value replaces the `AutoNumber` object.

```
chapHead.Style = {CounterInc('chapter'), WhiteSpace('preserve')};
```

This code automatically numbers the chapter headings in a document.

```
import mlreportgen.dom.*;
d = Document('MyReport','html');

for rank = 3:5
    chapHead = Heading1('Chapter ','Heading 1');
    append(chapHead,AutoNumber('chapter'));
    append(chapHead,sprintf('. Rank %i Magic Square',rank));
    chapHead.Style = {CounterInc('chapter'), ...
                      WhiteSpace('preserve')};
    append(d,chapHead);
    table = append(d,magic(rank));
    table.Width = '2in';
end

close(d);
rptview(d.OutputPath);
```

Create Hierarchical Automatic Numbering

You can create hierarchical numbering schemes, such as 1.1, 1.2, 1.3, 2.1, and 2.2. Use an `mlreportgen.dom.CounterReset` format object to reset a child automatic number to its initial value when its parent number changes. For example, this code uses a `CounterReset` format object to reset the chapter table number stream at the beginning of each chapter.

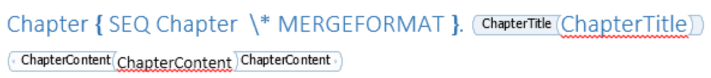
```
import mlreportgen.dom.*;
d = Document('MyReport','html');

for rank = 3:2:9
    chapHead = Heading(1,'Chapter ');
    append(chapHead, AutoNumber('chapter'));
    chapHead.Style = {CounterInc('chapter'), ...
                      CounterReset('table'), ...
                      WhiteSpace('preserve')};
    append(d,chapHead);

    for i = 0:1;
        tableHead = Paragraph('Table ');
        append(tableHead,AutoNumber('chapter'))
        append(tableHead,'.');
        append(tableHead, AutoNumber('table'));
        append(tableHead, ...
           sprintf('. Rank %i Magic Square',rank+i));
        tableHead.Style = {CounterInc('table'), ...
                           Bold, ...
                           FontSize('11pt'), ...
                           WhiteSpace('preserve')};
        append(d,tableHead);
        table = append(d,magic(rank+i));
        table.Width = '2in';
    end
end

close(d);
rptview(d.OutputPath);
```

Automatically Number Content Using Part Templates

You can automatically number a document by creating a document part object based on templates containing Microsoft Word, HTML, or PDF automatic numbering and repeatedly appending the parts to a document.

Automatic Numbering in Word Reports

Suppose that you add a chapter part template `Chapter` to the part template library of the Word `MyReportTemplate.dotx` report template. This template uses a Word sequence (`SEQ`) field to number the chapter heading. The template also contains holes for the chapter title and the chapter content.



Chapter { SEQ Chapter * MERGEFORMAT }. ChapterTitle ChapterTitle

ChapterContent ChapterContent ChapterContent

This code uses the chapter part template to create numbered chapters. The last statement in this code opens the report in Word and updates it. Updating the report causes Word to replace the `SEQ` fields with the chapter numbers.

```
import mlreportgen.dom.*
doctype = 'docx';
d = Document('MyReport',doctype,'MyReportTemplate');

for rank = 3:5
    chapterPart = DocumentPart(d,'Chapter');
    while ~strcmp(chapterPart.CurrentHoleId,'#end#')
       switch chapterPart.CurrentHoleId
           case 'ChapterTitle'
              append(chapterPart, ...
                 sprintf('Rank %i Magic Square',rank));
           case 'ChapterContent'
              table = append(chapterPart,magic(rank));
              table.Width = '2in';
       end
       moveToNextHole(chapterPart);
    end
    append(d, chapterPart);
end

close(d);
rptview(d.OutputPath);
```

Automatic Numbering in HTML Reports

To create automatic numbering in HTML reports, create a document part that uses the `counter-increment` property, and define the counter in the style sheet. For example, to create a document part to work with the same program used in “Automatic Numbering in Word Reports” on page 11-100, create a document part template in your HTML document library similar to this code. The code defines the `chapter` counter and specifies a class `an_chapter` to hold the autonumber. It also defines holes for the title and for the content to work with the program.

```
<dptemplate name="Chapter">
      <p style="counter-increment:chapter;"><span>Chapter </span>
           <span class="an_chapter"></span>
      <hole id="ChapterTitle" /></p>
      <hole id="ChapterContent" />
 </dptemplate>
```

In the style sheet, define the `an_chapter` class. Use the `content` property to specify the `chapter` counter as the content.

```
span.an_chapter:before {
```

```
content: counter(chapter);
}
```

Use the same program as you used for Word, changing the value for `doctype` to `'html'`.

Automatic Number in PDF Reports

Creating automatic numbers for PDF is similar to HTML, except the DOM API provides an HTML element `<autonumber>` for PDF templates that simplifies automatic numbering. Specify the `stream-name` attribute for the `autonumber` element. For the stream name, use the value of a `counter-increment` property, in this case `chapter`.

```
<dptemplate name="Chapter">
    <p style="counter-increment:chapter;"><span>Chapter </span>
          <autonumber stream-name="chapter"/>
       <hole id="ChapterTitle" /></p>
       <hole id="ChapterContent" />
 </dptemplate>
```

You do not need to add properties in the style sheet to use the autonumber.

Use the same program you used for Word, changing the value for `doctype` to `'pdf'`.

See Also

Functions
mlreportgen.dom.Document.createAutoNumberStream

Classes
mlreportgen.dom.AutoNumber | mlreportgen.dom.AutoNumberStream | mlreportgen.dom.CounterInc | mlreportgen.dom.CounterReset

Appending HTML to DOM Reports

You can append HTML markup or the entire contents of an HTML file to a programmatic report written with the DOM API. Append HTML to:

- Convert an existing HTML report to a Microsoft Word or PDF report.

  You can append HTML markup for a report to a DOM report, which you can then generate in Word or PDF format.
- Add content based on HTML markup.

  You can append the HTML content to a DOM report. You can use the HTML content as a building block in a DOM report that includes other report elements.

Workflow for Appending HTML

Appending HTML to a DOM report involves these tasks.

1. In a DOM report, append HTML content or an HTML file to a document or document part.

   For example, this DOM code creates a Word report that displays `Hello World`, based on the HTML content that you append to the report.

   ```
   import mlreportgen.com.*;
   d = Document('MyReport','docx');
   addHTML(d,'<p style="color:blue"><b>Hello World</b></p>');
   ```

   An alternative approach is to create an `mlreportgen.dom.HTML` or `mlreportgen.dom.HTMLFile` object and append it to a DOM report.
2. If you receive any MATLAB error messages, fix the source HTML markup and append the HTML again.

   The HTML content that you append must be XML parsable. For a summary of those requirements and for a list of supported HTML elements and HTML CSS formats, see “HTML Code Requirements for DOM Reports” on page 11-113.

See Also

mlreportgen.dom.Document.addHTML | mlreportgen.dom.Document.addHTMLFile | mlreportgen.dom.HTML | mlreportgen.dom.HTMLFile

Related Examples

- “Append HTML Content to DOM Reports” on page 11-105
- “Append HTML File Contents to DOM Reports” on page 11-107
- “Use an HTML Cleanup Program” on page 11-109

More About

- “HTML Code Requirements for DOM Reports” on page 11-113

Append HTML Content to DOM Reports

In this section...

You can append strings of HTML content to a DOM document or document part using either of these approaches:

- Use the `addHTML` method with a `Document` or `DocumentPart` object.
- Create and append an `HTML` object.

If the HTML content that you append does not meet DOM requirements, the DOM API generates error messages. You can use an HTML cleanup program such as HTML Tidy on a file containing the source HTML content. HTML Tidy fixes many issues and also identifies issues you need to address manually. After you clean up the source HTML content, append it to a DOM report.

Use an addHTML Method

You can use the `addHTML` method with an `mlreportgen.dom.Document` or `mlreportgen.dom.DocumentPart` object to add a string of HTML content to a DOM report.

For example, you can use `addHTML` to create an `HTML` object that you append to a DOM report that produces Word output.

```
import mlreportgen.dom.*;
rpt = Document('HTMLToWordReport','docx');
htmlObj = addHTML(rpt,...
    '<p><b>Hello</b> <i style="color:green">World</i></p>');

close(rpt);
rptview(rpt.OutputPath);
```

Append an HTML Object

You can create an `mlreportgen.dom.HTML` object and append it to a DOM report. To append the content of an `HTML` object more than once in a report, use the `clone` method with the `HTML` object. Then append the cloned copy to the report.

For example, you can create an `HTML` object from HTML markup to use for a Word report.

```
import mlreportgen.dom.*;
rpt = Document('MyRep1','docx');
html = HTML('<p><b>Hello</b> <i style="color:green">World</i></p>');

append(html,'<p>This is <u>me</u> speaking</p>');
append(rpt,html);

close(rpt);
rptview(rpt.OutputPath);
```

Address Errors

If you receive any MATLAB error messages, fix the source HTML markup and append the HTML again. You can use an HTML cleanup program such as HTML Tidy on a file containing the source HTML content. HTML Tidy fixes many issues and also identifies issues you need to address manually. After you clean up the source HTML content, append it to a DOM report. For details, see “Use an HTML Cleanup Program” on page 11-109.

See Also

mlreportgen.dom.Document.addHTML | mlreportgen.dom.HTML

Related Examples

- “Append HTML File Contents to DOM Reports” on page 11-107
- “Use an HTML Cleanup Program” on page 11-109

More About

- “Appending HTML to DOM Reports” on page 11-103
- “HTML Code Requirements for DOM Reports” on page 11-113

Append HTML File Contents to DOM Reports

In this section...

You can append HTML files to a DOM document or document part using either of these approaches:

- Use the `addHTMLFile` method with a `Document` or `DocumentPart` object.
- Create and append an `HTMLFile` object.

If the HTML file contents that you append do not meet DOM requirements, the DOM API generates error messages. You can use an HTML parser and cleanup program such as HTML Tidy to fix many issues and to identify issues you need to address manually.

Use an addHTMLFile Method

You can use the `addHTMLFile` method with an `mlreportgen.dom.Document` or `mlreportgen.dom.DocumentPart` object to add the contents of an HTML file to a DOM report.

For example, you can use `addHTMLFile` to create an `HTMLFile` object that you append to a DOM report that produces Word output.

```
import mlreportgen.dom.*;
rpt = Document('HTMLToWordReport','docx');
htmlObj = addHTML(rpt,...
    '<p><b>Hello</b> <i style="color:green">World</i></p>');

close(rpt);
rptview(rpt.OutputPath);
```

Append an HTMLFile Object

You can create an `mlreportgen.dom.HTMLFile` object and append it to a DOM report.

For example, you can convert the contents of two HTML files to a DOM report in Word format. This example assumes that there are HTML files called `myHTMLfile1.html` and `myHTMLfile2.html` in the current MATLAB folder.

```
import mlreportgen.dom.*;
rpt = Document('MyHTMLReport','docx');

path = 'myHTMLfile1.html';
htmlFile1 = HTMLFile(path);

htmlFile2 = HTMLFile('myHTMLFile2.html');
append(htmlFile1,htmlFile2)
append(rpt,htmlFile1);

close(rpt);
rptview(rpt.OutputPath);
```

Address Errors

If you receive any MATLAB error messages, fix the source HTML markup and append the HTML again. You can use an HTML cleanup program such as HTML Tidy on the HTML file to fix many issues. HTML Tidy also identifies issues you need to address manually. After you clean up the HTML content, append it to a DOM report. For details, see “Use an HTML Cleanup Program” on page 11-109.

See Also

mlreportgen.dom.Document.addHTMLFile | mlreportgen.dom.HTMLFile

Related Examples

- “Append HTML Content to DOM Reports” on page 11-105
- “Use an HTML Cleanup Program” on page 11-109

More About

- “Appending HTML to DOM Reports” on page 11-103
- “HTML Code Requirements for DOM Reports” on page 11-113

Use an HTML Cleanup Program

You can use an HTML cleanup program such as HTML Tidy to fix many issues and to identify issues you need to address manually. For a description of requirements for HTML content that you can append, see "HTML Code Requirements for DOM Reports" on page 11-113 .

Use HTML Tidy to Fix HTML Code

You can use the HTML Tidy program to fix HTML content so that it meets the requirements for appending to a DOM report. This example uses a batch file to fix the HTML content.

1 Copy this HTML content into a text editor such as WordPad.

```
<html>
<head>
  <title>Hi there</title>
</head>
<body>
  <p>This is a page
  a simple page with a simple table
<style>
table, th, td {
    border: 1px solid black;
}
</style>
<table style="width:50%">
  <tr>
    <td><b>Name</B></td>
    <td><b>Age</b></td>
    <td><b>Occupation</b></td>
  </tr>
  <tr>
    <td>Joe Smith</td>
    <td>40</td>
    <td>Plumber</td>
  </tr><tr>
    <td>Sue Jones</td>
    <td>33</td>
    <td>Scientist</td>
  </tr>
<tr>
```

```
    <td>Carlos Martinez</td>
    <td>38</td>
    <td>Lawyer</td>
  </tr>

</table>
  </body>
</html>
```

This HTML content has elements that are not XML parsable, including:

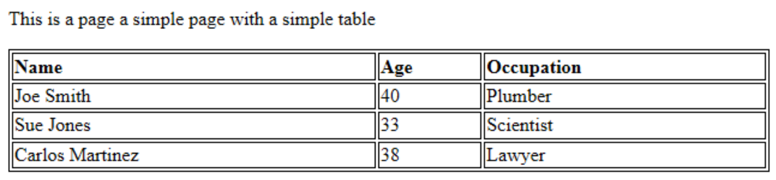
- Lack of a closing tag:

  ```
  <p>This is a page
    a simple page with a simple table
  ```

- Inconsistent case for an element tag:

  ```
  <td><b>Name</B></td>
  ```

2. In the current MATLAB folder, save the file using the file name `simple_html_example.html`.
3. Display the file in an HTML browser. Although the HTML content contains elements that are not XML parsable, it displays properly in most HTML browsers, such as Internet Explorer.



This is a page a simple page with a simple table

Name	**Age**	**Occupation**
Joe Smith	40	Plumber
Sue Jones	33	Scientist
Carlos Martinez	38	Lawyer

4. In MATLAB, try appending the HTML file to a DOM report.

   ```
   import mlreportgen.dom.*;
   rpt = Document('html_report','docx');
   htmlFile = HTMLFile('simple_html_example.html');
   ```

   You receive this error.

   ```
   Error using mlreportgen.dom.HTMLFile
   ```

```
Parsing HTML text:
 "simple_html_example.html"
 caused error:
 "HTML error: "expected end of tag 'b'""
```

5. Download the HTML Tidy program. For example, to download Tidy for Windows, go to http://www.paehl.com/open_source/?HTML_Tidy_for_Windows. Click the `EXE Version compiled 06 nov 2009` link.

   Note: To download Tidy for other platforms, see http://tidy.sourceforge.net/#binaries.

6. In the `tidy.zip` file, right-click `tidy.exe` and select **Extract**. Extract `tidy.exe` to the current MATLAB folder.
7. Create a batch file to use with Tidy. In Notepad, enter the following code.

   ```
   tidy --doctype omit --input-xml no --output-xml yes --write-back yes -f errs.txt %1
   ```

   Save the batch file in the Windows path. Save the file as `tidyup.bat`. You can use this batch file with other HTML files that you want to append to a DOM report.
8. Make a backup copy of the `simple_html_example.html` file, which contains the HTML to append to the DOM report.
9. Run Tidy on `simple_html_example.html`. In a Windows command window, enter:

   ```
   tidyup simple_html_example.html
   ```
10. In the folder where you ran `tidyup`, check the `errs.txt` file. That file summarizes the changes Tidy made, and lists as errors issues that Tidy could not fix. In this example, there are no errors, but if `errs.txt` did report errors, manually edit the HTML file to address those issues.
11. In MATLAB, append the `simple_html_example.html` file to a DOM report and display the report.

    ```
    import mlreportgen.dom.*;
    rpt = Document('html_report','docx');
    htmlFile = HTMLFile('simple_html_example.html');
    append(rpt,htmlFile);

    close(rpt);
    rptview(rpt.OutputPath);
    ```

Related Examples

- “Append HTML Content to DOM Reports” on page 11-105

- “Append HTML File Contents to DOM Reports” on page 11-107

More About

- “HTML Code Requirements for DOM Reports” on page 11-113
- “Appending HTML to DOM Reports” on page 11-103

HTML Code Requirements for DOM Reports

In this section...

XML-Parsable HTML Code

The HTML content that you append to a DOM report must be XML parsable. HTML content that complies with the rules for properly formed XML, such as:

- Include a closing tag for all elements.
- Use lower case for the opening and closing (start and end) tags of an element. For example, use `<p>` and `</p>` for a paragraph element, not `<P>` and `</p>`.
- Nest elements properly. If you open an element inside another element, close that first element before you close the containing element.
- Enclose attribute values with quotation marks. For example, use `<p align="center"></p>`.

For details, see the W3Schools summary of XML rules at www.w3schools.com/xml/xml_syntax.asp.

Tip You can use the HTML Tidy program to ensure that your HTML file is XML parsable. For details, see "Use an HTML Cleanup Program" on page 11-109.

Supported HTML Elements and Attributes

In HTML content that you append to a DOM report, you can use these HTML elements and attributes.

HTML Element	Attributes
`a`	`class`, `style`, `href`, `name`

HTML Element	Attributes
b	class, style
body	class, style
br	n/a
code	class, style
del	class, style
div	class, style
font	class, style, color, face, size
h1, h2, h3, h4, h5, h6	class, style, align
hr	class, style, align
i	class, style
ins	class, style
img	class, style, src, height, width, alt
li	class, style
ol	class, style
p	class, style, align
pre	class, style
s	class, style
span	class, style
strike	class, style
sub	class, style
sup	class, style
table	class, style, align, bgcolor, border, cellspacing, cellpadding, frame, rules, width
tbody	class, style, align, valign
tfoot	class, style, align, valign
thead	class, style, align, valign

HTML Element	Attributes
td	class, style, bgcolor, height, width, colspan, rowspan, valign, nowrap
tr	class, style, bgcolor, valign
tt	class, style
u	class, style
ul	class, style

For information about these elements, see the W3Schools tags documentation at www.w3schools.com/tags.

Supported HTML CSS Style Attributes for All Elements

You can use HTML style attributes to format HTML content that you append to a DOM report. A style attribute is a string of CSS (cascading style sheets) formats.

These CSS formats are supported:

- background-color
- border
- border-bottom
- border-bottom-color
- border-bottom-style
- boder-bottom-width
- border-color
- border-left
- border-left-color
- border-left-style
- boder-left-width
- border-right
- border-right-color
- border-rigtht-style
- border-right-width

- `border-style`
- `border-top`
- `border-top-color`
- `border-top-style`
- `border-top-width`
- `border-width`
- `color`
- `counter-increment`
- `counter-reset`
- `display`
- `font-family`
- `font-size`
- `font-style`
- `font-weight`
- `height`
- `line-height`
- `list-style-type`
- `margin`
- `margin-bottom`
- `margin-left`
- `margin-right`
- `margin-top`
- `padding`
- `padding-bottom`
- `padding-left`
- `padding-right`
- `padding-top`
- `text-align`
- `text-decoration`
- `text-indent`

- `vertical-align`
- `white-space`
- `width`

For information about these formats, see the W3Schools CSS documentation at www.w3schools.com/cssref.

Support for HTML Character Entities

You can append HTML content that includes special characters, such as the British pound sign, the U.S. dollar sign, or reserved XML markup characters. The XML markup special characters are `>`, `<`, `&`, `"`, and `'`. To include special characters, use HTML named or numeric character references. For example, to include the left bracket (<) in HTML content that you want to append, use one of these character entity references:

- The named character entity reference `&lt;`
- The numeric character reference `&003c;`

For more information, see http://en.wikipedia.org/wiki/List_of_XML_and_HTML_character_entity_references.

DOCTYPE Declaration

The HTML content that you append to a DOM report does not need to include a document type declaration (see http://www.w3schools.com/tags/tag_doctype.asp). If the content includes a document type declaration, it must meet the following conditions:

- If the content includes character entity references (special characters), the document type declaration must reference a document type definition (DTD) that defines the referenced entities. For example, the following declaration specifies a DTD that defines all HTML character entities:

  ```
  <!DOCTYPE html SYSTEM "html.dtd">
  ```

  The `html.dtd` is included in the MATLAB Report Generator software.
- If the document type declaration references a DTD, a valid DTD must exist at the path specified by the declaration. Otherwise, appending the content causes a DTD parse error. For example, the following declaration causes a parse error:

  ```
  <!DOCTYPE html SYSTEM "foo.dtd">
  ```

- If the content to be appended does not include character entity references, the document type declaration does not need to reference a DTD. For example, the following declaration works for content that does not use special characters:

  ```
  <!DOCTYPE html>
  ```

Tip To avoid document type declaration issues, remove declarations from existing HTML content that you intend to append to DOM reports. If the content does not include a declaration, the DOM prepends a valid declaration that defines the entire HTML character entity set.

Related Examples

- "Use an HTML Cleanup Program" on page 11-109
- "Append HTML Content to DOM Reports" on page 11-105
- "Append HTML File Contents to DOM Reports" on page 11-107

More About

- "Appending HTML to DOM Reports" on page 11-103

Display Report Generation Messages

In this section...

Report Generation Messages

The DOM API includes a set of messages that can display when you generate a report. The messages are triggered every time a document element is created or appended during report generation.

You can define additional messages to display during report generation. The DOM API provides these classes for defining messages:

- `ProgressMessage`
- `DebugMessage`
- `WarningMessage`
- `ErrorMessage`

The DOM API provides additional classes for handling report message dispatching and display. It uses MATLAB events and listeners to dispatch messages. A message is dispatched based on event data for a specified DOM object. For an introduction to events and listeners, see "Event and Listener Concepts".

Note: When you create a message dispatcher, the DOM API keeps the dispatcher until the end of the current MATLAB session. Delete message event listeners to avoid duplicate reporting of message objects during a MATLAB session.

Display DOM Default Messages

This example shows how to display the default DOM debug messages. Use a similar approach for displaying other kinds of DOM report messages.

1. Create a message dispatcher, using the `MessageDispatcher.getTheDispatcher` method. Use the same dispatcher for all messages.

   ```
   dispatcher = MessageDispatcher.getTheDispatcher;
   dispatcher.Filter.DebugMessagesPass = true;
   ```
2. Use the `MessageDispatcher.Filter` property to specify to display debug messages.

   ```
   dispatcher.Filter.DebugMessagesPass = true;
   ```
3. Add a listener using the MATLAB `addlistener` function. Specify the dispatcher object, the source and event data, and a `disp` function that specifies the event data and format to use for the message.

   ```
   l = addlistener(dispatcher,'Message', ...
         @(src, evtdata) disp(evtdata.Message.formatAsText));
   ```
4. Include a code to delete the listener. Place it after the code that generates the report.

   ```
   delete(l);
   ```

This report displays debug messages.

```
import mlreportgen.dom.*;
d = Document('test','html');

dispatcher = MessageDispatcher.getTheDispatcher;
dispatcher.Filter.DebugMessagesPass = true;

l = addlistener(dispatcher,'Message', ...
      @(src, evtdata) disp(evtdata.Message.formatAsText));

open(d);

p = Paragraph('Chapter ');
p.Tag = 'chapter title';
p.Style = { CounterInc('chapter'),...
    CounterReset('table'),WhiteSpace('pre') };
append(p, AutoNumber('chapter'));
append(d,p);

close(d);
rptview('test','html');

delete(l);
```

Create and Display a Progress Message

This example shows how to create and dispatch a progress message. You can use a similar approach for other kinds of messages, such as warnings.

1. Create a message dispatcher.

   ```
   dispatcher = MessageDispatcher.getTheDispatcher;
   ```
2. Add a listener using the MATLAB `addlistener` function.

   ```
   l = addlistener(dispatcher,'Message', ...
         @(src, evtdata) disp(evtdata.Message.formatAsText));
   ```
3. Dispatch the message, using the `Message.dispatch` method. Specify the dispatcher object and the message to dispatch. Here the message is a debug message called `starting chapter`, and the `Document` object `d` is the source of the message.

   ```
   dispatch(dispatcher,ProgressMessage('starting chapter',d));
   ```
4. Include code to delete the listener, after the code that generates the report.

   ```
   delete(l);
   ```

This report uses this progress message.

```
import mlreportgen.dom.*;
d = Document('test','html');

dispatcher = MessageDispatcher.getTheDispatcher;

l = addlistener(dispatcher,'Message', ...
      @(src, evtdata) disp(evtdata.Message.formatAsText));

open(d);
dispatch(dispatcher,ProgressMessage('starting chapter',d));

p = Paragraph('Chapter ');
p.Tag = 'chapter title';
p.Style = { CounterInc('chapter'),...
    CounterReset('table'),WhiteSpace('pre') };
append(p, AutoNumber('chapter'));
append(d,p);

close(d);
rptview('test','html');
```

```
delete(l);
```

The MATLAB Command Window displays progress messages, including the `starting chapter` message and the messages the DOM API dispatches by default.

See Also

Functions

mlreportgen.dom.MessageDispatcher.dispatch | mlreportgen.dom.MessageDispatcher.getTheDispatcher | mlreportgen.dom.ProgressMessage.formatAsHTML | mlreportgen.dom.ProgressMessage.formatAsText | mlreportgen.dom.ProgressMessage.passesFilter

Classes

mlreportgen.dom.DebugMessage | mlreportgen.dom.ErrorMessage | mlreportgen.dom.MessageDispatcher | mlreportgen.dom.MessageEventData | mlreportgen.dom.MessageFilter | mlreportgen.dom.ProgressMessage | mlreportgen.dom.WarningMessage

Compile a Report Program

If the MATLAB Compiler™ product is installed on your system, you can use it to compile your DOM-based report generation program. Compiling allows you to share your report generation program with others who do not have MATLAB installed on their systems.

To enable someone who does not have MATLAB installed to run your compiled program, your program must execute this statement before executing the first line of DOM code that it executes to generate a report:

```
makeDOMCompilable();
```

Create a Microsoft Word Template

Use one of these approaches to create a Word template for generating a report.

- Use `mlreportgen.dom.Document.createTemplate` to create a copy of the DOM API default Word template that you can then customize. For example,

  ```
  mlreportgen.dom.Document.createTemplate('mytemplate','docx');
  ```
- Use an existing Word template (for example, a report template for your organization) and customize the template to use with the DOM API.
- Create a Word template.

Note: Word for Mac does not support creating holes for DOM API templates. If you need to create a Word template for generating Word documents on a Mac, you can:

- Create a template programmatically on the Mac, using the DOM API. See mlreportgen.dom.Template and mlreportgen.dom.TemplateHole.
- Use Word on Windows to create your template and copy the template to your Mac.

If you copy an existing template that is not based on the DOM API default Word template, apply any standard Word styles such as `Title`, `Heading 1`, `TOC 1`, `List 1`, and `Emphasis` to an element in the template. You can apply the styles to placeholder content and then remove the content. That process creates instances of the standard styles in the template style sheet.

See the Word documentation for information about how to create templates and to copy styles from one template to another.

Related Examples

- "Add Holes in a Microsoft Word Template" on page 11-125
- "Modify Styles in a Microsoft Word Template" on page 11-130
- "Create an HTML or PDF Template" on page 11-135

Add Holes in a Microsoft Word Template

In this section...

Note: Word for Mac does not support creating holes for DOM API templates. If you need to create a Word template for generating Word documents on a Mac, you can:

- Create a template programmatically on the Mac, using the DOM API. See mlreportgen.dom.Template and mlreportgen.dom.TemplateHole.
- Use Word on Windows to create your template and copy the template to your Mac.

Display the Developer Ribbon in Word

To work with holes in a Word template, use the Word **Developer** ribbon. If the **Developer** ribbon does not appear, add it.

1 In Word, select **File** > **Options**.
2 In the Word Options dialog box, select **Customize Ribbon**.
3 In the **Customize the Ribbon** list, select the **Developer** check box and click **OK**.

Tip If you do not see **Developer** check box in the list, set **Customize the Ribbon** to `Main Tabs`.

Inline and Block Holes

The DOM API supports two types of holes: inline and block.

- An inline hole is for document elements that a paragraph element can contain: `Text`, `Image`, `LinkTarget`, `ExternalLink`, `InternalLink`, `CharEntity`, and `AutoNumber`.

- A block hole can contain the same kinds of document elements as an inline hole, plus `Paragraph`, `Table`, `OrderedList`, `UnorderedList`, `DocumentPart`, and `Group` document elements.

Create an Inline Hole

1. Open the template in Word.
2. On the **Developer** ribbon, click **Design Mode**. This mode enables you to see the hole marks with the title tag after you create the hole.
3. Click in the paragraph where you want to create an inline hole.

   Tip If the hole is the only hole in a paragraph or is at the end of a paragraph:

   a. Add several blank spaces at the end of the paragraph.
   b. Insert the hole before the spaces.
   c. Delete the extra spaces.

   ---

4. Click the **Rich Text Control** button Aa. A rich text control appears at the insertion point.
5. Click the **Properties** button.
6. In the dialog box, in the **Title** field, enter an ID for the hole. In **Tag** field, enter `Hole`. Click **OK**. The hole ID appears on the rich text control.

Create a Block-Level Hole

The difference between creating a block-level hole and an inline hole is that the rich text content control must contain an empty paragraph rather than residing in a paragraph.

1. Open the Word template.
2. On the **Developer** ribbon, click **Design Mode**. This mode enables you to see the hole marks with the title tag after you create the hole.
3. Create an empty paragraph where you want to create a block-level hole. If you are at the end of a document, create a second empty paragraph.
4. Select the empty paragraph.
5. Click the **Rich Text Control** button Aa. A rich text control appears at the insertion point.

6 Click the **Properties** button.

7 In the dialog box, in the **Title** field, enter an ID for the hole. In the **Tag** field, enter `Hole`. Click **OK**. The hole ID appears on the rich text control.

Set Default Text Style for a Hole

Your template can specify the name of a default style to use to format `Text` and `Paragraph` objects appended to a hole. If such an object does not specify a style name, the DOM API sets the `StyleName` property to the default style, which must be a character or linked character and paragraph style defined in the template. Defining a default hole style eliminates the need to format hole content programmatically.

1 Open the Word template.

2 Select the **Developer** ribbon.

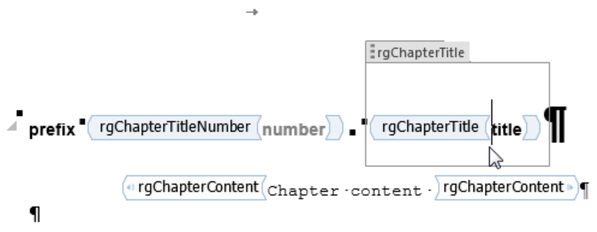
3 Click the hole whose default style name you want to specify.

If you have not created a hole, see "Inline and Block Holes" on page 11-125.

4 On the **Insert** ribbon, click the **Quick Parts** button.

5 In the Quick Parts Gallery, select the part template that contains the hole (for example, `rgChapter`).

6 Right-click in the text area of the hole whose default text style you want to specify. For example, in `rgChapter`, right-click in the `rgChapterTitle` hole.



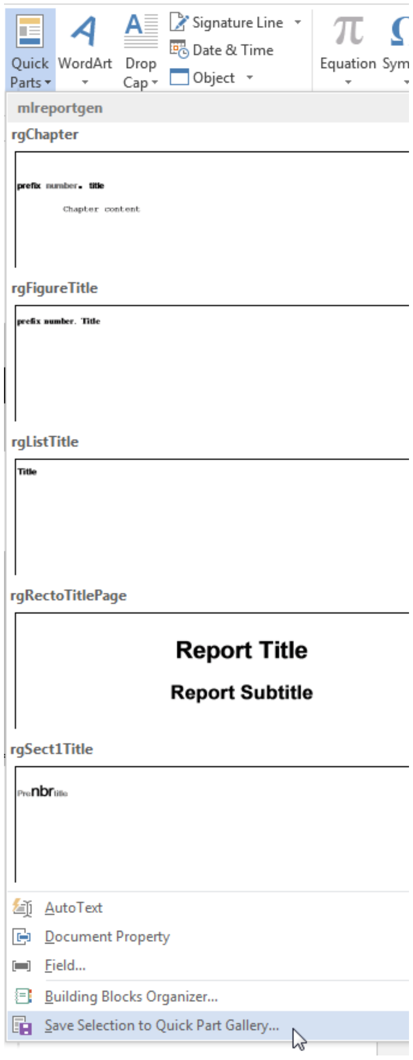
7 Select **Properties**.

8 In the Content Control Properties dialog box, select the **Use a style to format text typed into the empty control** check box.

9 From the **Style** list, select a style, or select **New Style** to create a style to use as the default style. Click **OK**.

10 Select the part template and click the **Quick Parts** button.

11 Click **Save Selection to Quick Part Gallery**.



12 In the Create New Building Block dialog box, set **Name** to the part template name (for example, `rgChapter`) and **Category** to `mlreportgen`. Click **OK**.

Related Examples

- “Modify Styles in a Microsoft Word Template” on page 11-130
- “Create an HTML or PDF Template” on page 11-135
- “Create and Format Tables” on page 11-69

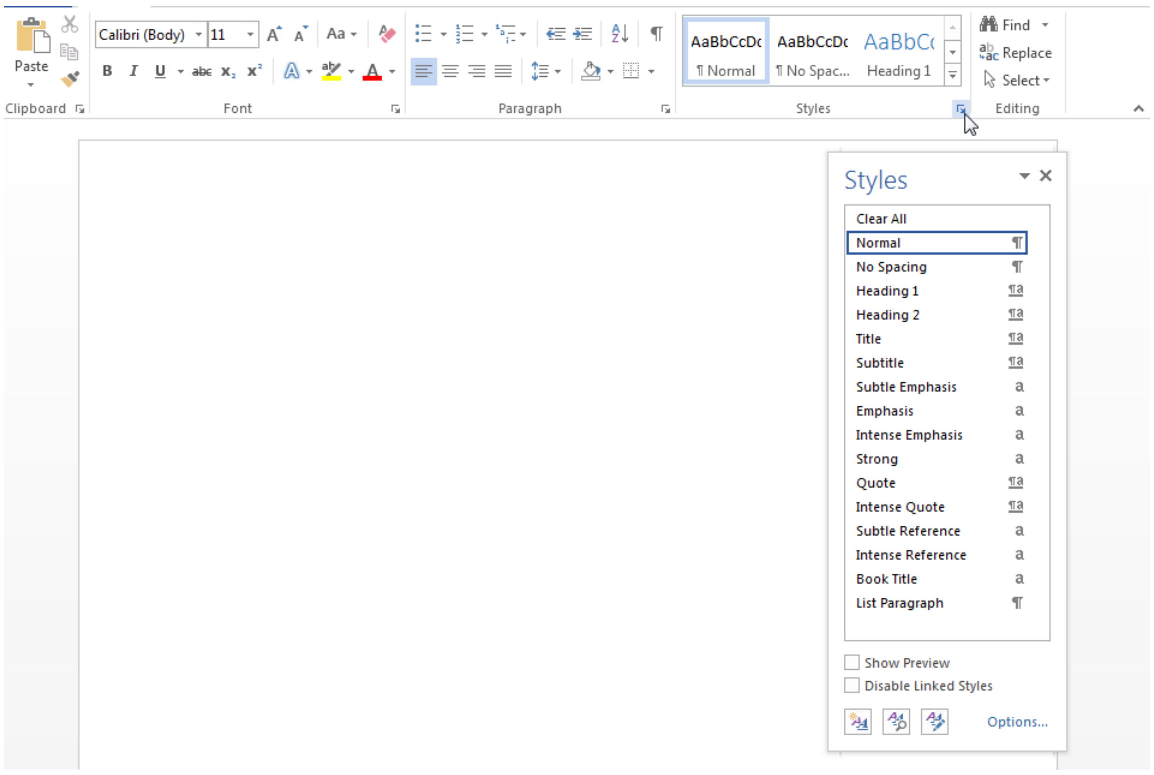
Modify Styles in a Microsoft Word Template

In this section...
"Edit Styles in a Word Template" on page 11-130
"Add Styles to a Word Template" on page 11-131

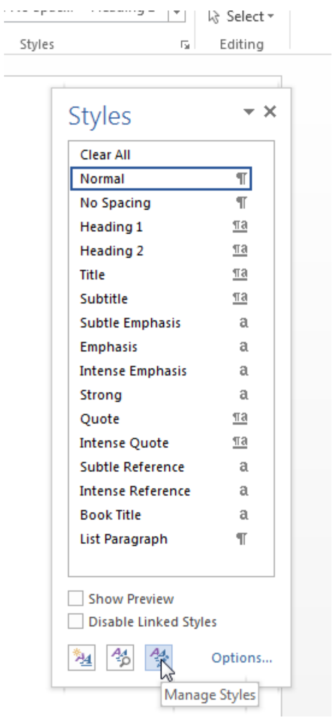
Edit Styles in a Word Template

You can modify or add format styles in a Word template.

1 In your Word template, open the Styles pane.



2 In the Styles pane, click the **Manage Styles** button.



3 In the Manage Styles dialog box, click **Modify**.

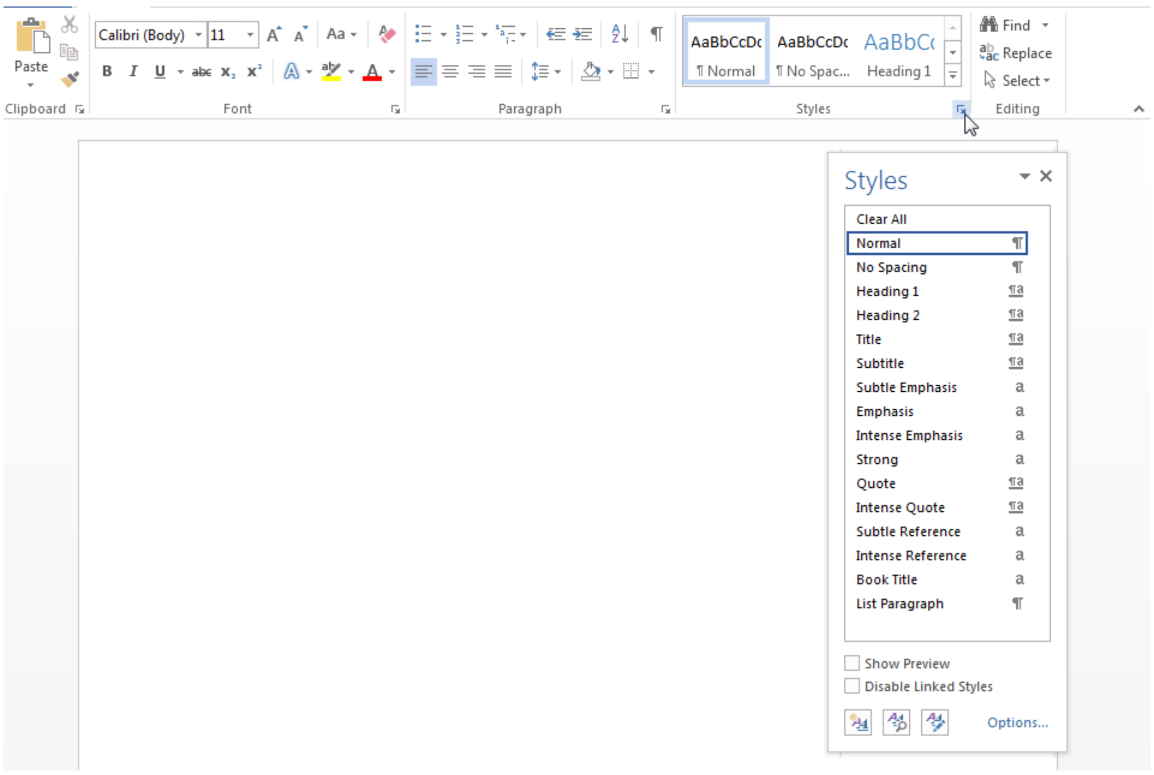
4 In the Modify Styles dialog box, change any of the style definitions. For example, change the font family, font size, or indentation. When you have finished with your changes, click **OK**, and then close the Manage Styles dialog box.

5 Save and close the template.

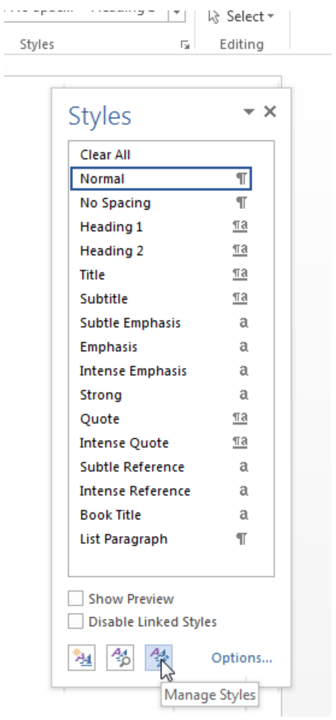
For more information about using Word styles, see the Microsoft Word documentation.

Add Styles to a Word Template

1 In your Word template, open the Styles pane.

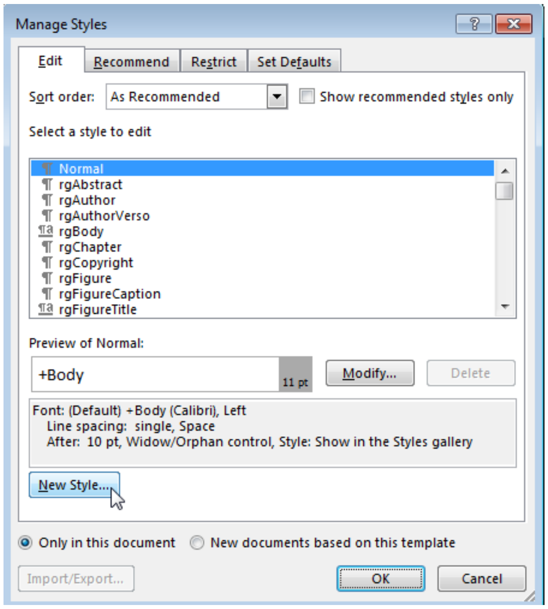


2 In the Styles pane, click the **Manage Styles** button.



3 Optionally, select an existing style to use as a starting point for the new style.

4 Click **New Style**.



Sort order: As Recommended

☐ Show recommended styles only

Select a style to edit

¶ Normal
¶ rgAbstract
¶ rgAuthor
¶ rgAuthorVerso
¶a rgBody
¶ rgChapter
¶ rgCopyright
¶ rgFigure
¶ rgFigureCaption
¶a rgFigureTitle

Preview of Normal:

+Body 11 pt

Font: (Default) +Body (Calibri), Left
Line spacing: single, Space
After: 10 pt, Widow/Orphan control, Style: Show in the Styles gallery

● Only in this document ○ New documents based on this template

5 Specify a name for the new style and define the style characteristics. To save the new style definition, click **OK** and close the dialog box.

6 Save and close the template.

Related Examples

- "Add Holes in a Microsoft Word Template" on page 11-125
- "Create an HTML or PDF Template" on page 11-135

Create an HTML or PDF Template

Use one of these approaches to create an HTML or PDF template for generating a report.

- Use `mlreportgen.dom.Document.createTemplate` to create a copy of the DOM API default template that you can then customize. For example:

  ```
  mlreportgen.dom.Document.createTemplate('mytemplate','html');
  ```
- Create a template from scratch.

Edit an HTML or PDF Template

HTML and PDF templates are packaged in a zipped template package with the extension `.htmtx` for HTML and `.pdftx` for PDF. To edit one of these templates, unzip it to a folder using the `unzipTemplate` function. For example, to unzip a template called `mytemplate` in the current folder:

```
unzipTemplate('mytemplate')
```

To repackage a template after you edit it, use the `zipTemplate` function. For example, package the template stored in a subfolder in the current folder named `mytemplate`:

```
zipTemplate('mytemplate.htmtx')
```

For PDF, use the `.pdftx` extension:

```
zipTemplate('mytemplate.pdftx')
```

If you want to work with your template in a location other than the current folder, you can specify a path with the `unzipTemplate` and `zipTemplate` functions. Make sure that the template is on the MATLAB path.

See Also

Functions
`unzipTemplate` | `zipTemplate`

Classes
mlreportgen.dom.Document

Related Examples

- “Add Holes in HTML and PDF Templates” on page 11-137
- “Modify Styles in HTML Templates” on page 11-143
- “Modify Styles in PDF Templates” on page 11-144
- “Create a Microsoft Word Template” on page 11-124

Add Holes in HTML and PDF Templates

Template holes are places in a template that a report program fills with generated content, supporting a form-based report.

Types of Holes

You can create inline and block holes.

- An inline hole is for document objects that you can append to a paragraph: `Text`, `Image`, `LinkTarget`, `ExternalLink`, `InternalLink`, `CharEntity`, and `AutoNumber` objects.
- A block hole can contain a `Paragraph`, `Table`, `OrderedList`, `UnorderedList`, `DocumentPart`, and `Group`.

Create a Hole

Use the same code to create a hole for inline and block holes. To create an inline hole, add the `<hole>` element to a paragraph. Create a block hole without a paragraph as its parent.

1 Unzip the template using the `unzipTemplate` command.

2 Open the `root.html` or `docpart_templates.html` file in an HTML or text editor.

3 Add code in any of these forms:

```
<hole id="HOLEID" default-style-name="STYLE_NAME">DESCRIPTION</hole>

<hole id="HOLEID" default-style-name="STYLE_NAME" />

<hole id="HOLEID" />
```

- Replace `HOLEID` with a string to use to identify the hole. If you need to get a hole ID or refer to a hole by ID in your report program, use this ID.
- Replace `STYLE_NAME` with the name of a default style to use for formatting the object appended to the hole. If you use this attribute, define the style in the template style sheet. Report generation uses this style if you do not specify one in your report program.

For inline holes, use a `span` element to define the default style, i.e., `span.STYLE_NAME`. For block holes, use the associated paragraph type, such as `p.STYLE_NAME` or `h1.STYLE_NAME`.

- Replace `DESCRIPTION` with text that describes the purpose of the hole.

4 Zip the template using the `zipTemplate` command.

See Also

Functions
`unzipTemplate` | `zipTemplate`

Related Examples

- "PDF and HTML Document Parts and Holes" on page 11-139
- "Simplify Filling in Forms" on page 11-49
- "Fill the Blanks in a Report Form" on page 11-33
- "Modify Styles in HTML Templates" on page 11-143
- "Modify Styles in PDF Templates" on page 11-144
- "Create a Microsoft Word Template" on page 11-124

PDF and HTML Document Parts and Holes

This example shows how to:

- Define a document part template that has holes.
- Insert the document part programmatically and fill holes.
- Insert a TOC document part.

This example uses a PDF template and report. However, you can use this same process for HTML reports. Replace the document type information with the corresponding HTML information throughout the example.

Add Template to PDF Document Part Template Library

In this example, start with the default PDF template package.

1. Create a copy of the default template package.

   ```
   mlreportgen.dom.Document.createTemplate('myPDFtemplate','pdf');
   ```
2. Unzip the template package.

   ```
   unzipTemplate('myPDFtemplate.pdftx');
   ```
3. In the current folder, open the unzipped template folder `myPDFtemplate`. Open `docpart_templates.html` in an HTML or text editor.

   The `dplibrary` element defines a document part library. The `dptemplate` element defines each document part template. This document part library has two document part templates:

   - `rgChapter`, which defines a part template for chapters
   - `ReportTOC`, which defines the table of contents

   ```
   <html>
   <body>
      <dplibrary>

      <dptemplate name="rgChapter">
         <h1 class="rgChapterTitle">
         <hole id="rgChapterTitlePrefix" default-style-name="rgChapterTitlePrefix" /><
         <hole id="rgChapterTitleNumber" default-style-name="rgChapterTitleNumber" /><
         <hole id="rgChapterTitleText" default-style-name="rgChapterTitleText" />
   ```

```
          </h1>
          <hole id="rgChapterContent"/>
         </dptemplate>

       <dptemplate name="ReportTOC">
           <TOC number-of-levels ="3" leader-pattern="dots" />
       </dptemplate>

       </dplibrary>

    </body>
    </html>
```

4 Create a document part template named `Author`. A document part can contain any combination of fixed text and holes. This document part template contains the fixed text `Author` and a hole for the author name.

```
<dptemplate name="Author">
      <p class="Author">
      <span>Author: </span><hole id="AuthorName" />
      </p>

 </dptemplate>
```

5 Add the new document part template to the library. Because you refer to the document part by name when you call it from the API, you can put the templates in any order within the library. Use a unique name for each document part template.

```
 <dplibrary>

   <dptemplate name="rgChapter">
      <h1 class="rgChapterTitle">
      <hole id="rgChapterTitlePrefix" default-style-name="rgChapterTitlePrefix" />
        <span> </span>
      <hole id="rgChapterTitleNumber" default-style-name="rgChapterTitleNumber" />
        <span>. </span>
      <hole id="rgChapterTitleText" default-style-name="rgChapterTitleText" />
      </h1>
      <hole id="rgChapterContent"/>
   </dptemplate>
   <dptemplate name="ReportTOC">
      <TOC number-of-levels ="3" leader-pattern="dots" />
  </dptemplate>
  <dptemplate name="Author">
      <p class="Author'>
```

```
        <span>Author: </span><hole id="AuthorName" />
        </p>
    </dptemplate>

  </dplibrary>
```

6 Repackage the template to a new template called `myPDFtemplate2.pdftx`.

```
zipTemplate('myPDFtemplate2.pdftx','myPDFtemplate');
```

Use the Document Part Template in a Report Program

Use mlreportgen.dom.DocumentPart to use the document part template. You need:

- The name of the template package that contains the document part. In this example, the template package name is `myPDFtemplate2`.
- The names of the document part templates to call and the order of any holes you want to fill. In this example, you call:
  - The document part template `rgChapter` and fill the first three holes in the order of prefix, number, and title
  - The `ReportTOC` document part template, which inserts a table of contents
  - The `Author` document part template you created and fill its one hole

```
import mlreportgen.dom.*
d = Document('myDocPartEx','pdf','myPDFtemplate2');
open(d);

% Assign the rgChapter document part template to the variable dp
dp = DocumentPart(d,'rgChapter');

% Move to each hole in this document part and append content
moveToNextHole(dp);
append(dp,'Chapter');
moveToNextHole(dp);
append(dp,'5');
moveToNextHole(dp);
append(dp,'Creating Document Part Templates');

% Append this document part to the document
append(d,dp);

% Append the document part ReportTOC to the document
```

```
append(d,DocumentPart(d,'ReportTOC'));

% You can append any allowable object between document parts or holes
append(d,Paragraph('Append any allowable object or a document part.'));
append(d,Paragraph('Append a document part next:'));

% Assign the Author document part template to the variable dp2
dp2 = DocumentPart(d,'Author');

% Move to the next hole and fill it
% Append the document part to the document
moveToNextHole(dp2);
append(dp2,'Charles Brown');
append(d,dp2);

close(d);
rptview(d.OutputPath);
```

The `Author` document part template includes fixed text that precedes the hole. `moveToNextHole` appends any fixed content in the template between the previous hole (or the beginning of the document part) and the current hole to the document.

Modify Styles in HTML Templates

You can customize or add format styles in the CSS files in your HTML template. You can use any CSS property in your style sheets.

1 In your unzipped template, navigate to `TEMPLATEROOT/Stylesheet`.

2 In a text or HTML editor, edit the `.css`file for the styles that you want to create or modify.

   For information about editing a cascading style sheet, see documentation such as the W3Schools.com CSS tutorial.

3 Save the style sheet.

Related Examples

- “Add Holes in HTML and PDF Templates” on page 11-137
- “Create a Microsoft Word Template” on page 11-124
- “Modify Styles in PDF Templates” on page 11-144

Modify Styles in PDF Templates

You can customize or add format styles in your PDF template using this workflow. For information on properties you can use in PDF style sheets, see “PDF Style Sheets” on page 11-144.

1 In your unzipped template, navigate to `TEMPLATEROOT/Stylesheet`.
2 In a text or HTML editor, edit the cascading style sheet (`.css`) file for the styles you want to create or modify.

   For information about editing a cascading style sheet, see documentation such as the W3Schools.com CSS tutorial.
3 Save the style sheet.

PDF Style Sheets

Use the style sheet to define global styles, that is, the appearance of your template elements. You define PDF styles primarily using a subset of cascading style sheet (CSS) formats. You can also use XSL formatting objects (FO) to format elements in a PDF template. However, to simplify and streamline your code, use FO only for properties you cannot define using CSS.

Using a style sheet for the default formats simplifies your program. You also make fewer updates when your formatting changes. Format elements in your DOM program (for example, by using an object’s `Style` property) when you want to override the default format for an instance.

You can use a subset of CSS formats and this subset of selectors and selector combinators:

- Universal selector (*)
- Type selector (for example, `p` or `span`)
- Class selector (for example, `p.MyPara`)
- Descendant combinator (space)
- Child combinator (>)
- Adjacent sibling combinator (+)
- General sibling combinator (~)

Note: You can use the generalized sibling (~) and adjacent sibling (+) selectors only when creating the report in memory. If you are using streaming mode, do not use these selectors. For information on output modes, see “Stream a Report”.

These CSS formats are supported:

- `background-color`
- `border`
- `border-bottom`
- `border-bottom-color`
- `border-bottom-style`
- `boder-bottom-width`
- `border-color`
- `border-left`
- `border-left-color`
- `border-left-style`
- `boder-left-width`
- `border-right`
- `border-right-color`
- `border-rigtht-style`
- `border-right-width`
- `border-style`
- `border-top`
- `border-top-color`
- `border-top-style`
- `border-top-width`
- `border-width`
- `color`
- `counter-increment`
- `counter-reset`
- `display`

- `font-family`
- `font-size`
- `font-style`
- `font-weight`
- `height`
- `line-height`
- `list-style-type`
- `margin`
- `margin-bottom`
- `margin-left`
- `margin-right`
- `margin-top`
- `padding`
- `padding-bottom`
- `padding-left`
- `padding-right`
- `padding-top`
- `text-align`
- `text-decoration`
- `text-indent`
- `vertical-align`
- `white-space`
- `width`

For information about these formats, see the W3Schools CSS documentation at www.w3schools.com/cssref.

For information about FO, see w3.org/2002/08/XSLFOsummary.html.

Related Examples

- “Add Holes in HTML and PDF Templates” on page 11-137
- “Create a Microsoft Word Template” on page 11-124

- “Modify Styles in HTML Templates” on page 11-143

External Websites

- w3.org/2002/08/XSLFOsummary.html
- www.w3schools.com/cssref

Create Page Layout Sections

You can divide a Word or PDF document into sections, each with its own page layout. Page layout includes page margins, page orientation, and headers and footers.

Define Page Layouts in a Word Template

Every Word template has at least one page layout section. You can use Word to create as many additional sections as you need. For example, in the main template of a report, you can create sections for your report's title page, table of contents, and chapters. See the Word documentation for information on how to create page layout sections in a Word template.

Define Page Layouts in a PDF Template

You define page layouts in a PDF template using a `<layout>` element. You can use the `<layout>` element in the main template (`root.html`), and in document part templates.

You can use these attributes with the `<layout>` element.

`style`	`page-margin: top bottom left right header footer gutter; page-size: height width orientation`
`first-page-number`	Number of first page in the layout
`page-number-format`	`n` or `N` for numeric, `a`, `A`, `i`, `I`
`section-break`	Where to start section for this layout: `Odd Page`, `Even Page`, or `Next Page`

For example, this element defines a layout with:

- Top, bottom, left, and right margins of 1 inch
- Header and footer heights of 0.5 inches
- Gutter size (space for binding pages) of 0
- 8.5-inch by 11-inch page size in portrait orientation

```
<layout style="page-margin: 1in 1in 1in 1in 0.5in 0.5in 0in;
        page-size: 8.5in 11in portrait" />
```

This <layout> element includes a page footer. The page footer DefaultPageFooter must be defined in a document part template.

```
<layout style="page-margin: 1in 1in 1in 1in 0.5in 0.5in 0in;
        page-size: 8.5in 11in portrait">
        <pfooter type="default" template-name="DefaultPageFooter" />
</layout>
```

You can create page layouts in document parts. For example, this code defines a document part template named Chapter that includes a page layout. The layout includes a page header and a page footer and specifies the format for the page number using the <pnumber> element. In this case, also define part templates for the page header and page footer elements. See “Use Page Headers and Footers in a Template” on page 11-152.

```
<dptemplate name="Chapter">
    <layout style="page-margin: 1in 1in 1in 1in 0.5in 0.5in 0in;
      page-size: 8.5in 11in portrait">
          <pheader type="default" template-name="MyPageHeader"/>
          <pfooter type="default" template-name="MyPageFooter"/>
          <pnumber format="1" />
    </layout>
<!-- Define content for your layout here--fixed text and holes as needed -->
</dptemplate>
```

To use the layout, insert the document part into your report using your program. This code assumes that there is one hole in the document part Chapter. The document part uses the page layout definition you provided in the Chapter document part template.

```
import mlreportgen.dom.*
d = Document('myDocPartEx','pdf','mytemplate');
open(d);

% Assign the Chapter document part template to the variable dp
dp = DocumentPart(d,'Chapter');

% Move to each hole in this document part and append content
moveToNextHole(dp);
append(dp,'My text to fill hole');

% Append this document part to the document
append(d,dp);

close(d);
```

```
rptview(d.OutputPath);
```

Navigate Template-Defined Page Layouts

A document or document part's `CurrentPageLayout` property points to a page layout object that specifies the current section's page layout based on the document or document part's template. Each time you move to a new section (by moving to a hole at the beginning of the section), the DOM updates the `CurrentPageLayout` property to point to the page layout object that specifies the section's page layout properties. You can change a section's page layout by modifying the properties of the layout object or replacing the layout object with a new object.

For example, you can change the section's orientation or add page headers or footers. Make these changes before you add any content to the new section. When replacing the current layout object, use a `mlreportgen.dom.DOCXPageLayout` object for Word documents and `mlreportgen.dom.PDFPageLayout` for PDF documents.

Override Template Page Layouts in Your Report Program

You can change the template-defined layout properties programmatically. For example, the page orientation of the DOM default Word template is portrait. This example changes the orientation to landscape to accommodate wide tables. The code swaps the height and width of the page to the new page orientation.

```
import mlreportgen.dom.*
rpt = Document('test','docx');
open(rpt);

sect = rpt.CurrentPageLayout;
pageSize = sect.PageSize;
pageSize.Orientation = 'landscape';

saveHeight = pageSize.Height;
pageSize.Height = pageSize.Width;
pageSize.Width = saveHeight;

table = append(rpt,magic(22));
table.Border = 'solid';
table.ColSep = 'solid';
table.RowSep = 'solid';

close(rpt);
```

```
rptview(rpt.OutputPath);
```

Create Layouts Programmatically

You can append a `DOCXPageLayout` object (for Word documents) or a `PDFPageLayout` object (for PDF documents) to start a new page layout section programmatically. For DOCX reports, the `append` method can specify a paragraph to end the previous section.

```
append(rptObj,paraObj,LayoutObj)
```

If you do not specify a paragraph in your `append` method, the DOM API inserts an empty paragraph before starting the new section. This example uses the end paragraph syntax to avoid inserting an empty paragraph at the end of the previous section.

```
import mlreportgen.dom.*
rpt = Document('test','docx');

append(rpt,Heading(1,'Magic Square Report','Heading 1'));

sect = DOCXPageLayout;
sect.PageSize.Orientation = 'landscape';
sect.PageSize.Height = '8.5in';
sect.PageSize.Width = '11in';
append(rpt,Paragraph('The next page shows a magic square.'),sect);

table = append(rpt,magic(22));
table.Border = 'solid';
table.ColSep = 'solid';
table.RowSep = 'solid';

close(rpt);
rptview(rpt.OutputPath);
```

See Also

Classes

mlreportgen.dom.DOCXPageLayout | mlreportgen.dom.PageMargins | mlreportgen.dom.PageSize | mlreportgen.dom.PDFPageLayout

Related Examples

- "Create a Microsoft Word Template" on page 11-124

Create Page Footers and Headers

You can create page headers and page footers in Word and PDF reports. You can create page headers and page footers in each layout for each of these types of pages:

- The first page of the section
- Even pages
- Odd pages, which include the first page if you do not specify a first-page header or footer

You can create report page headers and footers programmatically or in the template to use with the report. You can append content to the footers.

When you open a report, the DOM API:

1. Reads the headers and footers from the template and converts them to PDF or DOCX `PageHeader` and `PageFooter` objects
2. Associates the headers and footer objects with the DOCX or PDF `PageLayout` object that defines the properties of the section that contains the headers and footers
3. Adds the headers and footers to your report as your code navigates the sections defined by the template

As your report program navigates the sections, it can append content to the template-defined headers and footers.

Use Page Headers and Footers in a Template

You can insert page headers and footers in the main template or in a document part template. The approach differs for Word and for PDF.

Page Headers and Footers in a Word Template

Every page in a Word document has a header and footer that you can edit. To enable editing mode, double-click the header or footer area. Alternatively, on the Word **Insert** tab, in the **Header & Footer** section, click the **Header** or **Footer** button arrow. From the menu, select the corresponding **Edit** command. When you have finished editing the header or footer, on the **Header & Footer Tools Design** tab, click **Close Header and Footer**.

In editing mode, you can modify the header or footer by:

- Inserting text, holes, page numbers, and images
- Formatting the items you add, for example, by specifying the page number type
- Resizing the header or footer
- Specifying a different header or footer for the first page, odd pages, and even pages
- Inserting Word fields

  The fields mechanism helps you to generate header or footer content that varies from page to page. To see the fields you can insert, click the **Explore Quick Parts** button and select **Field**. The `StyleRef` field is useful for inserting chapter or section titles in the footer. See “Create Running Page Headers and Footers” on page 11-157.

For details about working with Word page headers and footers, see the Word documentation.

You can modify the page headers and footers directly in the main template. To add a page header or footer in a document part template, modify the page header and footer as you want. Select the entire page using **CTRL+A** before you save the part to the Quick Parts Gallery. For details on adding and modifying document part templates, see “Create a Microsoft Word Document Part Template Library” on page 11-37.

You can insert a page number in a header or footer. On the **Header & Footer Design** tab, use the **Page Number** menu to insert a page number. To access formatting options, in the header or footer, right-click the page number and select **Format Page Numbers**.

Page Headers and Footers in a PDF Template

Adding page headers and footers in a PDF template involves these steps:

- Add `<pheader>` and `<pfooter>` elements to a page layout that you define using the `<layout>` element. You can add the header and footer elements to the layout in the main template (`root.html`) or in a document part template.
- Define a document part template for each page header or footer style.

Note: If you insert the header or footer into a layout only programmatically, you do not need to add the `<pfooter>` or `<pheader>` element to a template `<layout>` element.

The table shows the attributes that you can use with `<pheader>` and `<pfooter>`. These elements correspond with the DOM classes mlreportgen.dom.PDFPageHeader and mlreportgen.dom.PDFPageFooter.

Element	Attributes	Values
pheader	type	default, first, even
	template-name	Document part template that defines the header
pfooter	type	default, first, even
	template-name	Document part template that defines the footer

For example, this code defines a document part template Chapter that uses two page footers: one for odd pages and one for even pages. The page number format is Arabic numerals.

```
<dptemplate name="Chapter">
     <layout style="page-margin: 1in 1in 1in 1in 0.5in 0.5in 0in;
      page-size: 8.5in 11in portrait">
         <pfooter type="default" template-name="MyPageFooter"/>
       <pfooter type="even" template-name="MyEvenFooter"/>
         <pnumber format="1" />
      </layout>
<!-- Define  content for your chapter here--fixed text and holes as needed -->
</dptemplate>
```

Define the document part templates MyPageFooter and MyEvenFooter in the docpart_templates.html file. For example, define the page footers so that:

- All footers insert a page number. To insert a page number, use the <page> element.
- The odd page numbers align right. The default value for type on the pfooter element specifies first and odd pages.
- The even page numbers align left.

These document part templates define the page footers.

```
<dptemplate name="MyPageFooter">
    <p style="text-align:right;font-family:Arial,Helvetica,sans-serif;font-size:10pt">
    <page/></p>
</dptemplate>
<dptemplate name="MyEvenFooter">
    <p style="text-align:left;font-family:Arial,Helvetica,sans-serif;font-size:10pt">
    <page/></p>
</dptemplate>
```

These DOM API HTML elements are useful in headers and footers. For example, you can add page numbers to headers and footers in the form Page 1 of 3 using `<page>` and `<numpages>`. See mlreportgen.dom.NumPages for the equivalent programmatic approach. You can also generate content in the header or footer that changes based on the content of a specified element (style) on the page. See “Create Running Page Headers and Footers” on page 11-157.

Purpose	Element	Attributes	Values
Page number format (same as `first-page-number` and `page-number-format` on layout)	`pnumber`	`format`	`n` or `N` for numeric, `a`, `A`, `i`, `I`
		`initial-value`	The number for the first page in the layout that uses this element
Current page number	`page`	No attributes	n/a
Total number of pages in document	`numpages`	No attributes	n/a
Insert content of a heading or other style into a page header or footer (for running headers and footers)	`styleref`	No attributes	Inserts content of nearest `h1` element.
		`style-name` or	Name of the style with content to insert in the header or footer, or
		`outline-level`	Outline level of style with content to insert in the header or footer

Access Template-Defined Headers and Footers

Use the `CurrentPageLayout` property of a `Document` or `DocumentPart` object to access the template-defined headers and footers for the current section of a document or document part.

The value of the `CurrentPageLayout` property is a `DOCXPageLayout` or `PDFPageLayout` object whose `PageHeaders` and `PageFooters` properties contain a cell array of objects corresponding to the template-defined headers and footers of the current section. Each cell array can contain up to three objects, depending on how many of the three types of headers and footers (first page, even page, odd page) you define for the section. The objects can appear in any order in the cell array. Thus, to access a header or footer of a particular type, search the cell array to find the one you want to access.

Append Content to a Template-Defined Header or Footer

You can use the DOM API to append content to a template-defined header or footer that appears on every page in a section. To append content to a header or footer in the current section of a document or document part, first use the document or document part `CurrentPageLayout` property to access the DOCX or PDF `PagerHeader` or `PageFooter` object. Then use the `append` method of a `PageHeader` or `PageFooter` object to append content.

Header and footer objects are a type of document part object. You can append any kind of content to a page header or footer that you can append to a document part, for example, paragraphs, images, and tables.

You can use holes in the header and footers of your main template to control the positioning of content that you append to the headers and footers. For example, this program appends today's date to a hole named `Date` on the first template-defined page header of the first section of a report. This example assumes that the Word template `MyReportTemplate` has one layout that defines a first page, odd page, and even page header and footer.

```
import mlreportgen.dom.*;
d = Document('MyReport','docx','MyReportTemplate');
open(d);

sect = d.CurrentPageLayout;

for i = 1:numel(sect.PageHeaders)
    if strcmpi(sect.PageHeaders(i).PageType,'first')
        firstPageHeader = sect.PageHeaders(i);
        while ~strcmp(firstPageHeader.CurrentHoleId,'#end#')
            switch firstPageHeader.CurrentHoleId
                case 'Date'
                    append(firstPageHeader,date);
            end
            moveToNextHole(firstPageHeader);
        end
        break;
    end
end

close(d);
rptview(d.OutputPath);
```

Create Running Page Headers and Footers

A running page header or footer contains content that varies from page to page based on context. For example, the name of the current chapter or section changes from page to page. You can insert the current content in a page header or footer.

You can create running page headers and footers programmatically or in a template.

Create Running Page Headers and Footers in a Template

"Page Headers and Footers in a Word Template" on page 11-152 describes the general approach to editing page headers and footers in Word. To add running text, insert a `StyleRef` field. This field is equivalent to the DOM API mlreportgen.dom.StyleRef class. To insert this field in a Word template or document part template:

1. Open the header or footer for editing.
2. On the **Insert** tab, from the **Quick Parts** button menu, select **Field**.
3. In the Field dialog box, from the **Field names** list, select `StyleRef`. From the **Style name** list, select the name of the style that contains the text that you want to include in the running header or footer.

   For example, select `Heading 1` to use the content of paragraphs formatted with the Heading 1 style. Your report must create content that uses that style for the content to appear in the header or footer.
4. Click **OK**.

For PDF documents, to include running text, use a `<styleref>` element. Add code like this to your template's `docpart_templates.html` library file. The `<styleref>` element uses the `Heading1` object for the content by default.

```
<dptemplate name="RunningFooter">
    <p style="text-align:center;font-family:sans-serif;font-size:10pt">
         <styleref/>
    </p>
 </dptemplate>
```

To see the effect, add the page footer in the `<layout>` element of your template's `root.html` file. You can insert it in any `<layout>` element your template defines.

```
<layout style="page-margin: 1in 1in 1in 1in 0.5in 0.5in 0in;
       page-size: 8.5in 11in portrait">
       <pfooter template-name="RunningFooter" />
</layout>
```

Use code that creates `Heading1` objects and calls your template to see the result. This code assumes that you defined the footer document part template in the template `RunFooters`.

```
import mlreportgen.dom.*;
d = Document('mydoc','pdf','RunFooters');
open(d);

title = append(d, Paragraph('Document Title'));
title.Bold = true;
title.FontSize = '28pt';

h1 = append(d,Heading1('My First Chapter'));
p1 = append(d,Paragraph('Hello World'));

h2 = append(d,Heading1('My Second Chapter'));
h2.Style = {PageBreakBefore(true)};
p2 = append(d,Paragraph('Text for this chapter.'));

close(d);
rptview(d.OutputPath);
```

To refer to the page footer programmatically, use code in this form. The first argument is the type of footer, the second is the template package, and the third is the document part template.

```
PDFPageFooter('default','RunFooters','RunningFooter');
```

This code creates the footer in the current page layout without relying on the template to insert the footer. It uses the template only for the definition of the document part template.

```
import mlreportgen.dom.*;
d = Document('mydoc','pdf','RunFooters');
open(d);

myfooter = PDFPageFooter('default','RunFooters','RunningFooter');
```

```
d.CurrentPageLayout.PageFooters = myfooter;

title = append(d,Paragraph('Document Title'));
title.Bold = true;
title.FontSize = '28pt';

h1 = append(d,Heading1('My First Chapter'));
p1 = append(d,Paragraph('Hello World'));

h2 = append(d,Heading1('My Second Chapter'));
h2.Style = {PageBreakBefore(true)};
p2 = append(d,Paragraph('Text for this chapter.'));

close(d);
rptview(d.OutputPath);
```

Create Running Page Headers and Footers Programmatically

The DOM API provides classes that help you to create running headers and footers programmatically in Word and PDF documents.

- To insert a chapter title in a page header or footer, see mlreportgen.dom.StyleRef.
- To work with page headers and footers, see mlreportgen.dom.DOCXPageHeader, mlreportgen.dom.DOCXPageFooter, mlreportgen.dom.PDFPageHeader, and mlreportgen.dom.PDFPageFooter.

Create Page Headers and Footers Programmatically

Programmatically create a page header or footer in the current section of a report. You can use the same technique for PDF, using `PDFPageHeader` and `PDFPageFooter` in place of the corresponding DOCX parts.

1. Use the `DOCXPageHeader` or `DOCXPageFooter` constructor to create the desired type of page header or footer (first page, odd page, even page, or odd and even page) based on a template that defines template form (the fixed content and holes for variable content).
2. Fill the holes in the header or footer with content.
3. Insert the header or footer in the array of page headers or footers of the current `PageLayout` object.

This code creates a first page header from a template stored in the document part template library of a report.

```
import mlreportgen.dom.*;
d = Document('MyReport','docx','MyReportTemplate');
open(d);

pageHeaders(1) = DOCXPageHeader('first',d,'FirstPageHeader');

while ~strcmp(pageHeaders(1).CurrentHoleId,'#end#')
    switch pageHeaders(1).CurrentHoleId
        case 'Date'
            append(pageHeaders(1),date);
    end
    moveToNextHole(pageHeaders(1));
end

d.CurrentPageLayout.PageHeaders = pageHeaders;

close(d);
rptview(d.OutputPath);
```

- To insert a page number, use an mlreportgen.dom.Page object.
- To insert a page number in the form Page [current page] of [total pages], see mlreportgen.dom.NumPages.
- To insert complex page numbers in a Word report, in the form [Chapter #]–[Current Page #], see “Add Complex Page Numbers in Microsoft Word” on page 11-162.

See Also

Functions
mlreportgen.dom.Document.createTemplate

Classes
mlreportgen.dom.Document | mlreportgen.dom.DocumentPart | mlreportgen.dom.DOCXPageFooter | mlreportgen.dom.DOCXPageHeader | mlreportgen.dom.DOCXPageLayout | mlreportgen.dom.NumPages | mlreportgen.dom.Page | mlreportgen.dom.PDFPageFooter | mlreportgen.dom.PDFPageHeader | mlreportgen.dom.PDFPageLayout | mlreportgen.dom.StyleRef

Related Examples

- “Create a Microsoft Word Template” on page 11-124

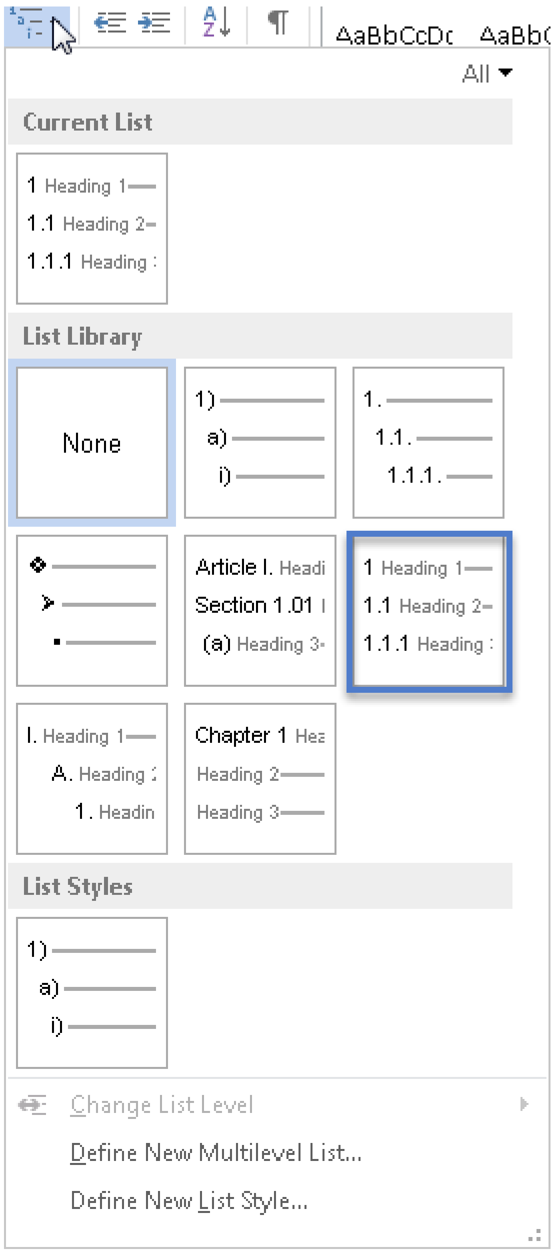
- "Create an HTML or PDF Template" on page 11-135
- "Add Complex Page Numbers in Microsoft Word" on page 11-162

Add Complex Page Numbers in Microsoft Word

This example adds a complex page number to footers in Microsoft Word document. A complex number has the form [Chapter #][separator][Page#], for example, 7–1. You can add this type of number in a header or footer. You can do this using a template, by inserting a page number in a footer, and specifying the page number properties.

Whether you are using a template or a program, your template must use a multilevel list for the heading level that contains the chapter to reference. To create this type of list:

1. In your Word template, on the **Home** tab, click the **Multilevel List** button.
2. Select the numbered heading item.


AaBbCcDc AaBbC
All
Current List
1 Heading 1
1.1 Heading 2
1.1.1 Heading
List Library
None
1) a) i)
1. 1.1. 1.1.1.
Article I. Headi
Section 1.01
(a) Heading 3
1 Heading 1
1.1 Heading 2
1.1.1 Heading
I. Heading 1
A. Heading
1. Headin
Chapter 1 Hea
Heading 2
Heading 3
List Styles
1) a) i)
Change List Level
Define New Multilevel List...
Define New List Style...

3 Apply the Normal style to the paragraph.

4 Save and close the template.

You can then use a program like this one to use the complex page number. The `ChapterStartStyle` and `ChapterSeparator` properties on the `PageNumber` object specify to use heading level 1 for the chapter number and an en-dash as a separator.

```
import mlreportgen.dom.*;
d = Document('mypages','docx','numberChapters');

open(d);
layout = d.CurrentPageLayout;

% Page number formatting
pgnum = PageNumber(1,'n');
pgnum.ChapterStartStyle = '1';
pgnum.ChapterSeparator = 'endash';

% Add page number object to page layout styles
layout.Style = {pgnum};
% layout.Style = [layout.Style {pgnum}];

% Create the footer object and insert a page number
myfooter = DOCXPageFooter();
para = Paragraph();
para.HAlign = 'center';
append(para,Page());
append(myfooter,para);

% Set PageFooters on the current layout to your footer object
layout.PageFooters = myfooter;

% Create content
for i=1:5
     title = append(d,Heading1(['Chapter' num2str(i)]));
     title.Style = {PageBreakBefore};
     for j=1:30
     append(d,'This is the body of the chapter');
     end
 end

close(d);
rptview(d.OutputPath);
```

Tip Create a page layout for each chapter to restart numbering the pages for each chapter at 1.

See Also

mlreportgen.dom.DOCXPageFooter | mlreportgen.dom.DOCXPageLayout | mlreportgen.dom.PageNumber

Programmatic PowerPoint Presentation Creation

Create a Presentation Program

In this section...

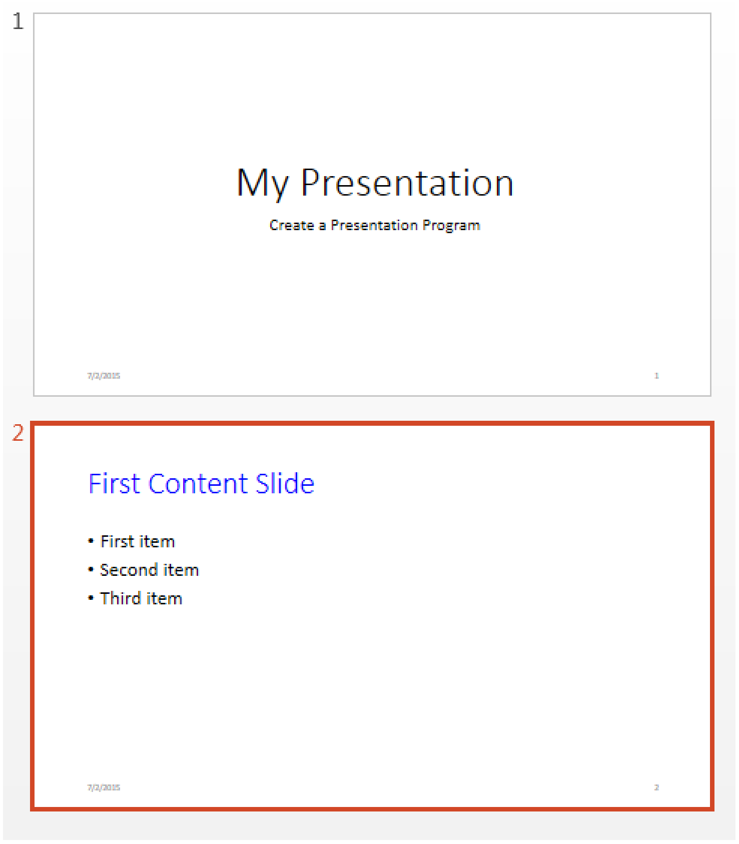
You can use the MATLAB API for PowerPoint (PPT API) to update and create PowerPoint presentations programmatically. For example, this MATLAB script creates a presentation that has a title page and one content slide with a bulleted list.

```
import mlreportgen.ppt.*;

slidesFile = 'mySlides.pptx';
slides = Presentation(slidesFile);

slide1 = add(slides,'Title Slide');
replace(slide1,'Title','My Presentation');
replace(slide1,'Subtitle','Create a Presentation Program');

slide2 = add(slides,'Title and Content');
para = Paragraph('First Content Slide');
para.FontColor = 'blue';
replace(slide2,'Title',para);

replace(slide2,'Content',{'First item','Second item','Third item'});

close(slides);
```

After you create the presentation, which is named `MySlides.pptx`, you can open it. On a Windows platform, you can open the presentation in MATLAB:

```
if ispc
    winopen(slidesFile);
end
```

The generated presentation `MySlides.pptx` includes these two slides.



PPT API Programs

PPT API programs generally include code that:

- Imports the `mlreportgen.ppt` API package. Include an `import` statement. To omit the package name when you invoke PPT API object constructors and method, import the package.

  ```
  import mlreportgen.ppt.*;
  ```
- Creates a `Presentation` object to:
  - Hold the presentation contents

  - Specify the output location for the generated presentation
  - Indicate the PowerPoint template

  ```
  slidesFile = 'mySlides.pptx';
  slides = Presentation(slidesFile);
  ```

- Adds or replaces slide content.

  ```
  contents = find(slide2,'Title');
  replace(contents,Paragraph('First Content Slide'));

  contents = find(slide2,'Content');
  datePara = Paragraph('Today is ');
  dateText = date;
  append(datePara,dateText);
  add(contents,datePara);
  ```

  The PPT API replaces PowerPoint template placeholders with content defined in the program. In the template, you can interactively add placeholders or rename placeholders for your program to interact with.

- Closes the presentation, which generates the content and formatting of the presentation.

  ```
  close(slides);
  ```

You can include code to open the presentation on Windows platforms. Use `winopen` with the name of the file, which in this case is stored in the `slidesFile` variable.

```
if ispc
    winopen(slidesFile);
end
```

To see another example of a PPT API program in MATLAB, enter `population_slides`.

Two Ways to Use the PPT API

You can create a PPT API program that:

- Replaces content in, or adds content to, an existing PowerPoint presentation
- Generates a complete PowerPoint presentation

Add Content to an Existing Presentation

To add or update content to an existing presentation without manually updating the presentation each time content changes, use the PPT API. This approach is useful when you want to use most of the content and formatting in an existing presentation.

- You can use the PPT API and MATLAB functions to generate content for a presentation from MATLAB code and Simulink models.
- You can update a presentation by overwriting the presentation file or create a separate version of the presentation with a different presentation name.

Create a Complete Presentation

To create a complete presentation when you want to use the same content using multiple PowerPoint templates, use the PPT API.

PPT API Applications and PowerPoint Templates

The PPT API uses PowerPoint presentations as templates to generate presentations. The template can be an empty presentation or a presentation with slides.

You can use the following as templates for a PPT API presentation:

- The default PPT API PowerPoint template
- An existing PowerPoint presentation whose content you want to update
- A PowerPoint template

Templates allow you to specify the fixed content and default layout and appearance of the slides in your presentations. Your MATLAB program can use the PPT API to override the default layout and format of specific slides.

The PPT API comes with a default template that you can use to create presentations. If the default template does not meet your needs, you can use PowerPoint interactively to create templates that do meet your needs.

Template Elements

PowerPoint templates include several elements that the PPT API uses to generate a presentation. To customize formatting defined in a template, modify one or more of these template elements.

PowerPoint Template Element	Purpose
Slide masters	Applies the slide master formatting globally to the presentation. Specifies a layout and formats common to a set of slide layouts
Slide layouts	Specifies a variant of a slide master layout.
Table styles	Specifies the default appearance of a table. PowerPoint defines a standard set of table styles. You cannot modify these styles but you can use the PPT API to apply these styles to tables you create and override the styles for particular tables.
Placeholders	Specifies an area of a slide layout that you can replace with a text string, list, picture, table, or other content. Every placeholder has a name. You can use PowerPoint interactively to assign a name to a placeholder. You can then use the name in your PPT program to replace the placeholder with content.

Related Examples

- "Create PPT Objects"
- "Create a Presentation Object to Hold Content" on page 12-13
- "Update Presentation Content Programmatically" on page 12-48
- "Create a Presentation Programmatically" on page 12-59

Create PPT Objects

In this section...
"PPT Objects" on page 12-7
"Use a PPT Constructor" on page 12-7
"PPT Objects Created Without Constructors" on page 12-8

PPT Objects

The PPT API consists of a hierarchical set of data structures, known as objects, that represent a presentation and its contents. The top of the hierarchy has an object representing the presentation. The PPT API maintains a list of objects, called the presentation children, that represent the presentation contents (slides, paragraphs, tables, pictures, etc.). Each child object, in turn, maintains a list of its contents. For example, the children of a table object are its row objects, the children of a row object are its entry objects, and so on.

The PPT API contains functions (also known as methods) to create and assemble PPT objects, such as paragraphs and tables, and add the objects to slides.

The PPT API includes format objects, such as bold and font color objects, that you can use to define formatting for presentation elements.

To generate a PowerPoint presentation file, use the PPT API. You can open, view, and edit the generated presentation as you do with any other PowerPoint presentation.

Use a PPT Constructor

The PPT API includes a set of MATLAB functions, called constructors, that you use to create PPT objects of various types.

The name of an object constructor is the name of the MATLAB class from which the PPT API creates an object. For example, the name of the constructor for a PPT paragraph object is `mlreportgen.ppt.Paragraph`. Some constructors do not require any arguments. Other constructors can take arguments that typically specify its initial content and properties. For example, this code creates a paragraph object, `p`, whose initial content is `Slide 1`.

```
p = mlreportgen.ppt.Paragraph('Slide 1');
```

A constructor returns a handle to the object it creates. Assigning the handle to a variable allows you to append content to the object or set its properties. For example, this code appends content to the paragraph object `p`.

```
append(p,'-- In the Beginning');
```

PPT Objects Created Without Constructors

You can use some PPT API functions to create PPT objects without including a constructor in your code. For example, to create a slide, add a slide layout to a presentation without an `mlreportgen.ppt.Slide` constructor. This code uses an `add` method for the `mlreportgen.ppt.Presentation` object `slides`. The `add` method creates a `Slide` object named `slide1` based on the `Title Slide` layout in the default PPT API PowerPoint template.

```
import mlreportgen.ppt.*;
slides = Presentation('MySlides');

slide1 = add(slides,'Title Slide')
```

```
slide1 = 

  Slide with properties:

         Layout: 'Title Slide'
    SlideMaster: 'Office Theme'
           Name: ''
          Style: []
       Children: [1x2 mlreportgen.ppt.TextBoxPlaceholder]
         Parent: [1x1 mlreportgen.ppt.Presentation]
            Tag: 'ppt.Slide:16'
             Id: '16'
```

See Also

Functions
mlreportgen.ppt.Presentation.add

Classes
mlreportgen.ppt.Presentation | mlreportgen.ppt.Slide

Related Examples

- “Import the PPT API Package”
- “Create a Presentation Object to Hold Content” on page 12-13

Import the PPT API Package

All PPT class names and constructor names have the prefix `mlreportgen.ppt`. To omit the prefix in your code, insert this statement at the beginning of a PPT API program.

```
import mlreportgen.ppt.*;
```

Examples that refer to PPT API objects and functions without the `mlreportgen.ppt` prefix assume that you have imported the PPT API package.

Related Examples

- "Create PPT Objects" on page 12-7
- "Get and Set PPT Object Properties" on page 12-11
- "Create a Presentation Program" on page 12-2

Get and Set PPT Object Properties

Most PPT objects have properties that describe the object. For example, `Paragraph` objects have properties such as `Bold`, `FontColor`, and `Level`. You can set the value of most object properties.

To get or set the property of PPT object, use dot notation:

- Append a period to the name of a variable that references the object.
- Add the property name after the period.

For example, this code creates a paragraph containing the text `Hello World` and colors the text green.

```
p = Paragraph('Hello World')

p =

  Paragraph with properties:

           Bold: []
      FontColor: []
         Italic: []
         Strike: []
      Subscript: []
    Superscript: []
      Underline: []
          Level: []
          Style: []
       Children: [1x1 mlreportgen.ppt.Text]
         Parent: []
            Tag: 'ppt.Paragraph:1534'
             Id: '1534'

p.FontColor = 'green';
```

This code displays the properties of the first child of the paragraph `p`.

```
p.Children

ans =

  Text with properties:
        Content: 'Hello World'
           Bold: []
      FontColor: []
         Italic: []
         Strike: []
      Subscript: []
    Superscript: []
      Underline: []
          Style: []
       Children: []
         Parent: [1x1 mlreportgen.ppt.Paragraph]
            Tag: 'ppt.Text:1535'
             Id: '1535'
```

Related Examples

- "Use Format Properties" on page 12-45
- "Create PPT Objects" on page 12-7

More About

- "Presentation Formatting Approaches" on page 12-20

Create a Presentation Object to Hold Content

Every PPT API program must create an `mlreportgen.ppt.Presentation` object to hold presentation content. To create a presentation object, use the `mlreportgen.ppt.Presentation` constructor.

If you use the constructor without arguments, the PPT API creates a presentation named `Untitled.pptx` in the current folder. The presentation uses the default PPT API PowerPoint template.

You can specify the file system path of the presentation as the first argument of the constructor.

For the second argument of the constructor, you can specify a PowerPoint template to use. This `Presentation` constructor creates a presentation called `myPresentation` in the current folder, using a PowerPoint template called `CompanyTemplate.pptx`.

```
pres = Presentation('myPresentation','CompanyTemplate.pptx');
```

If the template you use is an existing presentation that includes content, the new presentation that the PPT API generates includes the content in that presentation. You can replace content from the template using the PPT API. To replace some of the content in an existing presentation but leave the rest, use the presentation as the template for the `Presentation` object you create.

When you create a complete presentation using the PPT API, use an empty presentation that has no slides or only a few slides.

See Also

mlreportgen.ppt.Presentation

Related Examples

- “Create a Presentation Program” on page 12-2
- “Create PPT Objects” on page 12-7
- “Generate a Presentation” on page 12-14

More About

- “Access PowerPoint Template Elements” on page 12-37

Generate a Presentation

To generate a PowerPoint presentation from your PPT API program, use the API to close the presentation. For example, to generate a presentation whose `Presentation` object is `slides`:

```
close(slides);
```

Generating a presentation overwrites the previous version of the presentation file. Closing a presentation creates or overwrites a `.pptx` file in the path that you specify in the `Presentation` object constructor. For example, closing this presentation creates a `MyPresentation.pptx` file in the current folder:

```
import mlreportgen.ppt.*;
slides = Presentation('MyPresentation');
add(slides,'Title and Content');
close(slides);
```

Note: If the presentation (`.pptx`) file is already open in PowerPoint, interactively close the PowerPoint presentation file before you generate the presentation using the PPT API program.

Related Examples

- "Display Presentation Generation Messages" on page 12-15

Display Presentation Generation Messages

In this section...

Presentation Generation Messages

The PPT API can display messages when you generate a PowerPoint presentation. The messages are triggered every time a presentation element is created or appended during presentation generation.

You can define additional messages to display while a presentation generates. The PPT API provides these classes for defining messages:

- `ProgressMessage`
- `DebugMessage`
- `WarningMessage`
- `ErrorMessage`

The PPT API provides additional classes for handling presentation message dispatching and display. It uses MATLAB events and listeners to dispatch messages. A message is dispatched based on event data for a specified PPT object. For an introduction to events and listeners, see “Event and Listener Concepts”.

Note: When you create a message dispatcher, the PPT API keeps the dispatcher until the end of the current MATLAB session. To avoid duplicate reporting of message objects during a MATLAB session, delete message event listeners.

Display PPT Default Messages

This example shows how to display the default PPT debug messages. Use a similar approach for displaying other kinds of PPT presentation messages.

1 Create a message dispatcher, using the `MessageDispatcher.getTheDispatcher` method. Use the same dispatcher for all messages.

   ```
   dispatcher = MessageDispatcher.getTheDispatcher;
   ```

2 To display debug messages, use the `MessageDispatcher.Filter` property.

   ```
   dispatcher.Filter.DebugMessagesPass = true;
   ```

3 Add a listener using the MATLAB `addlistener` function. Specify the dispatcher object, the source and event data, and a `disp` function that specifies the event data and format for the message.

   ```
   l = addlistener(dispatcher,'Message', ...
         @(src, evtdata) disp(evtdata.Message.formatAsText));
   ```

4 Add code that deletes the listener after the code that generates the presentation.

   ```
   delete(l);
   ```

This presentation displays debug messages.

```
import mlreportgen.ppt.*;

dispatcher = MessageDispatcher.getTheDispatcher;
dispatcher.Filter.DebugMessagesPass = true;

l = addlistener(dispatcher,'Message', ...
      @(src, evtdata) disp(evtdata.Message.formatAsText));

slides = Presentation('myMessagePresentation');
titleSlide = add(slides,'Title and Content');

p = Paragraph('Hello World:');
p.Style = {Bold(true)};
t = Text('  How are you?');
t.Bold = false;
append(p,t);


add(titleSlide,'Content',p);

close(slides);

delete(l);
```

Create and Display a Progress Message

This example shows how to create and dispatch a progress message. You can use a similar approach for other kinds of messages, such as warnings.

1 Create a message dispatcher.

   ```
   dispatcher = MessageDispatcher.getTheDispatcher;
   ```

2 Add a listener using the MATLAB `addlistener` function.

   ```
   l = addlistener(dispatcher,'Message', ...
         @(src, evtdata) disp(evtdata.Message.formatAsText));
   ```

3 Dispatch the message, using the `Message.dispatch` method. Specify the dispatcher object and the message to dispatch. Here the message is a debug message called `firstSlide`, and the `Presentation` object `slides` is the source of the message.

   ```
   dispatch(dispatcher,ProgressMessage('firstSlide',slides));
   ```

4 Add code that deletes the listener after the code that generates the presentation.

   ```
   delete(l);
   ```

This presentation uses this progress message.

```
import mlreportgen.ppt.*;
pre = Presentation('myPresentation.pptx');

dispatcher = MessageDispatcher.getTheDispatcher;
l = addlistener(dispatcher,'Message', ...
      @(src, evtdata) disp(evtdata.Message.formatAsText));


dispatch(dispatcher,ProgressMessage('starting presentation',pre));
open(pre);

titleText = Text('This is a Title');
titleText.Style = {Bold};

replace(pre,'Title',titleText);

close(pre);

delete(l);
```

See Also

Functions

mlreportgen.ppt.MessageDispatcher.dispatch | mlreportgen.ppt.MessageDispatcher.getTheDispatcher | mlreportgen.ppt.ProgressMessage.formatAsHTML | mlreportgen.ppt.ProgressMessage.formatAsText | mlreportgen.ppt.ProgressMessage.passesFilter

Classes

mlreportgen.ppt.DebugMessage | mlreportgen.ppt.ErrorMessage | mlreportgen.ppt.MessageDispatcher | mlreportgen.ppt.MessageEventData | mlreportgen.ppt.MessageFilter | mlreportgen.ppt.ProgressMessage | mlreportgen.ppt.WarningMessage

Compile a Presentation Program

If the MATLAB Compiler product is installed on your system, you can use it to compile your presentation program. Compiling allows you to share your report generation program with others who do not have MATLAB installed on their systems.

To enable someone who does not have MATLAB installed to run your compiled program, your program must execute this statement before the first line of PPT API code that the program executes to generate a report:

```
makePPTCompilable();
```

Presentation Formatting Approaches

In this section...
“Template Formatting” on page 12-21
“Format Objects” on page 12-21
“Format Properties” on page 12-22
“Interactive Formatting of Slide Content” on page 12-22

With the PPT API, you can use a PowerPoint template and PPT API format objects and properties to specify the appearance of an object. The PPT API supports four approaches for formatting elements of a presentation.

Formatting Approach	Use
Define formatting in the PowerPoint template.	• Applying formatting globally within a presentation • Maintaining consistency across presentations • Extending formatting options that the PPT API provides
Using the PPT API, specify format objects to define a style for a presentation object.	• Formatting a specific presentation element • Specifying multiple format options in one statement • Specifying complicated values such as hexadecimal color values that are used repeatedly in a program • Extending formatting options beyond the ones that format properties of an object provide • Defining a style to use with multiple objects
Using the PPT API, set format properties of a presentation object.	• Specifying one or two basic format options for a specific presentation object • Extending formatting options beyond those options that format properties of an object provide • Specifying one or two basic format options for a specific presentation object

Formatting Approach	Use
In the PowerPoint software, format a generated PPT API.	• Customizing a specific version of a generated presentation • Extending formatting options beyond those options that the format objects provide

Template Formatting

Use templates for applying formatting globally:

- Across a whole presentation (for example, background color of slides)
- To specific kinds of elements in a presentation (for example, slide titles)

Using a PowerPoint template with the PPT API involves creating and formatting template elements such as:

- Slide masters
- Slide layouts
- Placeholders
- Table styles

Using the template to define formatting offers more formatting options than the PPT API provides. Defining formatting in the template allows you to have consistent formatting in any PPT API presentations that use that template.

To format specific content in a specific slide, consider using one of the other approaches. Adding special-case formatting elements in a template can make the template overly complex.

Format Objects

You can define PPT API format objects and use them to specify a formatting style for presentation objects. After you create a presentation object, you can define the `Style` property for that object, using a cell array of format objects. For example:

```
p = Paragraph('Model Highlights');
p.Style = {FontColor('red'),Bold(true)};
```

For many presentation objects, using format objects provides more formatting options than the format properties of the presentation objects. Using format objects can streamline your code: you can combine multiple formatting options in one statement and apply a defined style to multiple presentation objects.

Format Properties

Use format properties of a PPT API presentation element for basic formatting of a specific presentation object.

After you define a presentation object, you can set values for its format properties, using dot notation. For example:

```
p = Paragraph('My paragraph);
p.Bold = true;
```

The formatting applies only to the specific object. If you want to set just one option for a presentation element, using a format property is the simplest approach.

Interactive Formatting of Slide Content

After you generate a PPT API presentation, you can use the PowerPoint software to fine-tune the formatting.

In PowerPoint, you can use all PowerPoint formatting options, including options that you cannot specify with the PPT API, such as animation. Interactive editing of slide content of the generated presentation allows you to customize a specific version of the presentation without impacting future versions of the presentation.

If you use PowerPoint to customize a presentation generated using the PPT API, you lose those customizations when you generate the presentation again. To preserve the interactive formatting of content, save the customized version of the presentation using a different file name.

Related Examples

- "Set Up a PowerPoint Template" on page 12-26
- "Define a Style Using Format Objects" on page 12-43
- "Use Format Properties" on page 12-45

More About

- “Presentation Format Inheritance” on page 12-24
- “Access PowerPoint Template Elements” on page 12-37

Presentation Format Inheritance

The PPT API allows you to use a PowerPoint template and PPT API format objects and properties to format presentation objects. You can combine formatting approaches.

The formatting you specify in a PowerPoint template specifies the default format of presentation content.

You can use a PPT API to format a specific presentation object. You can:

- Define format objects that you can use with a presentation object `Style` property.
- Specify a value for a format property of a presentation object.

You can combine formatting with the `Style` property and formatting with format properties. For example:

```
p = Paragraph('This is a paragraph');
p.Style = {Bold(true),Underline('wavy')};
p.FontColor = 'red';
```

If you define the same formatting characteristic using each approach, the PPT API uses the specification that appears later in the code. For example, this code specifies blue as the default color for text in a paragraph:

```
p = Paragraph('This is a paragraph');
p.Style = {FontColor('red')};
p.FontColor = 'blue';
```

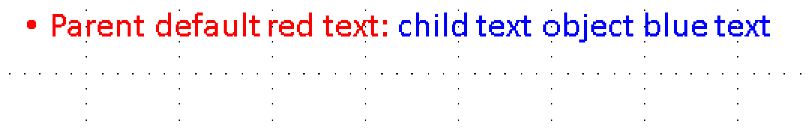
Several PPT API objects are hierarchical. For example:

- You can append a `Text` object to a `Paragraph` object.
- You append `TableEntry` objects to a `TableRow` object, and you can append `TableRow` objects to a `Table` object.

The formatting for a parent object applies to its child objects. However, formats specified by the child object override the parent formatting. For example:

```
import mlreportgen.ppt.*;

slidesFile = 'myParagraphPresentation.pptx';
slides = Presentation(slidesFile);
```

```
slide1 = add(slides,'Title and Content');

%% Use Unicode for special characters
p = Paragraph('Parent default red text: ');
p.FontColor = 'red';

t = Text('child text object blue text');
t.FontColor = 'blue';

append(p,t);
add(slide1,'Content',p);

close(slides);
```



- Parent default red text: child text object blue text

Set Up a PowerPoint Template

In this section...

Use Existing Presentations as Templates

When you use an existing PowerPoint presentation as a template for a PPT API presentation, the content from the template presentation appears in the new PPT API presentation. You can use the PPT API to update content in the existing presentation. You can also programmatically change some formatting of the content that you are updating.

To format a PPT API presentation that you create completely programmatically, specify an empty PowerPoint presentation as a template when you create a `Presentation` object.

Customize a Copy of the Default Template

You can use the default PPT API PowerPoint template as a starting point for a your own template.

Note: You can use a similar approach to customize a PowerPoint template other than the default PPT API template. To do so, when you create a `Presentation` object, specify the template that you want to customize.

1. In a PPT API program, create an empty `Presentation` object, without specifying a template. The PPT API uses the default PowerPoint template.
2. Generate the presentation.

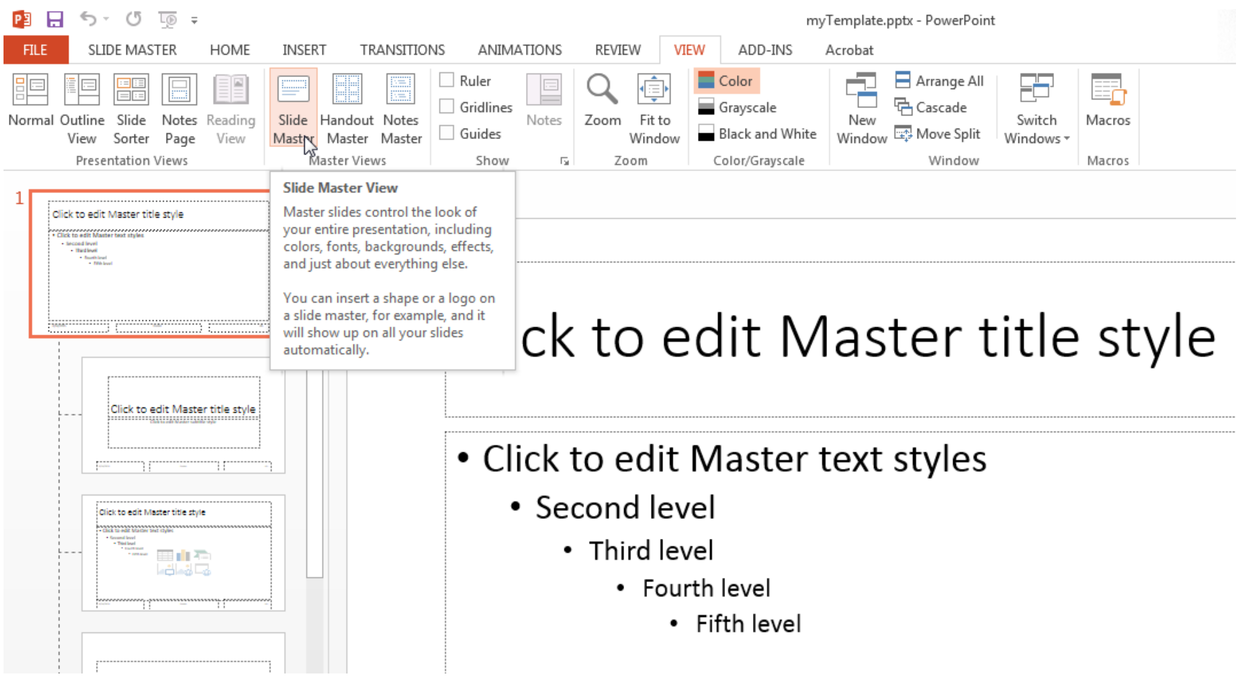
3. Open the presentation and make changes to the template elements.
4. Save the presentation using a different name. Using a different name prevents you from overwriting it with the default template.
5. Use the new template with a PPT API presentation. For example, if the customized template is called `myTemplate`, then use `myTemplate` when you create a PPT API presentation:

   ```
   newPresentation = Presentation('mySecondPresentation','myTemplate');
   ```

Global Presentation Formatting Using a Slide Master

To specify formatting to apply throughout a presentation, use a slide master. The formatting in a slide master is the default formatting for all its child slide layouts.

1. In PowerPoint, open a template or a presentation that you want to use as a template.
2. In the **View** tab, in the **Master Views** section, click **Slide Master**. For example, using the default PPT API template:



Slide Master View

Master slides control the look of your entire presentation, including colors, fonts, backgrounds, effects, and just about everything else.

You can insert a shape or a logo on a slide master, for example, and it will show up on all your slides automatically.

ck to edit Master title style

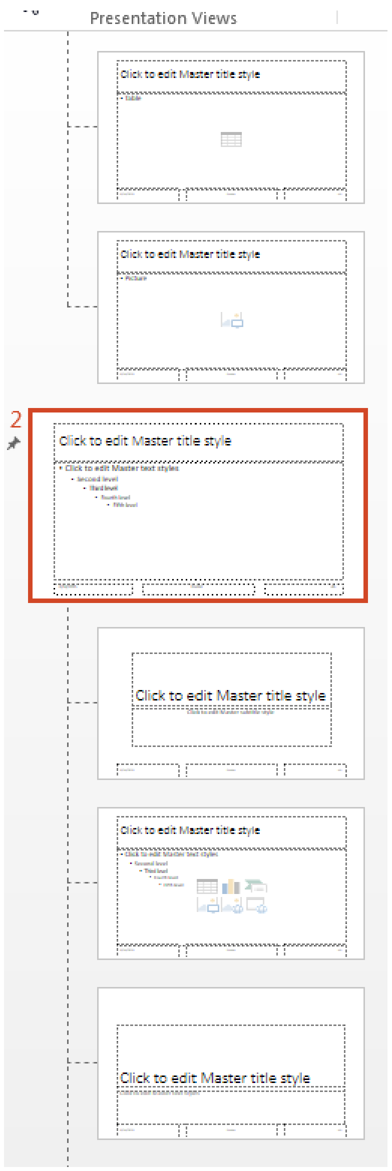
- Click to edit Master text styles
  - Second level
    - Third level
      - Fourth level
        - Fifth level

3. In a slide master, click in a placeholder. For example, in the master title slide, click in `Click to edit Master title style` text and select a formatting option, such as changing the font color to red.
4. Save the template.

Add a Slide Master

You can add a slide master to a PowerPoint template. Adding a slide master is useful for providing different formatting for different parts of a presentation.

1. Interactively open the PowerPoint template.
2. In the **View** tab, in the **Master Views** section, click **Slide Master**.
3. In the slide master and layout pane, click after the last slide layout.
4. Right-click and select **Insert Slide Master**. A new slide master appears, with a copy of the slide layouts under it.


Presentation Views
Click to edit Master title style
Table
Click to edit Master title style
Picture
2
Click to edit Master title style
Click to edit Master text styles
Second level
Third level
Fourth level
Fifth level
Click to edit Master title style
Click to edit Master title style
Click to edit Master text styles
Second level
Third level
Fourth level
Fifth level
Click to edit Master title style

5 Format the new slide master.

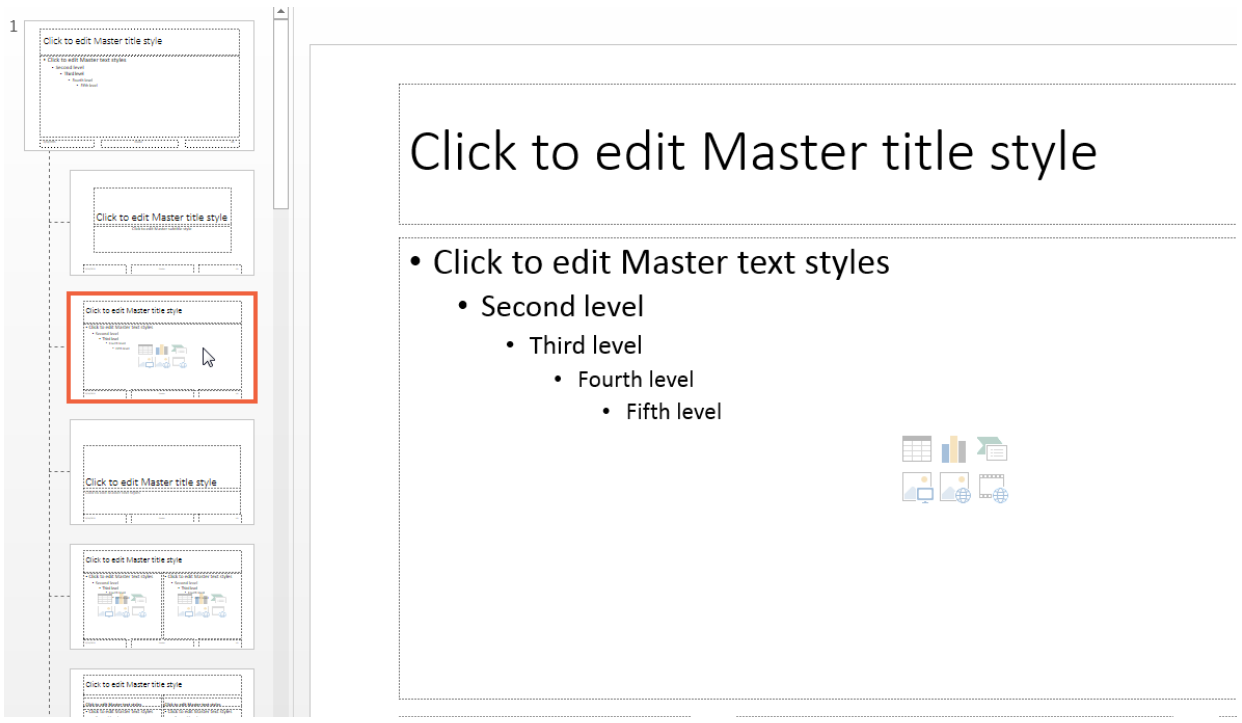
6. Give the slide master a meaningful name. (By default PowerPoint names new masters `Custom Design`, `1_Custom Design`, `2_Custom Design`, and so on.) In the **Slide Master** tab, in the **Edit Master** section, click **Rename** and follow the prompts.
7. Save the template.

Format a Slide Layout

To specify formatting to apply to a specific kind of slide, use a slide layout.

1. In PowerPoint, open a template or a presentation that you want to use as a template.
2. In the **View** tab, in the **Master Views** section, click **Slide Master**.
3. From the slide masters and layout pane, select the slide layout whose formatting you want to change. For example, in the default PPT API PowerPoint template, click the `Title and Content` slide layout.

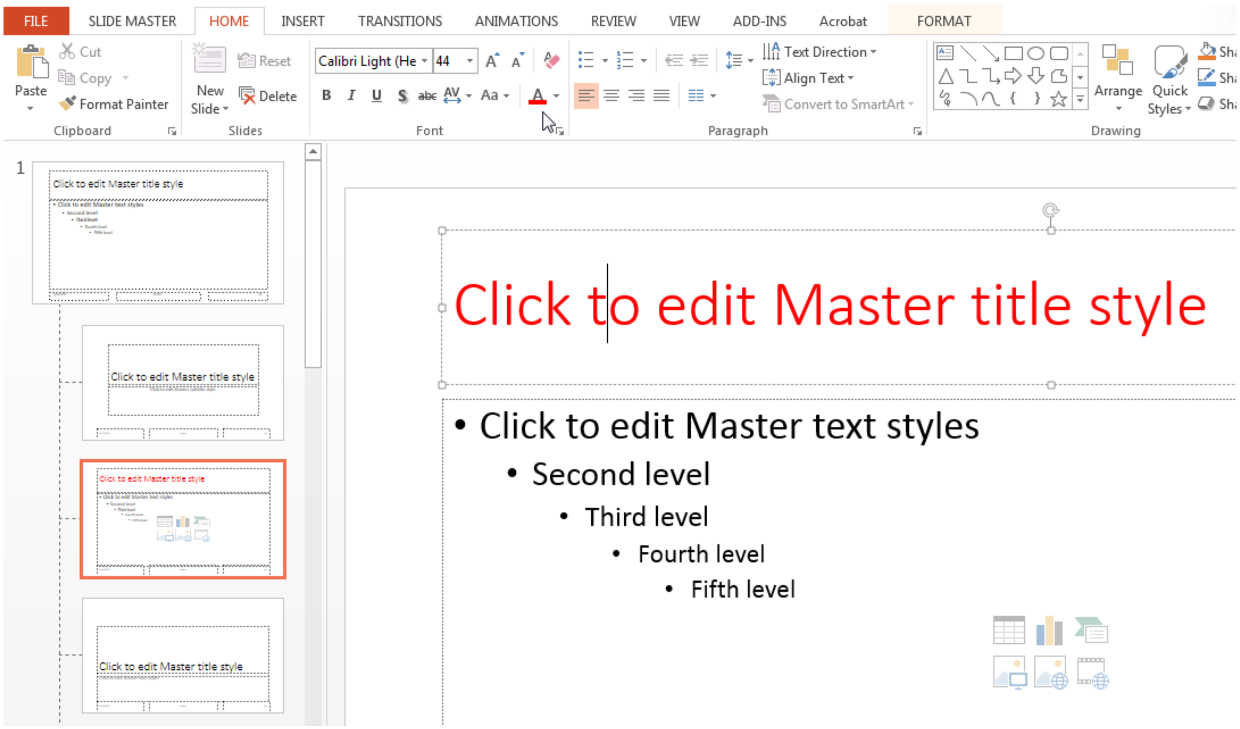
Tip To see the name of a slide layout, hover over that layout. A tooltip appears with the name of the slide layout and the number of slides that use that slide layout.



Click to edit Master title style

- Click to edit Master text styles
  - Second level
    - Third level
      - Fourth level
        - Fifth level

4 In a slide master, click in a placeholder whose formatting you want to change. For example, in the default PPT API template, in the `Title and Content` slide layout, click in `Click to edit Master title style`. Select a formatting option, such as changing the font color to red. The change applies to the title of that slide layout, but not to the title of other slide layouts.



5 Save the template.

Add a Slide Layout

You can add a slide layout to a PowerPoint template.

1 Interactively open the PowerPoint template that you want to modify.

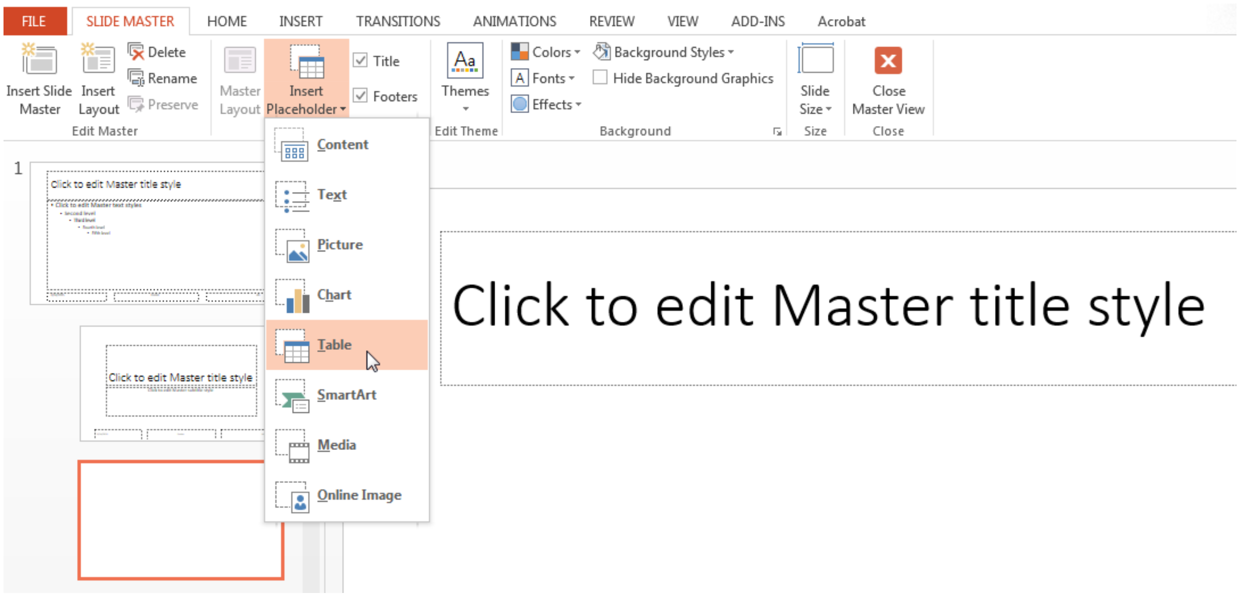
2 In the **View** tab, in the **Master Views** section, click **Slide Master**.

3 In a slide layout, right-click and select **Insert Layout**. A new slide layout appears, with a title placeholder.

Tip To create a slide layout based on an existing slide layout, right-click in the slide layout that you want to base the layout on. Then select **Duplicate Layout**.

---

4 Customize the layout. For example, you can change the font for an existing placeholder or add a placeholder, such as a table placeholder. You can interactively set the location and size of the table placeholder. To remove or add title and footers, use the **Title** and **Footers** check boxes in the **Slide Master** tab.



5 Give the slide layout a meaningful name. (By default PowerPoint names new layouts `Custom Layout`, `1_Custom Layout`, `2_Custom Layout`, and so on.) In the **Slide Master** tab, in the **Edit Master** section, click **Rename** and follow the prompts.

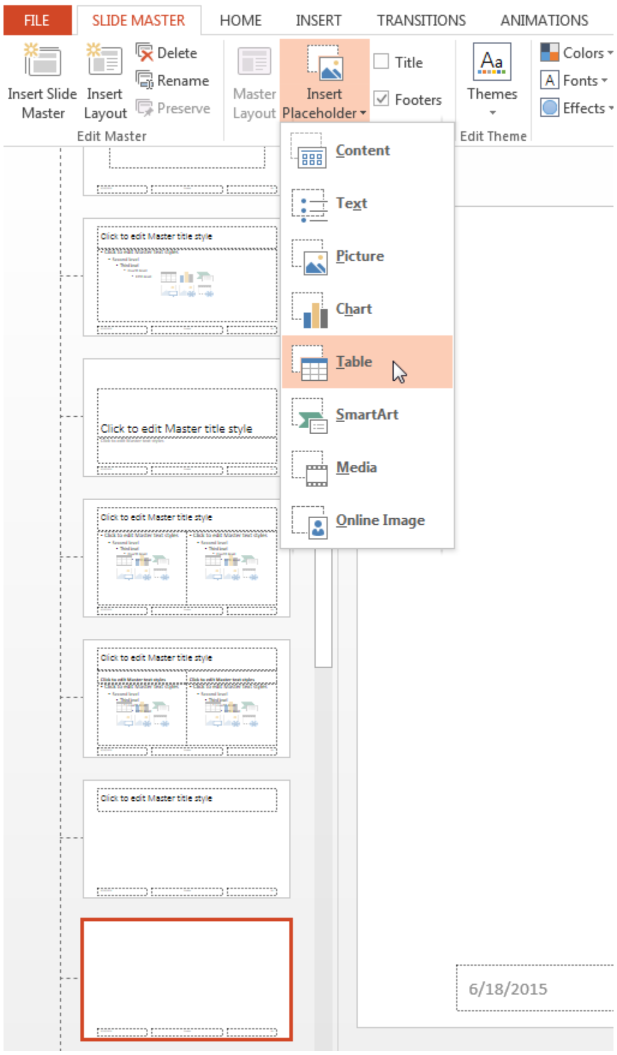
6 Save the template.

Add a Placeholder

You can add any type of placeholder to any slide layout. However, using the PPT API, you can replace this subset of placeholders:

- `Content`
- `Text`
- `Picture`
- `Table`

1 Interactively open the PowerPoint template that you want to modify.
2 In the **View** tab, in the **Master Views** section, click **Slide Master**.
3 In the slide layout pane, select the slide layout to add the placeholder to.
4 In the **Slide Master** tab, in the **Master Layout** section, click **Insert Placeholder** and select the type of placeholder from the list. For example, in the default PPT API template, add a `Table` placeholder to the `Blank` slide layout.



5 In the slide layout, size and position the placeholder.

6 Name the placeholders that you want to use when you add or replace content with the PPT API. To name a placeholder, first display the **Selection** pane. On the **Home** tab, in the **Editing** section, select **Select > Selection Pane**. In the **Selection** pane, click the placeholder name and type a new one.

7 Save the template.

Related Examples

- "Access PowerPoint Template Elements" on page 12-37

More About

- "Presentation Formatting Approaches" on page 12-20

Access PowerPoint Template Elements

In this section...

PPT API Applications and PowerPoint Templates

The PPT API uses PowerPoint presentations as templates to generate presentations. The template can be an empty presentation or a presentation with slides.

You can use the following as templates for a PPT API presentation:

- The default PPT API PowerPoint template
- An existing PowerPoint presentation whose content you want to update
- A PowerPoint template

Templates allow you to specify the fixed content and default layout and appearance of the slides in your presentations. Your MATLAB program can use the PPT API to override the default layout and format of specific slides.

The PPT API comes with a default template that you can use to create presentations. If the default template does not meet your needs, you can use PowerPoint interactively to create templates that do meet your needs.

Template Elements

PowerPoint templates include several elements that the PPT API uses to generate a presentation. To customize formatting defined in a template, modify one or more of these template elements.

PowerPoint Template Element	Purpose
Slide masters	Applies the slide master formatting globally to the presentation. Specifies a layout and formats common to a set of slide layouts

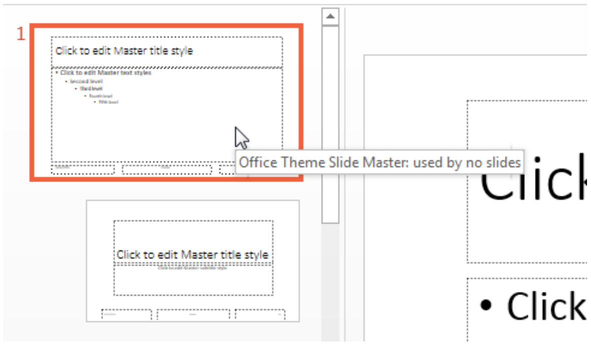
PowerPoint Template Element	Purpose
Slide layouts	Specifies a variant of a slide master layout.
Table styles	Specifies the default appearance of a table. PowerPoint defines a standard set of table styles. You cannot modify these styles but you can use the PPT API to apply these styles to tables you create and override the styles for particular tables.
Placeholders	Specifies an area of a slide layout that you can replace with a text string, list, picture, table, or other content. Every placeholder has a name. You can use PowerPoint interactively to assign a name to a placeholder. You can then use the name in your PPT program to replace the placeholder with content.

View and Change Slide Master Names

A PowerPoint template can have more than one slide master. A slide master can have a child slide layout that has the same name as a child slide layout in another slide master. When you use the PPT API, if the template has multiple slide masters, you need to know the name of the slide master so that you can specify the correct slide layout. You can find out the name in PowerPoint or using the API.

You can rename a master to identify its purpose. You can rename a slide master only in PowerPoint.

1 In PowerPoint, select **View** > **Slide Master**.
2 In the slide layout pane, hover over the slide master. Slide masters are numbered and at the top level in the tree hierarchy. A tooltip displays the name. In this figure, `Office Theme` is the name to use in the API. Do not include the string `Slide Master`.


1
Click to edit Master title style
Office Theme Slide Master: used by no slides
Click to edit Master title style
Click
• Click

3 If you want to rename the master, from the **Slide Master** tab, in the **Edit Master** section, click **Rename** and follow the prompts.

To see slide master names using the PPT API, use the `getMasterNames` method with an `mlreportgen.ppt.Presentation` object. This example uses the default PPT API PowerPoint template, which has one slide master.

```
import mlreportgen.ppt.*;
slides = Presentation('myPresentation');
getMasterNames(slides);
```

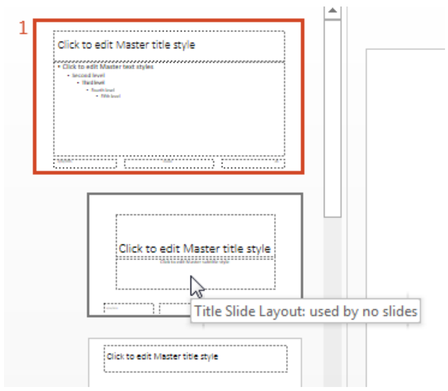
```
ans =

    'Office Theme'
```

View and Change Slide Layout Names

You need to know the name of slide layouts in a PowerPoint template to add a slide using the PPT API. You can find out the slide layout name in PowerPoint and using the API.

When you add a slide layout, you can rename it to identify its purpose. You can rename a slide layout only in PowerPoint.

1 In PowerPoint, select **View** > **Slide Master**.
2 In the slide layout pane, hover over a slide layout under a slide master. A tooltip displays the name of the slide layout. In this figure, `Title Slide` is the name to use in the API. Do not include the string `Layout` .


1
Click to edit Master title style
Click to edit Master title style
Title Slide Layout: used by no slides
Click to edit Master title style

3 If you want to rename the slide layout, from the **Slide Master** tab, in the **Edit Master** section, click **Rename** and follow the prompts.

To see slide layout names using the PPT API, use the `Presentation.getLayoutNames` method. You need to get the slide master name before you get the layout names. The PPT API returns slide masters as a cell array. This example uses the default PPT API PowerPoint template to get the slide layouts from the first master in the template.

```
import mlreportgen.ppt.*;
slides = Presentation('myPresentation');
masters = getMasterNames(slides);

layouts = getLayoutNames(slides,masters{1});
layouts

Columns 1 through 5

    'Title Slide' 'Title and Vertica…'  'Vertical Title an…'  'Title and Table'  'Title

  Columns 6 through 11

    'Title and Content'  'Section Header'  'Two Content'  'Comparison'  'Title Only'

  Columns 12 through 13

    'Content with Capt…'  'Picture with Capt…'
```

View and Change Placeholder and Content Object Names

You need to know placeholder names to use the PPT API to replace placeholders with content. You can find out a placeholder name using PowerPoint or using the PPT API.

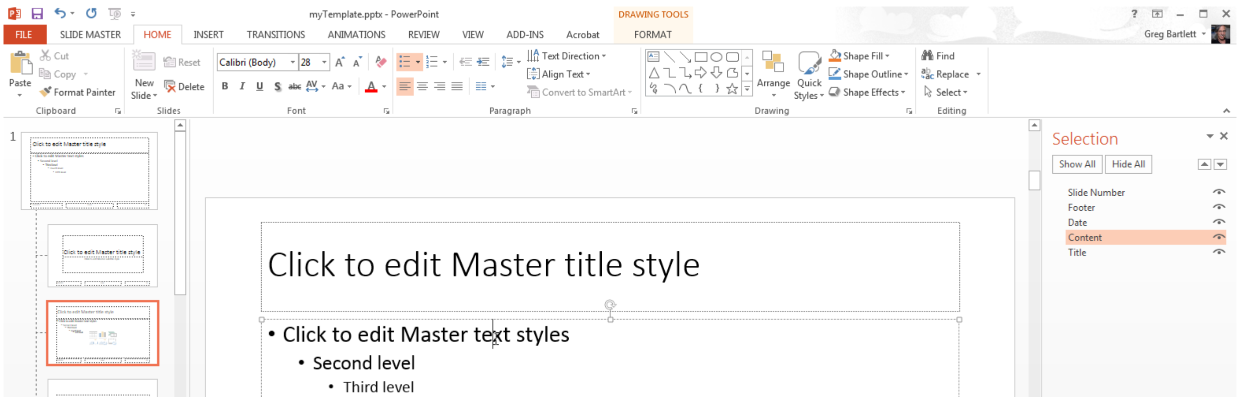
You can rename a placeholder to identify its purpose.

1 In PowerPoint, select **View** > **Slide Master**.

2 In the **Home** tab, in the **Editing** section, select **Select** > **Selection Pane**.

3 In the slide layout pane, select the layout that contains the content placeholder whose name you want to see. The names of the placeholders used in the slide layout appear in the **Selection** pane. Click in a content placeholder to highlight the name in the selection pane.

   The figure shows that the name of the content placeholder in the `Title and Content` slide layout is `Content`.



4 If you want to rename the placeholder, click the name in the **Selection** pane and type a new one.

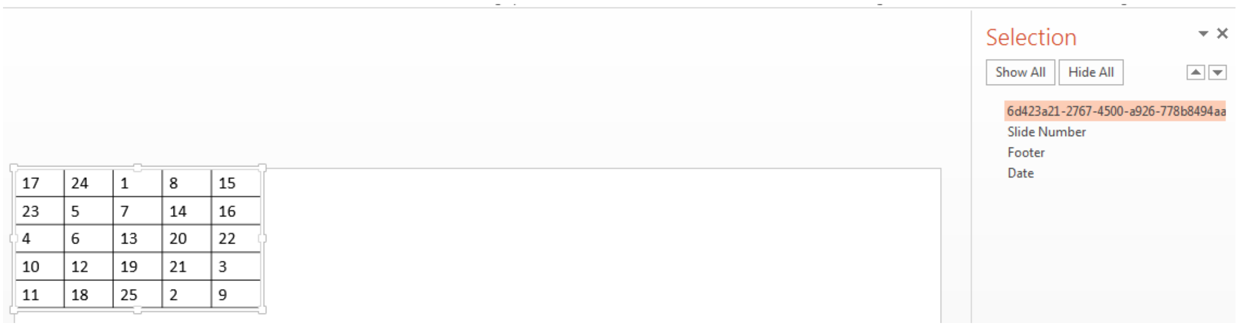
If you update content in a PowerPoint presentation, to see the name of content objects on that slide, also use the **Selection Pane**. For example:

1 Create and generate a presentation with a slide that has a table.

```
import mlreportgen.ppt.*

slidesFile = 'myTablePresentation.pptx';
```

```
slides = Presentation(slidesFile);

slide1 = add(slides,'Blank');
add(slide1,Table(magic(5)));

close(slides);

if ispc
    winopen(slidesFile);
end
```

2 In PowerPoint, display the **Selection** pane. The name of the table is a generated string of characters. You can rename it and use the new name with the PPT API.



17	24	1	8	15
23	5	7	14	16
4	6	13	20	22
10	12	19	21	3
11	18	25	2	9

Related Examples

- "Set Up a PowerPoint Template" on page 12-26

More About

- "Presentation Formatting Approaches" on page 12-20

Define a Style Using Format Objects

A format object is a MATLAB program entity that defines the properties and functions of a specific type of presentation format, such as the weight for text (bold or regular). The PPT API provides a set of constructors for creating several format objects, including:

- `mlreportgen.ppt.Bold` objects
- `mlreportgen.ppt.Italic` objects
- `mlreportgen.ppt.Strike` objects
- `mlreportgen.ppt.Underline` objects
- `mlreportgen.ppt.FontColor` objects

Most PPT API presentation element objects, such as `Text` objects, include a `Style` property that you can set to a cell array of format objects that defines the appearance of the object. For example, to specify the default format for text in a paragraph is red bold text.

```
p = Paragraph('Model Highlights');
p.Style = {FontColor('red'),Bold(true)};
```

You can assign the same array of format objects to more than one PPT API presentation element object. This allows you to create a programmatic equivalent of a template style sheet. For example:

```
import mlreportgen.ppt.*;

slides = Presentation('myParaPres');

add(slides,'Title and Content');
add(slides,'Title and Content');

caution = {FontColor('red'),Bold(true)};
p1 = Paragraph('Hardware Requirements');
p1.Style = caution;
p2 = Paragraph('Software Requirements');
p2.Style = caution;

titles = find(slides,'Title');

replace(titles(1),p1);
replace(titles(2),p2);
```

```
close(slides);
```

The PPT API allows you to assign any format object to any presentation object, regardless of whether the format is appropriate for that object type. Format that are not appropriate are ignored.

Related Examples

- “Use Format Properties” on page 12-45
- “Define a Style Using Format Objects” on page 12-43
- “Set Up a PowerPoint Template” on page 12-26

More About

- “Presentation Formatting Approaches” on page 12-20

Use Format Properties

In this section...

Most PPT API presentation objects (such as a `Paragraph` object) include properties that you can use to set the format of the content of an object.

Dot Notation

To work with PPT API object properties, you use dot notation. Using dot notation involves specifying an object (the variable representing the object) followed by a period and then the property name. For example, suppose that you create a `Paragraph` object `para1`.

```
par1 = Paragraph('My paragraph');
```

To specify the `Bold` property for the `para1` object, use:

```
par1.Bold = true;
```

Get the Properties of an Object

To display all the properties of an object that you create, use one of these approaches in MATLAB:

- Omit the semicolon when you create the object.
- Enter the name of the object.

For example, display the properties of the `Paragraph` object `para1`.

```
para1 = Paragraph('My paragraph')
```

```
para1 =

  Paragraph with properties:

           Bold: []
```

```
      FontColor: []
         Italic: []
         Strike: []
      Subscript: []
    Superscript: []
      Underline: []
          Level: []
          Style: []
       Children: [1x1 mlreportgen.ppt.Text]
         Parent: []
            Tag: 'ppt.Paragraph:22'
             Id: '22'
```

To display the value of a specific property, such as the `Bold` property, use dot notation, without a semicolon.

```
par1 = Paragraph('My paragraph');
para.Bold
```

```
ans =

     []
```

Set the Properties of an Object

You can set some PPT API object properties using the object constructor. The PPT API sets other properties. For most PPT API objects, you can change the values of properties that you specified in the constructor. Also, you can specify values for additional properties.

To specify a value for an object property, use dot notation. For example, to set the default for text in the `para1` paragraph to bold:

```
par1 = Paragraph('My paragraph');
para1.Bold = true;
```

For some presentation objects, you can use the `Style` property to specify formatting options that are not available in the other properties of the object. For example, a `TableEntry` object does not have a `Bold` property. However, you can specify bold as the default for text in the `TableEntry` by using the `Style` property of the `TableEntry` object.

```
te = tableEntry();
```

```
te.Style = {Bold(true)};
```

Related Examples

- “Define a Style Using Format Objects” on page 12-43
- “Set Up a PowerPoint Template” on page 12-26

More About

- “Presentation Formatting Approaches” on page 12-20

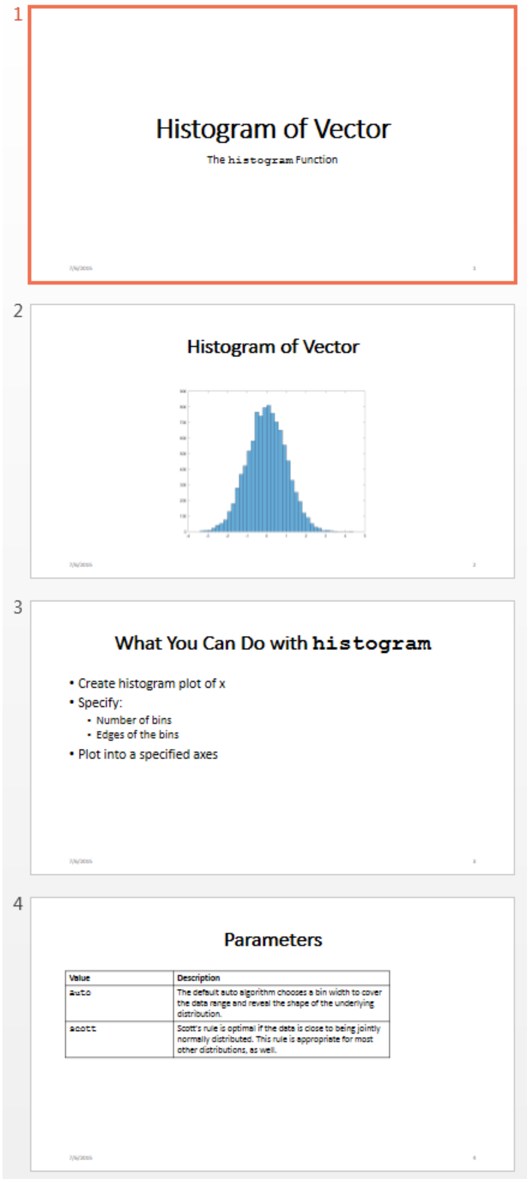
Update Presentation Content Programmatically

In this section...

You can use the PPT API to update content programmatically in an existing PowerPoint presentation.

Generate the Existing Presentation

This example updates content in the PowerPoint presentation `myNewPPTPresentation`. Although you create the presentation programmatically, after you generate it, the presentation is like any other PowerPoint presentation. To generate the presentation, click myNewPPTPresentation program and execute the code in MATLAB. The presentation includes four slides:



Histogram of Vector

The `histogram` Function

Histogram of Vector

What You Can Do with `histogram`

- Create histogram plot of x
- Specify:
  - Number of bins
  - Edges of the bins
- Plot into a specified axes

Parameters

Value	Description
`auto`	The default auto algorithm chooses a bin width to cover the data range and reveal the shape of the underlying distribution.
`scott`	Scott's rule is optimal if the data is close to being jointly normally distributed. This rule is appropriate for most other distributions, as well.

To use the PPT API to update content in an existing PowerPoint presentation programmatically, you:

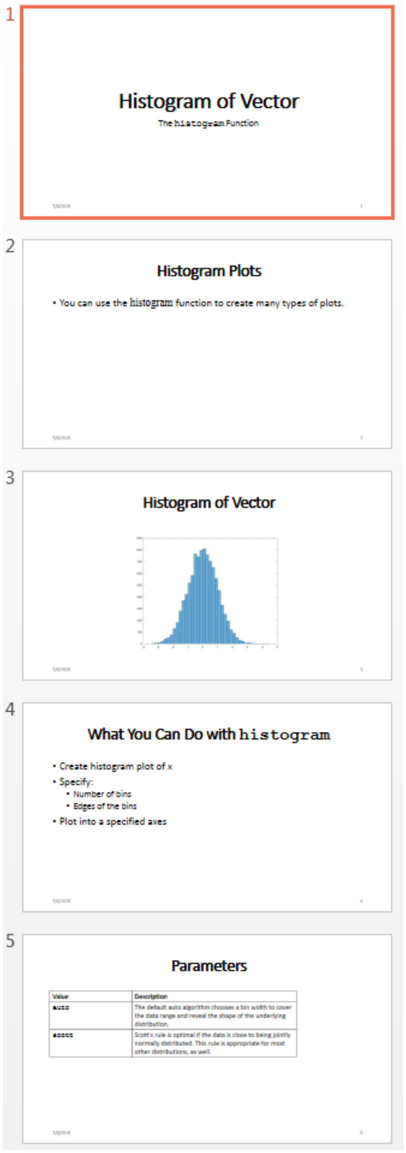
- Set up the PowerPoint presentation by naming content objects that you want to replace. If you want to add new content, insert placeholders in the presentation for that content.
- In MATLAB, import the `mlreportgen.ppt` PPT API package.
- Create a `Presentation` object that uses the existing presentation as the template for updated version.
- Replace any existing slide content that you want to update.
- Add slides any new slides.
- Generate the presentation.

Updates to the Presentation

In this example you use the PPT API to make these changes to the `myNewPPTPresentation` presentation:

- Replace the picture on the second slide.
- Replace the text on the third slide.
- Replace the table on the fourth slide.
- Insert a new slide before the slide with the plot.

Here is the updated presentation.



1

Histogram of Vector

The `histogram` Function

2

Histogram Plots

- You can use the histogram function to create many types of plots.

3

Histogram of Vector

4

What You Can Do with `histogram`

- Create histogram plot of x
- Specify:
  - Number of bins
  - Edges of the bins
- Plot into a specified axes

5

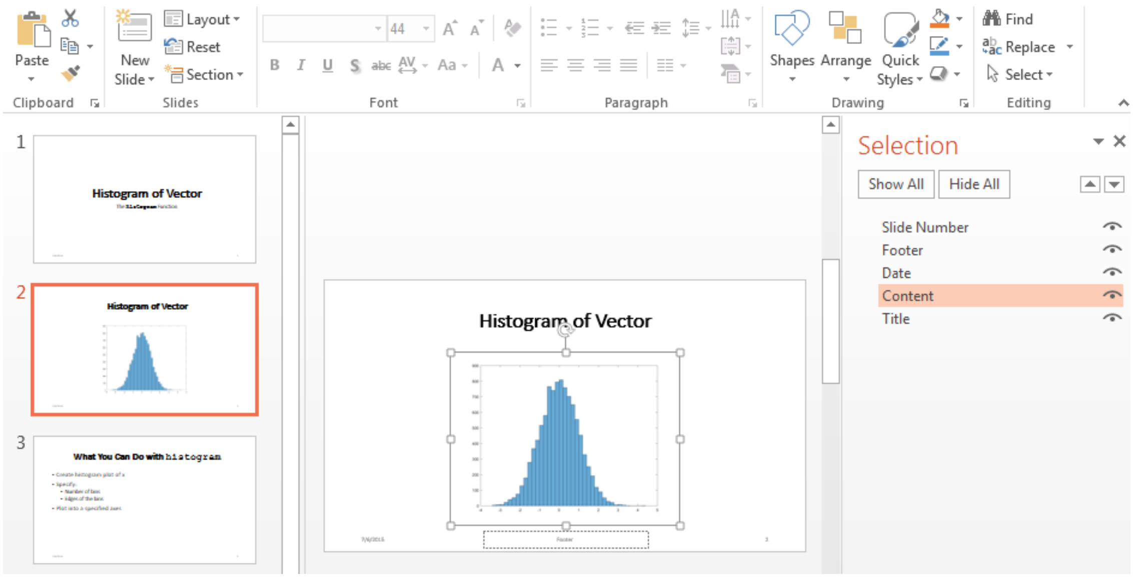
Parameters

Value	Description
`auto`	The default auto algorithm chooses a bin width to cover the data range and reveal the shape of the underlying distribution.
`scott`	Scott's rule is optimal if the data is close to being jointly normally distributed. This rule is appropriate for most other distributions, as well.

Set Up the Existing Presentation

A PPT API program uses a PowerPoint template to generate a presentation. When you update an existing PowerPoint presentation programmatically, use that presentation as the template for the updated presentation. To update content in the `Slide` objects, use the PPT API.

1. Open the `myNewPPTPresentation` presentation. In PowerPoint, click **View** > **Normal**.
2. View the names of content objects in the slides. In the **Home** tab, click **Select** > **Selection Pane**. When you click content in a slide, the **Selection** pane highlights the name of the content object.



3. Rename content objects. In the PowerPoint **Selection** pane, click in the content name box and replace the current name with the name you want. Use these unique names to update content objects.

   - In the second slide, change the `Title` object name to `HistBins` and the `Content` object name to `Histogram`.
   - In the third slide, change `Title` to `RelatedFuncs`. Change `Content` to `FuncList`.

- In the fourth slide, change `Content` to `ParamTable`.

Import the PPT API Package

All PPT API class names include the prefix `mlreportgen.ppt`. To avoid the need to include the prefix in your code, insert this statement at the beginning of a PPT API program.

```
import mlreportgen.ppt.*;
```

Note: The `import` line is the first line in the example program. This example creates a PPT API program in sections and therefore does not show the `import` command. To view the complete program, click myUpdatedPresentation program.

Create the `Presentation` Object

Create a `Presentation` object. Specify:

- `myUpdatedPresentation.pptx` as the output file for the generated presentation.
- `myNewPPTPresentation.pptx` as the PowerPoint template. Use the presentation file that you want to update as the template file.

```
slidesFile = 'myUpdatedPresentation.pptx';
slides = Presentation(slidesFile,'myNewPPTPresentation.pptx');
```

Specifying a different name for the output file preserves the original presentation. If you want to overwrite the existing presentation, you can use the template file name as the file name for the output file.

Replace a Picture

Change the title of the second slide. Create a `Picture` object to replace the existing picture. You can use a `find` method with the `Presentation` object to find content objects named `HistBins` and `Histogram` (the unique names you specified using PowerPoint).

```
histTitle = Paragraph('Histogram with Specified Bin Edges');
replace(slides,'Histogram',histTitle);

x = randn(1000,1);
```

```
edges = [-10 -2:0.25:2 10];
h = histogram(x,edges);
saveas(gcf,'hist_plot.png');

plotEdges = Picture('hist_plot.png');

replace(slides,'HistBins',plotEdges)
```

Replace Text with Links

Change the title of the third slide. Create text to replace the existing text. The text includes links to the MathWorks online documentation. Append `ExternalLink` objects to `Paragraph` objects, and replace the slide content using a cell array of the `Paragraph` objects.

```
funcsTitle = Paragraph('Related Functions');
replace(slides,'RelatedFuncs',funcsTitle);

histCounts = Paragraph();
histCountsLink = ExternalLink...
('http://www.mathworks.com/help/matlab/ref/histcounts.html','histcounts');
append(histCounts,histCountsLink);

fewerbins = Paragraph();
fewerbinsLink = ExternalLink...
('http://www.mathworks.com/help/matlab/ref/fewerbins.html','fewerbins');
append(fewerbins,fewerbinsLink);

replace(slides,'FuncList',{histCounts,fewerbins});
```

Replace a Table

To create a table, create a `Table` object. In the `Table` constructor, you can specify a cell array of values for the table cells. To get bold text for the top row, include `Paragraph` objects as the first three elements of the cell array. Then replace the table.

```
long = Paragraph('Long Name');
long.Bold = true;
short = Paragraph('Short Name');
short.Bold = true;
rgb = Paragraph('RGB triplet');
rgb.Bold = true;
```

```
table2 = Table({long,short,rgb;'yellow','y','[1 1 0]';'green','g','[1 0 1] '});

contents = find(slides,'ParamTable');
replace(slides,'ParamTable',table2);
```

Insert a New Slide

You can use the PPT API to insert a new slide in an existing presentation and you can specify the numerical location of the slide. For example, this code makes a new slide the fifth slide in a presentation.

```
newSlide = add(slides,'Title and Content',5);
```

However, to have a slide precede a specific slide, even if later you add or remove other slides, you can specify a reference slide. To use this approach when updating an existing PowerPoint presentation, use the PPT API to name the reference slide. Use the name of the reference slide when you insert a new slide.

```
slides.Children(2).Name = 'ReferenceSlide';

refSlide = find(slides,'ReferenceSlide');
introSlide = add(slides,'Title and Content',refSlide);

contents = find(introSlide,'Title');
replace(contents(1),'Histogram Plots');

introText = Paragraph('You can use the ');
code = Text('histogram');
code.Font = 'Courier New';
append(introText,code);
append(introText,'  function to create many types of plots.');

contents = find(introSlide,'Content');
replace(contents(1),introText);
```

Generate and Open the Presentation

Generate the PowerPoint presentation. Use a `close` method with a `Presentation` object.

```
close(slides);
```

Open the presentation `myUpdatedPresentation.pptx` file. On a Windows platform, you can open the presentation in MATLAB:

```
if ispc
    winopen(slidesFile);
end
```

Code for `myUpdatedPresentation`

Here is the complete PPT API program to create the `myUpdatedPresentation` presentation.

Note: This code requires that the `myNewPPTPresentation.pptx` file be in your current folder. To generate that presentation, click myNewPPTPresentation program and execute the code in MATLAB. Before you run the code for `myUpdatedPresentation`, be sure that the existing presentation includes the changes described in "Set Up the Existing Presentation" on page 12-52.

```
import mlreportgen.ppt.*;

slidesFile = 'myUpdatedPresentation.pptx';
slides = Presentation(slidesFile,'myNewPPTPresentation.pptx');

histTitle = Paragraph('Histogram with Specified Bin Edges');
replace(slides,'Histogram',histTitle);

x = randn(1000,1);
edges = [-10 -2:0.25:2 10];
h = histogram(x,edges);
saveas(gcf,'hist_plot.png');

plotEdges = Picture('hist_plot.png');

replace(slides,'HistBins',plotEdges)

funcsTitle = Paragraph('Related Functions');
replace(slides,'RelatedFuncs',funcsTitle);

histCounts = Paragraph();
histCountsLink = ExternalLink...
('http://www.mathworks.com/help/matlab/ref/histcounts.html','histcounts');
append(histCounts,histCountsLink);

fewerbins = Paragraph();
```

```
fewerbinsLink = ExternalLink...
('http://www.mathworks.com/help/matlab/ref/fewerbins.html','fewerbins');
append(fewerbins,fewerbinsLink);

replace(slides,'FuncList',{histCounts,fewerbins});

long = Paragraph('Long Name');
long.Bold = true;
short = Paragraph('Short Name');
short.Bold = true;
rgb = Paragraph('RGB triplet');
rgb.Bold = true;

table2 = Table({long,short,rgb;'yellow','y','[1 1 0]'; 'green', 'g','[1 0 1] '});

contents = find(slides,'ParamTable');
replace(slides,'ParamTable',table2);


slides.Children(2).Name = 'ReferenceSlide';

refSlide = find(slides,'ReferenceSlide');
introSlide = add(slides,'Title and Content',refSlide(1));

contents = find(introSlide,'Title')
replace(contents(1),'Histogram Plots');

introText = Paragraph('You can use the ');
code = Text('histogram ');
code.Style = {FontFamily('Courier New')};
append(introText,code);
append(introText,'function to create many types of plots.');

contents = find(introSlide,'Content');
replace(contents(1),introText);

close(slides);
if ispc
    winopen(slidesFile);
end
```

Related Examples

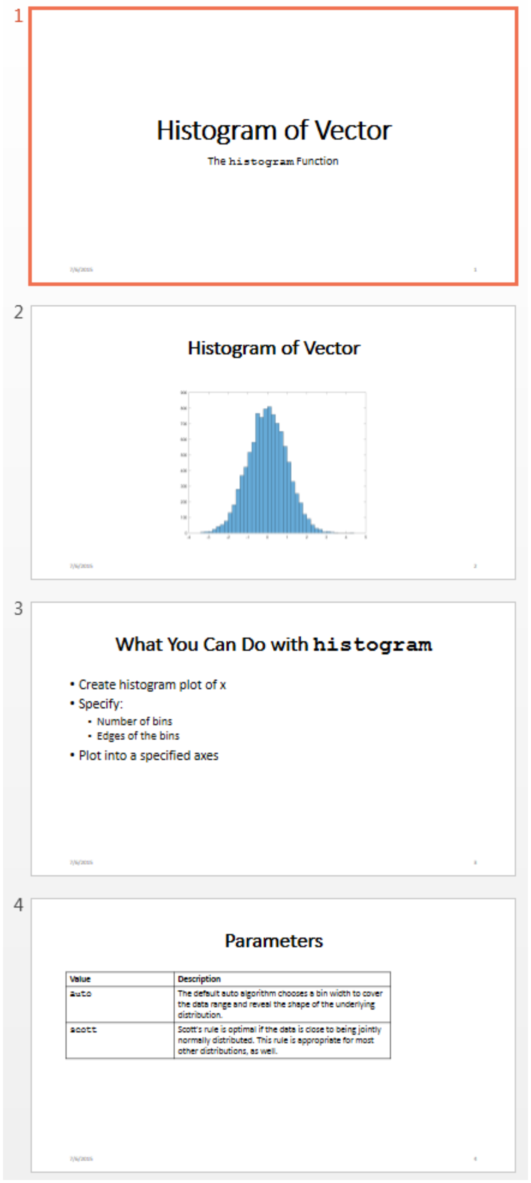
- "Create a Presentation Programmatically" on page 12-59

- "Set Up a PowerPoint Template" on page 12-26
- "Access PowerPoint Template Elements" on page 12-37
- "Add Slides" on page 12-71
- "Create and Format Text" on page 12-81
- "Create and Format Paragraphs" on page 12-84
- "Create and Format Tables" on page 12-87
- "Create and Format Pictures" on page 12-96
- "Create and Format Links" on page 12-98

Create a Presentation Programmatically

In this section...

This presentation example shows some common tasks involved in creating a presentation with the PPT API. This example produces these slides:



1

Histogram of Vector

The `histogram` Function

2

Histogram of Vector

3

What You Can Do with `histogram`

- Create histogram plot of x
- Specify:
  - Number of bins
  - Edges of the bins
- Plot into a specified axes

4

Parameters

Value	Description
`auto`	The default auto algorithm chooses a bin width to cover the data range and reveal the shape of the underlying distribution.
`scott`	Scott's rule is optimal if the data is close to being jointly normally distributed. This rule is appropriate for most other distributions, as well.

To use the PPT API to create a complete PowerPoint presentation programmatically, you:

- Set up an empty PowerPoint presentation as a template for the presentation.
- In MATLAB, import the `mlreportgen.ppt` PPT API package.
- Create a `Presentation` object that contains the presentation code.
- Add slides based on slide layouts in the template.
- Add content to the slides.
- Generate the presentation.

Tip To see another example of a PPT API program in MATLAB, enter `population_slides`.

Set Up a Template

A PPT API program uses a PowerPoint presentation as a template to generate a presentation. When you create a complete presentation programmatically, use an empty template. If slides in the template have content (such as text or tables), the content appears in the presentation that the PPT API program generates.

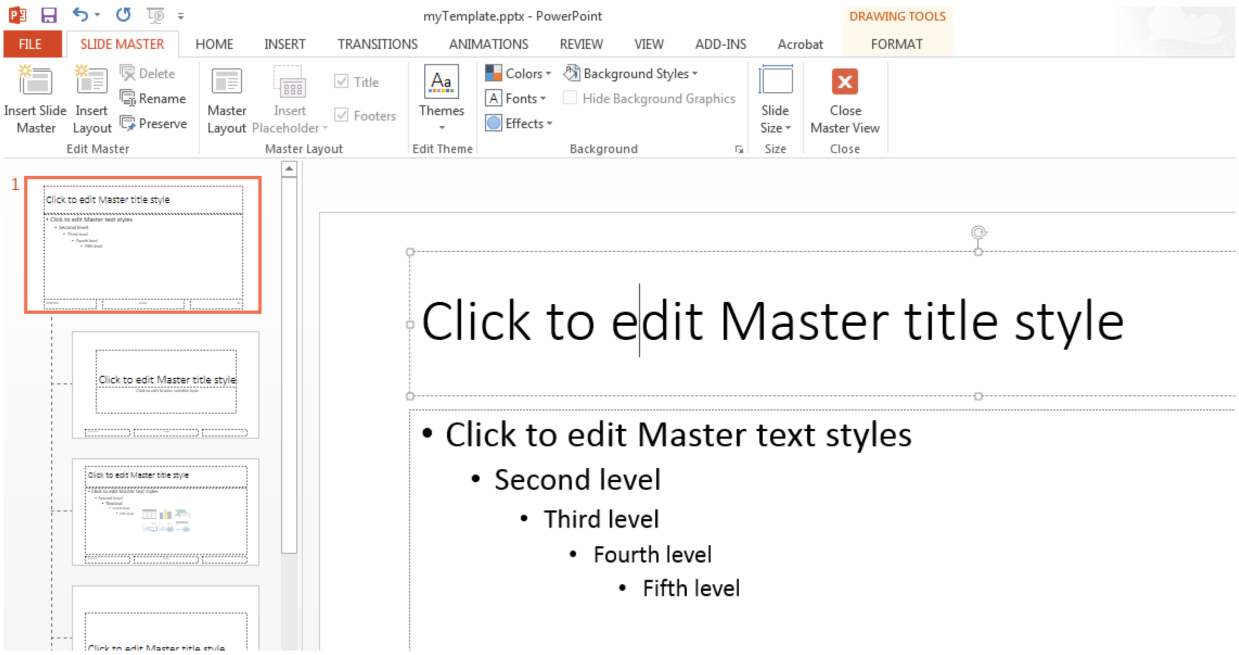
The PPT API provides a default PowerPoint template. You can use the PPT API to make a copy of the default template, which you then can customize to use with your PPT API program. This code creates a template called `myTemplate`, which is a copy of the default PPT API template.

```
import mlreportgen.ppt.*
slidesFile = 'myTemplate.pptx';
slides = Presentation('myTemplate');

open(slides);

close(slides);
```

Open the `myTemplate.pptx` file. On a Windows platform, you can open the presentation in MATLAB:

```
if ispc
    winopen(slidesFile);
end
```

To see template elements, such as the slide master and slide layouts, in PowerPoint **View** pane, click **Slide Master**.

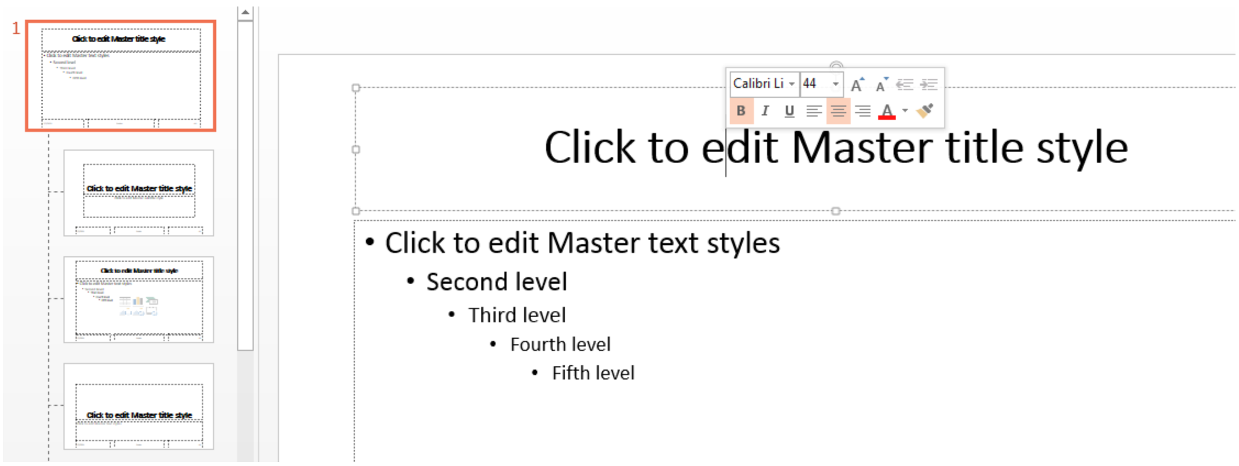


Click to edit Master title style

- Click to edit Master text styles
  - Second level
    - Third level
      - Fourth level
        - Fifth level

Use PowerPoint interactively to customize the template. To set default formatting for the whole presentation, customize a slide master. To set default formatting for a specific kind of slide, customize a slide layout. For example, you can use the slide master to set up the template to use bold text for slide titles.

1. In the slide layout, right-click in `Click to edit Master title style` box.
2. From the context menu, select **B** (bold). Also select the button to center the text.


Calibri Li
44
Click to edit Master title style
• Click to edit Master text styles
• Second level
• Third level
• Fourth level
• Fifth level

3 Save and close the template.

Import the PPT API Package

All PPT API class names include the prefix `mlreportgen.ppt`. To avoid including the package name when you invoke PPT API object constructors and method, import the package. Insert this statement at the beginning of a PPT API program.

```
import mlreportgen.ppt.*;
```

Note: The `import` line is the first line in this example program. This example creates a PPT API program in sections, and so you use the `import` command only once. To view the complete program, click myNewPPTPresentation program.

Create the `Presentation` Object

Create a `Presentation` object. Specify:

- `myNewPPTPresentation.pptx` as the output file for the generated presentation.
- `myTemplate.pptx` as the PowerPoint template.

```
slidesFile = 'myNewPPTPresentation.pptx';
slides = Presentation(slidesFile,'myTemplate');
```

Add a Presentation Title Slide

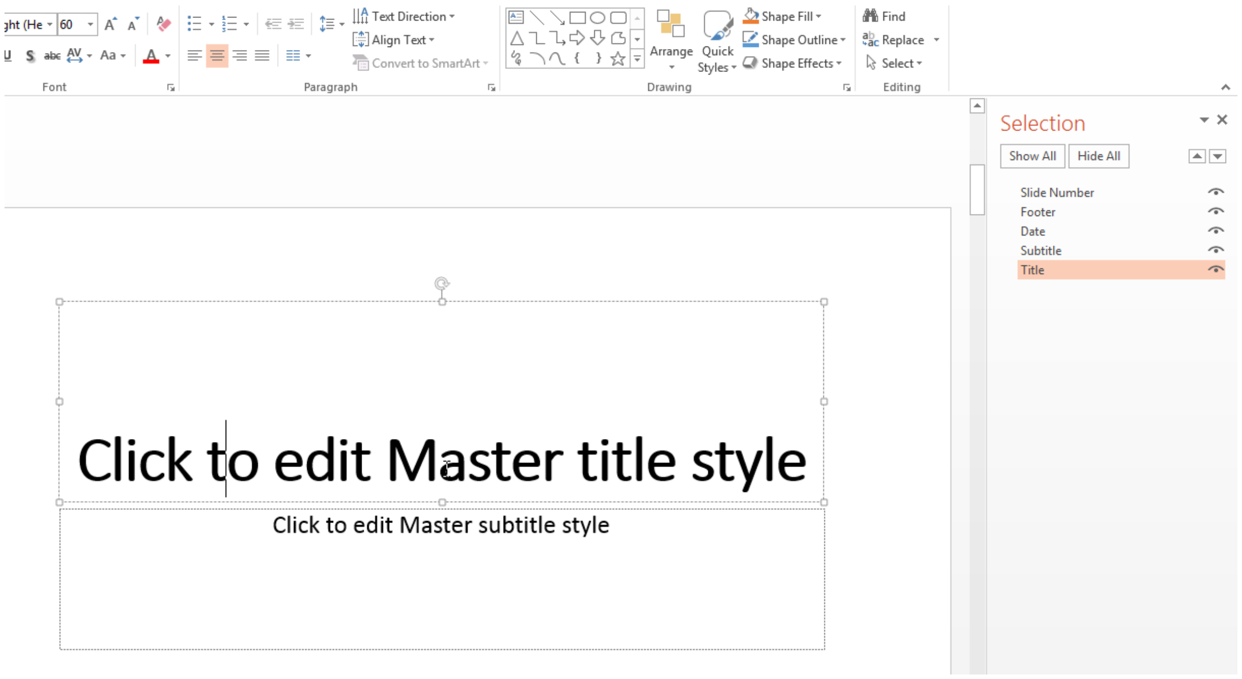
To add a slide programmatically, specify a slide layout in the template. To see the names of the slide layouts, in the PowerPoint **Slide Master** tab, hover over a slide layout.

The `myTemplate` template includes a `Title Slide` slide layout for the presentation title slide. To add a slide using the `Title Slide` layout, use the `add` method with `slides`, which is a `Presentation` object. In the slide layout name, do not include the word `Layout`, which appears at the end of slide layout names when you hover over slide layouts.

```
presentationTitleSlide = add(slides,'Title Slide');
```

To add content to the slide, first find out the names of the content objects in the slide layout.

1 In PowerPoint, stay in the slide master view and select the **Home** tab.
2 Click **Select** > **Selection Pane**.
3 In the slide layout, click the slide layout content item whose name you want.



Specify a title and a subtitle. Specify the slide, the name of the content objects you want to replace, and the text for the title and subtitle. For the subtitle, to specify a different font for the word `histogram`, use a `Paragraph` object for that text.

```
replace(presentationTitleSlide,'Title','Create Histogram Plots');

subtitleText = Paragraph('The ');
funcName = Text('histogram');
funcName.Font = 'Courier New';

append(subtitleText,funcName);
append(subtitleText,' Function');
replace(presentationTitleSlide,'Subtitle1',subtitleText);
```

Add a Slide with a Picture

To add a picture to a slide, create a `Picture` object, specifying an image file. This example creates a MATLAB plot and saves the plot as an image file. You can add the picture to a slide. Use a `Title and Content` slide layout and add a title and picture.

```
x = randn(10000,1);
h = histogram(x);

saveas(gcf,'myPlot_img.png');

plot1 = Picture('myPlot_img.png');

pictureSlide = add(slides,'Title and Content');
replace(slides,'Title','Histogram of Vector');
contents = find(pictureSlide,'Content');
replace(contents(1),plot1);
```

Add a Slide with Text

Depending on the slide layout, PowerPoint formats the text you add as a paragraph, a bulleted list, or a numbered list. This example creates another instance of a `Title and Content` slide, which formats the text as a bulleted list. You can use a nested cell array to specify levels for bullets.

```
textSlide = add(slides,'Title and Content');

titleText2 = Paragraph('What You Can Do with ');
func = Text('histogram');
```

```
func.Font = 'Courier New';
append(titleText2,func);
contents = find(textSlide,'Title');
replace(contents(1),titleText2);

contents = find(textSlide,'Content');
replace(contents(1),{'Create histogram plot of x',...
'Specify:',{'Number of bins','Edges of the bins'},...
'Plot into a specified axes'});
```

Add a Slide with a Table

You can use several approaches to add a table to a slide. This example shows how to build a table row by row.

- Create a `Table` object.
- Create a `TableRow` object for each row of the table.
- Create `TableEntry` objects and append them to table rows.
- Add the table to a slide.

```
tableSlide = add(slides,'Title and Content');
contents = find(tableSlide,'Title');
titleText3 = Paragraph('Parameters');
replace(contents(1),titleText3);

paramTable = Table();
colSpecs(2) = ColSpec('6in');
colSpecs(1) = ColSpec('3in');
paramTable.ColSpecs = colSpecs;

tr1 = TableRow();
tr1.Style = {Bold(true)};

tr1te1Text = Paragraph('Value');
tr1te2Text = Paragraph('Description');
tr1te1 = TableEntry();
tr1te2 = TableEntry();
append(tr1te1,tr1te1Text);
append(tr1te2,tr1te2Text);
append(tr1,tr1te1);
append(tr1,tr1te2);

tr2 = TableRow();
```

```
tr2te1Text = Paragraph('auto');
tr2te1Text.Font = 'Courier New';
tr2te2Text = Paragraph('The default auto algorithm chooses a bin width to cover ');
append(tr2te2Text,'the data range and reveal the shape of the underlying distribution.
tr2te1 = TableEntry();
tr2te2 = TableEntry();
append(tr2te1,tr2te1Text);
append(tr2te2,tr2te2Text);
append(tr2,tr2te1);
append(tr2,tr2te2);

tr3 = TableRow();
tr3te1Text = Paragraph('scott');
tr3te1Text.Font = 'Courier New';
tr3te2Text = Paragraph(' is optimal if the data is close ');
append(tr3te2Text,'to being jointly normally distributed. This rule is ');
append(tr3te2Text,'appropriate for most other distributions, as well.');
tr3te1 = TableEntry();
tr3te2 = TableEntry();
append(tr3te1,tr3te1Text);
append(tr3te2,tr3te2Text);
append(tr3,tr3te1);
append(tr3,tr3te2);

append(paramTable,tr1);
append(paramTable,tr2);
append(paramTable,tr3);

contents = find(tableSlide,'Content');
replace(contents(1),paramTable);
```

Generate and Open the Presentation

Generate the PowerPoint presentation. Use a `close` method with a `Presentation` object.

```
close(slides);
```

Open `myNewPPTPresentation.pptx`. On a Windows platform, you can open it in MATLAB:

```
if ispc
    winopen(slidesFile);
end
```

Code for `myNewPPTPresentation`

Here is the complete PPT API program to create `myNewPPTPresentation`.

Note: The `myTemplate.pptx` file must be in the current folder. If it is not, see “Set Up a Template” on page 12-61.

```
import mlreportgen.ppt.*;

slidesFile = 'myNewPPTPresentation.pptx';
slides = Presentation(slidesFile,'myTemplate');

%Add a title slide
presentationTitleSlide = add(slides,'Title Slide');
replace(presentationTitleSlide,'Title','Create Histograms Plots');

subtitleText = Paragraph('The ');
funcName = Text('histogram');
funcName.Font = 'Courier New';
>> append(subtitleText,funcName);
append(subtitleText,' Function');
replace(presentationTitleSlide,'Subtitle',subtitleText);

%Add a picture slide
x = randn(10000,1);
h = histogram(x);

saveas(gcf,'myPlot_img.png');

plot1 = Picture('myPlot_img.png');

pictureSlide = add(slides,'Title and Content');
replace(slides,'Title','Histogram of Vector');
contents = find(pictureSlide,'Content');
replace(contents(1),plot1);

%Add a text slide
textSlide = add(slides,'Title and Content');

titleText2 = Paragraph('What You Can Do with ');
func = Text('histogram');
func.Font = 'Courier New';
```

```
append(titleText2,func);
contents = find(textSlide,'Title');
replace(contents(1),titleText2);

contents = find(textSlide,'Content');
replace(contents(1),{'Create histogram plot of x',...
'Specify:',{'Number of bins','Edges of the bins'},...
'Plot into a specified axes'});

%Add a table slide
tableSlide = add(slides,'Title and Content');
contents = find(tableSlide,'Title');
titleText3 = Paragraph('Parameters');
replace(contents(1),titleText3);

paramTable = Table();
paramTable = Table();
colSpecs(2) = ColSpec('6in');
colSpecs(1) = ColSpec('3in');
paramTable.ColSpecs = colSpecs;

tr1 = TableRow();
tr1.Style = {Bold(true)};

tr1te1Text = Paragraph('Value');
tr1te2Text = Paragraph('Description');
tr1te1 = TableEntry();
tr1te2 = TableEntry();
append(tr1te1,tr1te1Text);
append(tr1te2,tr1te2Text);
append(tr1,tr1te1);
append(tr1,tr1te2);

tr2 = TableRow();
tr2te1Text = Paragraph('auto');
tr2te1Text.Font = 'Courier New';
tr2te2Text = Paragraph('The default auto algorithm chooses a bin width to ');
append(tr2te2Text,'cover the data range and reveal the shape of the underlying distribu
tr2te1 = TableEntry();
tr2te2 = TableEntry();
append(tr2te1,tr2te1Text);
append(tr2te2,tr2te2Text);
append(tr2,tr2te1);
append(tr2,tr2te2);
```

```
tr3 = TableRow();
tr3te1Text = Paragraph('scott');
tr3te1Text.Font = 'Courier New';
tr3te2Text = Paragraph('Scott''s rule is optimal if the data is close ');
append(tr3te2Text,'to being jointly normally distributed. This rule is ');
append(tr3te2Text,'appropriate for most other distributions, as well.');
tr3te1 = TableEntry();
tr3te2 = TableEntry();
append(tr3te1,tr3te1Text);
append(tr3te2,tr3te2Text);
append(tr3,tr3te1);
append(tr3,tr3te2);

append(paramTable,tr1);
append(paramTable,tr2);
append(paramTable,tr3);

contents = find(tableSlide,'Content');
replace(contents(1),paramTable);

%Generate and open the presentation
close(slides);

if ispc
    winopen(slidesFile);
end
```

Related Examples

- “Update Presentation Content Programmatically” on page 12-48
- “Set Up a PowerPoint Template” on page 12-26
- “Access PowerPoint Template Elements” on page 12-37
- “Add Slides” on page 12-71
- “Create and Format Text” on page 12-81
- “Create and Format Paragraphs” on page 12-84
- “Create and Format Tables” on page 12-87
- “Create and Format Pictures” on page 12-96
- “Create and Format Links” on page 12-98

Add Slides

In this section...

To add a slide to a presentation, use the PPT API to add slide based on a slide layout defined in the PowerPoint presentation template. If the template does not include slide layout that meets your requirements, you can add a slide layout. For details, see “Add a Slide Layout” on page 12-32.

To add a slide, use the `add` method with an `mlreportgen.ppt.Presentation` object. For example, using the default PPT API template, you can add a slide using the `Title and Content` slide layout.

```
import mlreportgen.ppt.*;
slides = Presentation('myPresentation');
slide1 = add(slides,'Title and Content');
```

When you add a slide, the PPT API creates an `mlreportgen.ppt.Slide` object. However, you cannot add a slide by using a `Slide` constructor.

Specify the Order of a Slide

By default, the order in which you add slides in a PPT API program determines the order in which the slides appear. For example, this code makes the `titleSlide` slide the first slide in the presentation. The `contentSlide` slide is the second slide.

```
slides = Presentation('myPresentation');
titleSlide = add(slides,'Title Slide');
contentSlide = add(slides,'Title and Content');
```

When you add a slide, to specify explicitly the order in which it appears, you can:

- Specify the slide the new slide precedes. This approach is useful to keep slides together as you add or delete slides.
- Specify an index indicating the numerical position of the slide in the presentation. This approach is useful when you want a slide to appear always in the same numerical position.

The first approach places the new slide immediately before slide you specify. If you created the reference slide using the PPT API, you can specify the `Slide` object. For example, using the default PPT API template, this code causes the `pictureSlide` to appear immediately before the `introSlide`.

```
slides = Presentation('myPresentation');
titleSlide = add(slides,'Title Slide');
introSlide = add(slides,'Title Slide');
pictureSlide = add(slides,'Title and Picture',introSlide);
```

In a presentation created using PowerPoint, adding a slide immediately before a slide that you created using PowerPoint requires a few steps.

1. In PowerPoint, identify the position of the reference slide you want the new slide to precede.
2. Open the PPT API program and give a name to the reference slide you want to position the new slide before. For example, assume that the reference slide is the second slide in a PowerPoint presentation.

   ```
   slides = Presentation('myPresentation','myPresentation');
   open(slides);

   slides.Children(2).Name = 'ReferenceSlide';
   close(slides);
   ```
3. To identify the reference slide object, use the slide name. Add the new slide relative to the reference slide.

   ```
   slides = Presentation('myPresentation', 'myPresentation');
   open(slides);

   refSlide = find(slides, 'ReferenceSlide');
   add(slides, 'Blank', refSlide);

   close(slides);
   ```

To use the second approach, specify an index representing the numerical position for the slide. For example, using the default PPT API template, this code makes `pictureSlide` the second slide in the presentation.

```
slides = Presentation('myPresentation');

titleSlide = add(slides,'Title Slide');
introSlide = add(slides,'Title and Content');
```

```
pictureSlide = add(slides,'Title and Picture',2);
```

Specify the Slide Master

A template can have multiple slide masters. Two or more slide masters can have a child slide layout with the same name. By default, when you specify the slide layout using PPT API, the API uses the first slide layout that has the name you specify. If you specify a slide master in an `add` method, specify the slide master argument immediately after the slide layout argument. For example, this code uses the `Title Slide` slide layout that is a child of the `myCustomMaster` slide master.

```
slides = Presentation('myPresentation');
titleSlide = add(slides,'Title Slide',myCustomMaster);
```

See Also

Functions

mlreportgen.ppt.Presentation.add | mlreportgen.ppt.Presentation.getLayoutNames | mlreportgen.ppt.Presentation.getMasterNames

Related Examples

- "Create a Presentation Object to Hold Content" on page 12-13
- "Add and Replace Presentation Content" on page 12-74

Add and Replace Presentation Content

In this section...

To use the PPT API to add, or replace, content in a PowerPoint presentation:

- Set up a PowerPoint template to hold the presentation content you want to add or replace.
- Create PPT API content objects, such as `Paragraph`, `Table`, and `Picture` objects.
- Use PPT API content objects to add or replace presentation content.

You can add and replace content in several ways. For example, you can:

- Add or replace content globally in a presentation or locally in a specific slide.
- Add content to a text box.
- Replace a text box, table, or picture with content of the same type.
- Replace a placeholder with content corresponding to that placeholder.

You cannot replace part of a paragraph, table, or text box. Replace the whole content object.

Set Up the Template

You can replace or add content to an existing PowerPoint presentation without modifying the template. However, using the PPT API requires knowledge of template and slide objects, including:

- Slide master names
- Slide layout names
- Slide placeholder and content object names
- Table style names

You can use using PowerPoint to add placeholders to a presentation and then use the PPT API to replace the placeholder with content. To replace a specific content object in a presentation, you can use PowerPoint to give a unique name to the content object. Then use that name with the PPT API.

For more information about using PowerPoint templates with a PPT API program, see:

- "Set Up a PowerPoint Template" on page 12-26
- "Access PowerPoint Template Elements" on page 12-37

Replace Content

You can replace content by specifying the content object name in a `replace` method with a `Slide` object. For example, in the default PPT API template, the `Title Slide` layout has a content object called `Title`.

```
titleSlide = add(slides,'Title Slide');

replace(titleSlide,'Title','This Is My Title');
```

To replace presentation content, you can use a `find` method with a `Presentation` or `Slide` object. The `find` method searches for content objects whose `Name` property value matches the search value you specify. Then you can use the index of the returned item that you want to update.

```
slides = Presentation('myPresentation');
titleSlide = add(slides,'Title Slide');

contents = find(slides,'Title');
replace(contents(1),'This Is My Title');
```

Add and Replace Text

You can use these approaches to add or replace text for to a presentation.

Text Specification Technique	Associated PPT API Objects
Specify a string as part of creating these objects.	• `Text` • `Paragraph` • `ExternalLInk`

Text Specification Technique	Associated PPT API Objects
Append text to a paragraph or external link.	Append text to these PPT API objects: • `Paragraph` • `TableEntry` • `ExternalLink`
Replace a `Paragraph` object in a presentation or slide.	Specify a string, `Paragraph` object, or a cell array of strings or `Paragraph` objects or a combination of both kinds of objects, for the `replace` method with these objects: • `Presentation` • `Slide`
Add to or replace text in a placeholder object.	• Add to a `ContentPlaceholder` object a string, `Paragraph` object, or with a cell array of strings or `Paragraph` objects, or a combination of both. • Replace a `ContentPlaceholder` object with a `Paragraph` object. • Add to a `TextBoxPlaceholder` object a string, `Paragraph` object, or with a cell array of strings or `Paragraph` objects or a combination of both. • Replace a `TextBoxPlaceholder` object with a `Paragraph` object. See “Add and Replace Text in Placeholders” on page 12-76.
Add to, or replace, a text box.	Add to or replace a `TextBox` object with a string, `Paragraph` object, or with a cell array of strings or `Paragraph` objects, or a combination of both. See “Add or Replace Text in a Text Box” on page 12-77.

Add and Replace Text in Placeholders

You can add or replace text in a `ContentPlaceholder` and a `TextBoxPlaceholder`, specifying:

- A string
- A `Paragraph` object
- A cell array of strings or `Paragraph` objects or a combination of strings and `Paragraph` objects. An inner cell array specifies inner list (indented) items.

The slide layout specifies whether the text appears as paragraphs, a bulleted list, or a numbered list.

```
import mlreportgen.ppt.*

name1 = 'before';
slides = Presentation(name1);
add(slides,'Comparison');
replace(slides, 'Left Content', 'dummy content');
replace(slides, 'Right Content', 'dummy content');
close(slides);

name2 = 'after';
slides = Presentation(name2, name1);

lefts = find(slides, 'Left Content');
rights = find(slides, 'Right Content');

para = replace(lefts(1), 'Left item in the list' );
para.Italic = true;
para.FontColor = 'green';

replace(rights(1), { ...
    'Right List item', ...
        { 'Inner right list item', 'Other inner right list item' }...
    'Right List item', ...
    });

close(slides);

if ispc
    winopen(slides.OutputPath);
end
```

Add or Replace Text in a Text Box

A text box in a slide is a box that you can add text to. You can programmatically add or replace the content of a text box in a presentation.

1. Create a `TextBox` object. Specify the location and width of the text box.
2. Add text by using the `add` method with the `TextBox` object.
3. Add the `TextBox` object to a presentation using the `add` method with a `Presentation` object or the `add` method with a `Slide` object.

For example :

```
import mlreportgen.ppt.*;
slides = Presentation('myPresentation.pptx');
titleSlide = add(slides,'Title Slide');

tb = TextBox();
tb.X = '2in';
tb.Y = '2in';
tb.Width = '5in';
add(tb,'Text for text box');

add(titleSlide,tb);
close(slides);
```

Add or Replace a Table

To add or replace a table in a presentation, first create a `Table` object. You can add a table by using an `add` method with a `Slide` object.

```
import mlreportgen.ppt.*;
slides = Presentation('myPresentation.pptx');
tableSlide = add(slides,'Blank');

magicTable = Table(magic(5));
magicTable.X = '3in';
MagicTable.Y = '5in';

add(tableSlide,magicTable);

close(slides);
```

To replace content in a table, replace the whole table. To replace a `Table` object, use the `replace` method with the `Table` object, and specify another `Table` object. To replace a table in a slide content placeholder, use the `replace` method with the `Slide` object and specify a `Table` object.

```
slides = Presentation('myPresentation');
```

```
tableSlide = add(slides,'Title and Table');

table1 = Table(magic(9));
contents = find(tableSlide,'Table');
replace(contents(1),table1);

close(slides);
```

Add or Replace a Picture

You can add a picture by using an `add` method or a `replace` method with a `Slide` object.

```
import mlreportgen.ppt.*;
slides = Presentation('myPresentation.pptx');
pictureSlide = add(slides,'Blank');

plane = Picture(which('b747.jpg'));
plane.X = '2in';
plane.Y = '2in';
plane.Width = '5in';
plane.Height = '2in';

add(pictureSlide,plane);

close(slides);
```

You can use a `replace` method with a `Picture` or `PicturePlaceholder` object. For example, the default template has a `Title and Picture` slide layout that has a picture placeholder called `Picture`.

```
import mlreportgen.ppt.*;
slides = Presentation('myPresentation');
pictSlide = add(slides,'Title and Picture');

plane2 = Picture(which('b747.jpg'));
contents = find(pictSlide,'Picture');
replace(contents(1),plane2);

close(slides);
```

PowerPoint adjusts the picture dimensions to fit in the picture placeholder. If the picture placeholder dimensions are bigger than the `Picture` object dimensions, the picture stretches proportionally. If the dimensions are smaller, the picture is centered.

Related Examples

- "Create and Format Text" on page 12-81
- "Create and Format Paragraphs" on page 12-84
- "Create and Format Tables" on page 12-87
- "Create and Format Pictures" on page 12-96
- "Create and Format Links" on page 12-98

More About

- "Presentation Formatting Approaches" on page 12-20

Create and Format Text

In this section...

Create Text

You can create a `Text` object using an `mlreportgen.ppt.Text` constructor, specifying a text string.

Also, you can create text by using a string with these kinds of PPT API objects:

- `Paragraph`
- `ExternalLink`
- `TableEntry`
- `TextBox`
- `ContentPlaceholder`
- `TextBoxPlaceholder`

For example:

```
import mlreportgen.ppt.*;
slides = Presentation('myPresentation.pptx');
slide1 = add(slides,'Title Slide');

contents = find(slide1,'Title');
titleText = replace(contents(1),'My Title');
```

For more information about creating and adding text, see "Add and Replace Text" on page 12-75.

Create a Subscript or Superscript

You can enable the `Subscript` or `Superscript` property for a `Text` object. Enabling these properties specifies that the text gets treated as a subscript or superscript when you add it to a `Paragraph` object. For example, you can set up a paragraph to display x^2.

```
super = Text('2');
super.Superscript = true;

para = Paragraph('x');
append(para,super);
```

Format Text

To format a `Text` object, use format objects with a `Text` object `Style` property or use `Text` object properties. For example:

```
t = Text('green text');
t.Style = {Bold(true)};
t.FontColor = 'green';
```

`Text` Object Formatting	Format Object	Format Property
Font family	`FontFamily`	`Font`
Font family for complex scripts to handle locales	`FontFamily`	`ComplexScriptFont`
Font size	`FontSize`	`FontSize`
Font color	`FontColor`	`FontColor`
Bold	`Bold`	`Bold`
Italic	`Italic`	`Italic`
Strike	`Strike`	`Strike`
Underline	`Underline`	`Underline`
Subscript	`Subscript`	`Subscript`
Superscript	`Superscript`	`Superscript`

See Also

Classes
mlreportgen.ppt.ExternalLink | mlreportgen.ppt.Paragraph | mlreportgen.ppt.Text | mlreportgen.ppt.TextBox

Related Examples

- "Add and Replace Text" on page 12-75

More About

- “Presentation Formatting Approaches” on page 12-20

Create and Format Paragraphs

In this section...
"Create a Paragraph" on page 12-84
"Format Paragraph Content" on page 12-84

Create a Paragraph

To create a `Paragraph` object, use the `mlreportgen.ppt.Paragraph` constructor. You can:

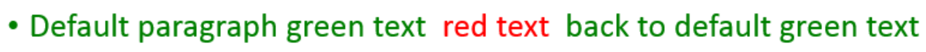
- Create an empty `Paragraph` object.
- Specify a string for the paragraph text.
- Specify a `Text` or `ExternalLink` object as the paragraph text.

After you create a `Paragraph` object, you can append strings or `Text` objects to add text to the paragraph. You can specify separate formatting for each `Text` and `ExternalLink` object that you append.

Format Paragraph Content

You can specify the default formatting to apply to the text in a paragraph. The paragraph formatting applies to text strings that you add. The paragraph formatting applies to `Text` and `ExternalLink` objects in the paragraph, unless those objects specify formatting that overrides the default paragraph formatting. For example, this code produces alternating red and green text:

```
p = Paragraph('Default paragraph green text');
p.FontColor = 'green';

redText = Text('  red text');
redText.FontColor = 'red';
append(p,redText);

moreText = Text('  back to default green text');
append(p,moreText);
```


• Default paragraph green text red text back to default green text

`Paragraph` Object Formatting	Format Object	Format Property
Font family	`FontFamily`	`Font`
Font family for complex scripts to handle locales	`FontFamily`	`ComplexScriptFont`
Font size	`FontSize`	`FontSize`
Bold	`Bold`	`Bold`
Font color	`FontColor`	`FontColor`
Italic	`Italic`	`Italic`
Strike	`Strike`	`Strike`
Underline	`Underline`	`Underline`
Subscript	`Subscript`	`Subscript`
Superscript	`Superscript`	`Superscript`
Horizontal alignment	`HAlign`	`HAlign`
Level of indentation Use the PowerPoint template to specify formatting for each level.	n/a	`Level`

Tip Although you can specify that text in a `Paragraph` object is a subscript or superscript, using `Text` objects with `Subscript` or `Superscript` property set gives you greater formatting flexibility.

See Also

Classes
mlreportgen.ppt.ExternalLink | mlreportgen.ppt.Paragraph | mlreportgen.ppt.Text | mlreportgen.ppt.TextBox

Classes
mlreportgen.ppt.TableEntry

Related Examples

- “Add and Replace Text” on page 12-75

More About

- “Presentation Formatting Approaches” on page 12-20

Create and Format Tables

In this section...

Create a Table

To create a table, you can:

- Create an empty `Table` object using the `mlreportgen.ppt.Table` constructor without arguments. Then append `TableRow` objects to the `Table` object and append `TableEntry` objects to the `TableRow` objects.
- Create an empty `Table` object using the `mlreportgen.ppt.Table` constructor, specifying the number of columns.
- Create a `Table` object whose rows and columns are populated by the values you specify in the constructor. You can specify a two-dimensional numeric array or a two-dimensional cell array of numbers, strings, and `Paragraph` objects. You can also use a combination of these kinds of values.

For an example of creating a table by appending table rows to an empty table, see `mlreportgen.ppt.TableRow`. For an example of creating a table by specifying values in the Table object constructor, see `mlreportgen.ppt.Table`.

Format a Table

You can specify a table style name for the overall look of a table, such as a table that shades alternating rows. You can set the `StyleName` property of a `Table` object to the name of a table style.

Table Styles in Templates

The PowerPoint template must contain an instance of the table style for you to use it in a PPT API program. To list the instances of table styles in your template, use `getTableStyleNames`.

```
import mlreportgen.ppt.*
```

```
%% Create a new presentation and open it
slides = Presentation('myPrsentation');
open(slides);

%% Print out all table styles and
%% their universally unique identifiers (UUID)
pptStyles = getTableStyleNames(slides);
fprintf('Available table styles:\n');
for i = 1:length(pptStyles)
    fprintf('    Style name: ''%s''\n', pptStyles{i,1});
    fprintf('          UUID: ''%s''\n', pptStyles{i,2});
end

%% Close the presentation
close(slides);
```

Each style returned has a name and an ID. You can use the name or the ID with the `Style` property. Use the ID when the name can vary based on locale.

```
Available table styles:
    Style name: 'Medium Style 2 - Accent 1'
          UUID: '{5C22544A-7EE6-4342-B048-85BDC9FD1C3A}'
    Style name: 'Light Style 1'
          UUID: '{9D7B26C5-4107-4FEC-AEDC-1716B250A1EF}'
    Style name: 'Light Style 1 - Accent 1'
          UUID: '{3B4B98B0-60AC-42C2-AFA5-B58CD77FA1E5}'
    Style name: 'Light Style 1 - Accent 2'
          UUID: '{0E3FDE45-AF77-4B5C-9715-49D594BDF05E}'
```

If the name of the style you want to use does not have an instance, create one.

1. Create a slide in your PowerPoint template.
2. In the slide, create a table.
3. Apply the styles that you want to use in your program to the table. Applying a style creates an instance of the style in the template.
4. Delete the slide, and save and close the template.

Format a Table Using a Table Style

This example shows how to format a table using a table style.

```
import mlreportgen.ppt.*
```

```
%% Create a new presentation and add two slides to it
slides = Presentation();
add(slides,'Title and Content');
add(slides,'Title and Content');


%% Save the two content placeholders named 'Content' in an array.
%% Replace the first content placeholder with a 5x5 table and
%% apply a table style to it.
contents = find(slides,'Content');
tbl = replace(contents(1),Table(magic(5)));
tbl.StyleName = 'Medium Style 2 - Accent 1'

%% Replace the second content placholder with a 10x10 table and
%% apply a different table style.
%% Generate the presentation and open  it.
tbl = replace(contents(2),Table(magic(10)));
tbl.StyleName = 'Medium Style 2 - Accent 2'
close(slides);

if ispc
    winopen(slides.OutputPath);
end
```

This code creates a PowerPoint presentation that has two slides. Each slide contains a table, and each table has a different table style applied to it.

Formatting Options

You can specify the location (upper-left x and y coordinates), height, and width properties of a table. When you add the table to a presentation programmatically, PowerPoint uses those properties, if all of the table content fits in the table. When you replace a `TablePlaceholder` or `ContentPlaceholder` with a table, PowerPoint fits the table in the placeholder location and dimensions.

You can specify default formatting for the contents of a table, a column, a table row, and a table entry. Table entry formatting takes precedence over the formatting you specify for a column or for a table row. Table row formatting takes precedence over table formatting.

You can specify these default formatting options for the contents of a `Table` object.

`Table` Object Formatting	Format Object	Format Property
Table style from template	n/a	`StyleName`

`Table` Object Formatting	Format Object	Format Property
Use the PowerPoint template to specify table style formatting. Create an instance of the style in your template.		
Background color	`BackgroundColor`	`BackgroundColor`
Column formatting	`ColSpec`	`ColSpecs`
Vertical alignment of table cell content	`VAlign`	`VAlign`
Font family	`FontFamily`	`Font`
Font family for complex scripts to handle locales	`FontFamily`	`ComplexScriptFont`
Font size	`FontSize`	`FontSize`
Font color	`FontColor`	`FontColor`
Upper-left x-coordinate of the table	n/a	`X`
Upper-left y-coordinate of the table	n/a	`Y`
Table width	n/a	`Width`
Table height	n/a	`Height`

To specify default formatting for the contents of a `TableRow` object, use the `Style` property with these format objects.

`TableRow` Object Formatting	Format Object	Format Property
Background color	`BackgroundColor`	n/a
Vertical alignment of table cell content	`VAlign`	n/a
Font family	`FontColor`	n/a
Font family for complex scripts	`FontFamily`	n/a
Font size	`FontSize`	n/a

`TableRow` Object Formatting	Format Object	Format Property
Text color	`FontColor`	n/a
Bold	`Bold`	n/a
Italic	`Italic`	n/a
Strike	`Strike`	n/a
Underline	`Underline`	n/a
Background color	`BackgroundColor`	n/a

To specify default formatting for the contents of a `TableEntry` object, use these formatting options.

`TableEntry` Object Formatting	Format Object	Format Property
Background color	`BackgroundColor`	`BackgroundColor`
Column width	`ColWidth`	n/a
Vertical alignment of table cell content	`VAlign`	`VAlign`
Font family	`FontFamily`	`Font`
Font family for complex scripts to handle locales	`FontFamily`	`ComplexScriptFont`
Text color	`FontColor`	`FontColor`
Font size	`FontSize`	`FontSize`
Bold	`Bold`	n/a
Italic	`Italic`	n/a
Strike	`Strike`	n/a
Underline	`Underline`	n/a

Access a Table Row or Entry

To access a row in a table, use the `mlreportgen.ppt.Table.row` method. Specify the `Table` object and the number of the row you want to access. For example, to access a `TableRow` object for the second row of `myTable`, use:

```
myTable = Table(magic(5));
```

```
row2 = row(myTable,2);
```

To access an entry in a table, use the `mlreportgen.ppt.Table.entry` method. Specify the `Table` object and the number of the row and the number of the column that you want to access. For example, to access a `TableEntry` object for the third entry in the second row of `myTable`, use:

```
myTable = Table(magic(5));
entry3row2 = entry(myTable,2,3);
```

Alternatively, you can access a table row by using the `Children` property of a `Table` object. You can access a table entry by using the `Children` property of a `TableRow` object. For example, to access the third entry in the second row of `myTable`:

```
myTable = Table(magic(5));
entry3row2 = myTable.Children(2).Children(3);
```

Format a Column

To format a column in a table, use one or more `mlreportgen.ppt.ColSpec` objects. Create a `ColSpec` object for each column that you want to format and specify the formatting for each `ColSpec` object. Then define an array of the `ColSpec` objects and use that with the `ColSpecs` property of the `Table` object.

The format specification for a table row takes precedence over the format specification for a column.

```
import mlreportgen.ppt.*
slidesFile = 'myColSpecs.pptx'
slides = Presentation(slidesFile);
add(slides,'Title and Content');

t = Table(magic(12));
t.Style = {HAlign('center')};

colSpecs(2) = ColSpec('1.5in');
colSpecs(1) = ColSpec('1.5in');
colSpecs(1).BackgroundColor = 'red';
colSpecs(2).BackgroundColor = 'green';
t.ColSpecs = colSpecs;
t.row(2).Style = {VAlign('bottom')};
t.row(2).BackgroundColor = 'tan';
t.entry(2,3).FontColor = 'red';
```

```
t.entry(2,3).FontSize = '30pt';

replace(slides,'Content',t);

close(slides);
if ispc
winopen(slides.OutputPath);
end
```

When you create a `ColSpec` object, you can specify the column width in the constructor. For example:

```
myColSpec = ColSpec('3in');
```

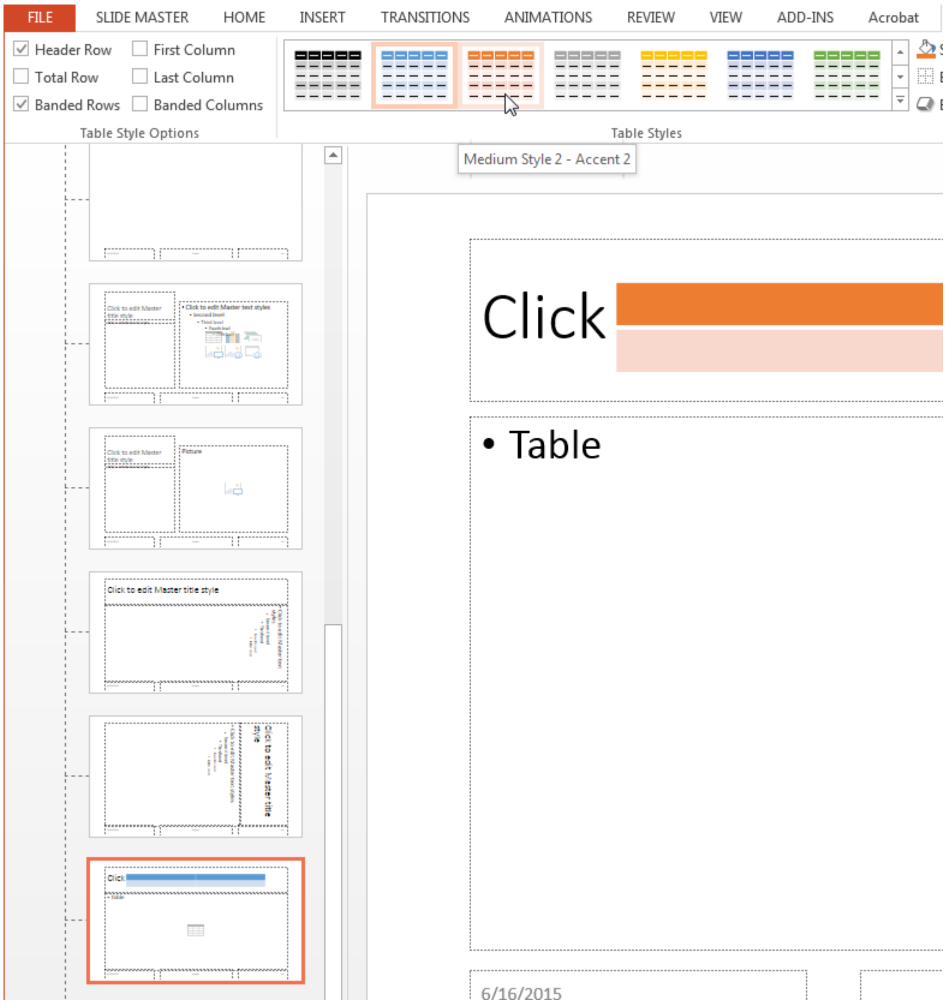
Also, you can specify the column width using the Width property of a `ColSpec` object. You specify other formatting properties of the `ColSpec` object, such as `BackgroundColor`.

View Table Style Names

If you use the PPT API, to specify a table style other than the default, you need to know the names of table styles in a PowerPoint template. You can view the name in PowerPoint or using the PPT API.

1. In PowerPoint, select **View** > **Slide Master**.
2. In a slide layout that has a table, click `Table` (or anywhere in that placeholder). On the **Insert** tab, click **Table**.
3. Create an empty table in the slide layout.

   A panel of **Table Styles** appears. To see the name of a table style, hover over the table style image.



To see table style names using the PPT API, use the `getTableStyleNames` method with an `mlreportgen.ppt.Presentation` object. The output in this example shows just the first two of many table styles in the default template.

```
import mlreportgen.ppt.*
slides = Presentation('myPlaceholderPresentation');

getTableStyleNames(slides)
```

```
ans =

    'Medium Style 2 - Accent 1'          '{5C22544A-7EE6-4342-B048-85BDC9FD1C3A}'
    'Light Style 1'                      '{9D7B26C5-4107-4FEC-AEDC-1716B250A1EF}'
```

To use a table style name with the PPT API, you can use either the name string or the numeric identifier string.

See Also

Functions
mlreportgen.ppt.Table.entry | mlreportgen.ppt.Table.row

Classes
mlreportgen.ppt.ColSpec | mlreportgen.ppt.ColWidth | mlreportgen.ppt.Table | mlreportgen.ppt.TableEntry | mlreportgen.ppt.TablePlaceholder | mlreportgen.ppt.TableRow

Related Examples

- “Add or Replace a Table” on page 12-78

More About

- “Presentation Formatting Approaches” on page 12-20

Create and Format Pictures

In this section...
"Create a Picture" on page 12-96
"Format a Picture" on page 12-97

Create a Picture

To create a picture for a presentation, use the `mlreportgen.ppt.Picture` constructor. Specify the path to a picture file. The picture file must use one of these formats (you cannot use `.svg` format):

- `.bmp`
- `.emf`
- `.eps`
- `.gif`
- `.jpeg`
- `.jpg`
- `.png`
- `.tif`
- `.tiff`

For example:

```
import mlreportgen.ppt.*
slides = Presentation('slides');
pictureSlide = add(slides,'Blank');

plane = Picture(which('b747.jpg'));
plane.Width = '5in';
plane.Height = '2in';

add(pictureSlide,plane);

close(slides);
```

Format a Picture

When you create a `Picture` object, you can specify the location, width, and height. The specified formatting applies when you add a picture to a slide or replace a `Picture` object. When you replace a `PicturePlaceholder` object with a `Picture` object, PowerPoint adjusts the replacement picture to fit the location and dimensions of the placeholder.

You can specify these format properties for a `Picture` object.

`Picture` Object Formatting	Format Object	Format Property
Upper-left x-coordinate of picture	n/a	`X`
Upper-left y-coordinate of picture	n/a	`Y`
Picture width	n/a	`Width`
Picture height	n/a	`Height`

See Also

Classes
mlreportgen.ppt.Picture | mlreportgen.ppt.PicturePlaceholder

Related Examples

- “Add or Replace a Picture” on page 12-79

More About

- “Presentation Formatting Approaches” on page 12-20

Create and Format Links

In this section...
"Create an External Link" on page 12-98
"Format an External Link" on page 12-98

Create an External Link

To create a link to a location outside of a presentation, use the `mlreportgen.ppt.ExternalLink` constructor. Specify the full URL of the link target and specify the link text as a string. For example:

```
import mlreportgen.ppt.*

slidesFile = 'myExternalLinkPresentation.pptx';
slides = Presentation(slidesFile);

add(slides,'Title and Content');

p = Paragraph('This is a link to the ');
link = ExternalLink('http://www.mathworks.com','MathWorks site.');

append(p,link);
replace(slides,'Content',p);

close(slides);

if ispc
    winopen(slidesFile);
end
```

Format an External Link

To specify default formatting for the link text, use the `Style` property with format objects.

`ExternalLink` Object Formatting	Format Object	Format Property
Font family	`FontFamily`	n/a

`ExternalLink` Object Formatting	Format Object	Format Property
Font family for complex scripts to handle locales	`FontFamily`	n/a
Text color	`FontColor`	n/a
Font size	`FontSize`	n/a
Bold	`Bold`	n/a
Italic	`Italic`	n/a
Strike	`Strike`	n/a
Underline	`Underline`	n/a
Background color	`BackgroundColor`	n/a

See Also

Classes
mlreportgen.ppt.ExternalLink

More About

- “Presentation Formatting Approaches” on page 12-20