



Database Manager Exercises

Operating System/2
Extended Edition
Version 1.3

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About This Book

This book includes exercises to introduce you to some Database Manager functions. In addition, this book contains a brief overview of *database* concepts, procedures for logging on to your workstation, and procedures for installing a sample database.

You must have already installed Database Manager and Query Manager as described in *IBM Operating System/2 Extended Edition Version 1.3 Getting Started*.

Who Should Read This Book

This book is written for users that will use Query Manager to perform Database Manager tasks. You should perform these exercises before continuing with the *IBM Operating System/2 Extended Edition Version 1.3 User's Guide, Volume 3: Database Manager*.

Help Information

Database Manager provides you with help while you use Query Manager. To display help information related to the current task, panel, menu, item, or message, you can press the Help (F1) key or select **F1=Help** or Help with a pointing device, such as a mouse.

Administrator Roles

The following definitions define four administrator roles. These four roles can be filled by one or more individuals, depending upon your particular organization. For instance, the Communications Manager system administrator and network administrator may be the same person or different people, and they may be called by different titles in your organization. In some cases, an organization may have many people responsible for different aspects of one of the following roles listed here.

The following definitions of roles are provided to clarify how they are used throughout the Operating System/2* program library:

Communications Manager system administrator (referred to as system administrator): This role, performed by technically skilled individuals, includes helping users of the OS/2* program plan for and install, configure, and use the functions of the Communications Manager component of the OS/2 program.

Network administrator: This role includes installing, managing, controlling, and configuring a network or a local area network. The network administrator defines resources to be shared and user access to the shared resources and determines the type of access those users have.

Database Manager system administrator: This role, performed by technically skilled individuals familiar with databases, includes helping users plan for, install, configure, and use the Database Manager component of the OS/2 program. Tasks include creating and controlling databases, deciding where databases will be stored, establishing users and groups, and helping users understand database server and requester concepts and use. To perform many of these tasks, an individual must have *SYSADM* (system administrator) authority for Database Manager.

Database administrator: This role includes designing, developing, operating, safeguarding, and maintaining a single database.

Disk Backup

All magnetic media are subject to physical damage, erasure, and loss of data for a variety of reasons, including operator error, accidental occurrences, and machine malfunction. In addition, magnetic media are subject to theft. Therefore, an integral part of any informational system should be to establish and implement backup (duplication) procedures. The customer, *not IBM**, is solely responsible for establishing and implementing all such procedures.

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Chapter 1. Before You Begin the Exercises

This book includes exercises to help you understand some Database Manager functions that are available through Query Manager, a part of Database Manager. Before beginning the exercises, you may benefit from a brief overview of *database* concepts. Also, you must log on to your workstation and install the sample database before beginning the exercises.

Database Concepts

Database Manager is a *relational* database manager. Even with limited database knowledge, you can use Query Manager menus, panels, and pull-downs to create and use a relational database.

A database is information stored in your computer. A relational database is a collection of data arranged in one or more *tables*. Tables are groups of related information as shown in the following two examples of tables in a relational database:

<u>DEPTNUMB</u>	<u>DEPTNAME</u>	<u>MANAGER</u>	<u>DIVISION</u>	<u>LOCATION</u>
10	Head Office	160	Corporate	New York
15	New England	50	Eastern	Boston
20	Mid Atlantic	10	Eastern	Washington
38	South Atlantic	30	Eastern	Atlanta
42	Great Lakes	100	Midwest	Chicago
51	Plains	140	Midwest	Dallas
66	Pacific	270	Western	San Francisco
84	Mountain	290	Western	Denver

ORG Table

<u>ID</u>	<u>NAME</u>	<u>DEPT</u>	<u>JOB</u>	<u>YEARS</u>	<u>SALARY</u>	<u>COMM</u>
10	Sanders	20	Mgr	7	18357.50	-
20	Pernal	20	Sales	8	18171.25	612.45
30	Marenghi	38	Mgr	5	17506.75	-
40	O'Brien	38	Sales	6	18006.00	846.55
50	Hanes	15	Mgr	10	20659.80	-
60	Quigley	38	Sales	-	16808.30	650.25
70	Rothman	15	Sales	7	16502.83	1152.00
80	James	20	Clerk	-	13504.60	128.20
90	Koonitz	42	Sales	6	18001.75	1386.70

STAFF Table

**Data
Row**

The data in a table is arranged in columns and rows. A column is displayed vertically on the screen, contains only one kind of data, and has a name. For example, in the ORG table, the DEPTNAME column contains a set of department names, such as Head Office, New England, and so on.

A row is displayed horizontally on the screen, contains different kinds of data about a single thing, and has no name. All the data in any one row is related. For example, in the STAFF table, the first row contains a set of values that describes one employee, such as ID 10, Name Sanders, Dept 20, and so on.

An advantage of using a relational database is that it allows you to use the relationships defined in database tables without requiring that you understand how the data is physically stored and managed by the system. Database Manager uses Structured Query Language (SQL) to manipulate data. For example, to request a name from the STAFF table, you can use the following SQL statement:

```
SELECT NAME
FROM STAFF
WHERE ID=40
```

In this statement, NAME defines the column requested, STAFF defines the table, and WHERE ID = 40 determines the row you wish to see.

The following exercises give you a hands-on introduction to some of the basic tasks that you can do using Query Manager.

The exercises show you how to query a database to obtain salary information on selected departments within a company. You create a report showing the employee names and their total earnings and then subtotal the report by department. In addition, the exercises show you how to revise a report and add or change data within a table.

Navigation Techniques

The following table describes several ways you can navigate through the menus, panels, and pull-downs in Query Manager.

If you need to:	You should:
Open an item from a single-select menu	Move the pointer to the item you want and press mouse button 1 twice or use the Tab key or cursor movement keys (↑, ↓, ←, →) to move the cursor to the item you want and press the Enter key.
Select items from a multiple-select menu with a mouse	Move the pointer to an item you want and press mouse button 1 to mark the item. Repeat this for other items and then select Enter.
Select items from a multiple-select menu with a keyboard	Use the Tab key or cursor movement keys (↑, ↓, ←, →) to move the cursor to an item you want and press the Spacebar to mark the item. Repeat this for other items and then press the Enter key.
Select an item using a mnemonic	In a menu pull-down or list, press the key for the underscored or highlighted letter of the option you want.
Deselect an item from a single-select menu	Move the pointer from the marked item or use the Tab key or cursor movement keys (↑, ↓, ←, →).
Deselect an item from a multiple-select menu with a mouse	Move the pointer to the marked item and press mouse button 1 so that the item is no longer highlighted.
Deselect an item from a multiple-select menu with a keyboard	Use the Tab key or cursor movement keys (↑, ↓, ←, →) to move the cursor to the marked item and press the Spacebar so that the item is no longer highlighted.
Insert data in an entry field	Press the Insert (Ins) key so that you are in INSERT mode. In INSERT mode, the data you type is inserted in front of the existing data.
Replace data in an entry field	Press the Insert (Ins) key so that you are in REPLACE mode. In REPLACE mode, the data you type replaces the existing data.

Logging On to Your Workstation

To use Database Manager, you must log on to your workstation through User Profile Management (UPM). If your UPM user ID has administrator or local administrator authority, you have the authority to create a database (and to use the SQLSAMPL command, described later in this book).

At the time the OS/2 program is installed, the default UPM user ID is USERID, which is set up with administrator authority. The default password is PASSWORD.

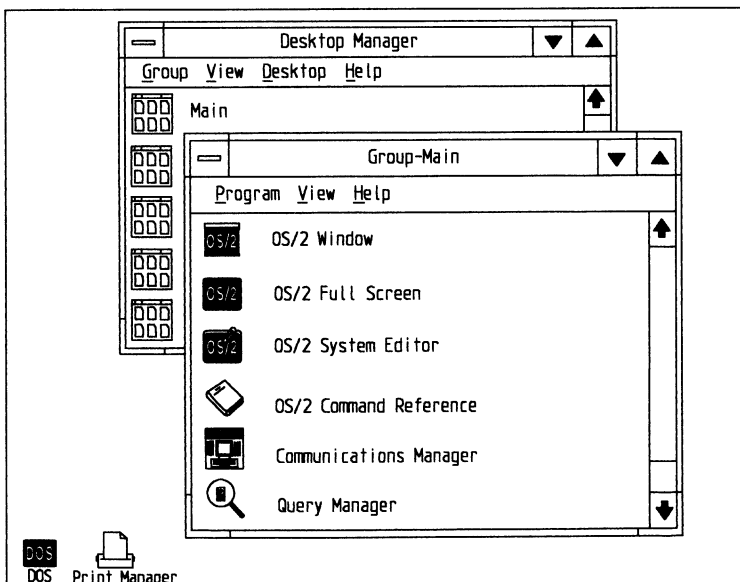
If you have not created or been assigned a user ID for your workstation, you can continue these exercises using USERID and PASSWORD.

If you are a user on a Database Requester, you must have a UPM user ID and password created on the Database Server workstation. If either the user ID or password is different from the user ID and password you use for your Database Requester, you are prompted for the user ID and password when you first access a database on the Database Server.

Follow these steps to log on to your workstation:

1. Turn on your workstation.

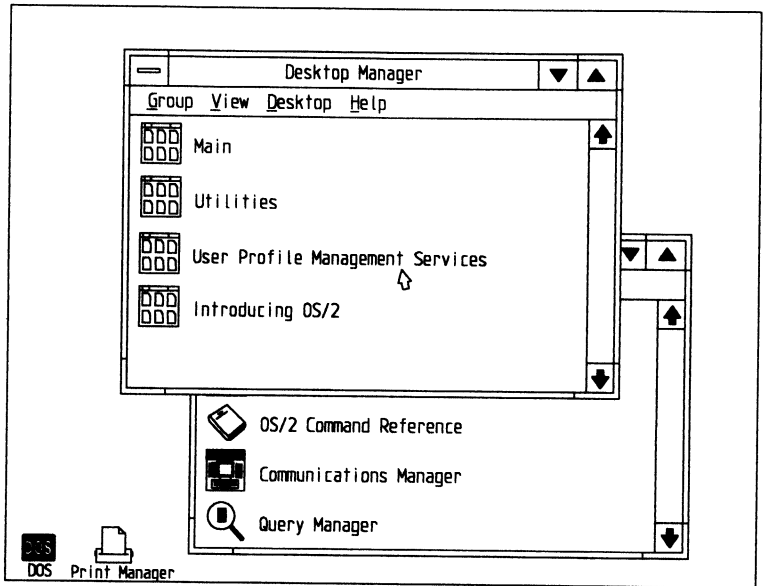
The Desktop Manager window and Group-Main window may be displayed when your system is started. If the windows are not displayed, press the Alternate (Alt) + Cancel(Esc) keys until the Desktop Manager window and Group-Main window are displayed.



Note: The illustrations in this book may not be identical to those displayed on your workstation due to differences in displays, fonts, installed components, and so on.

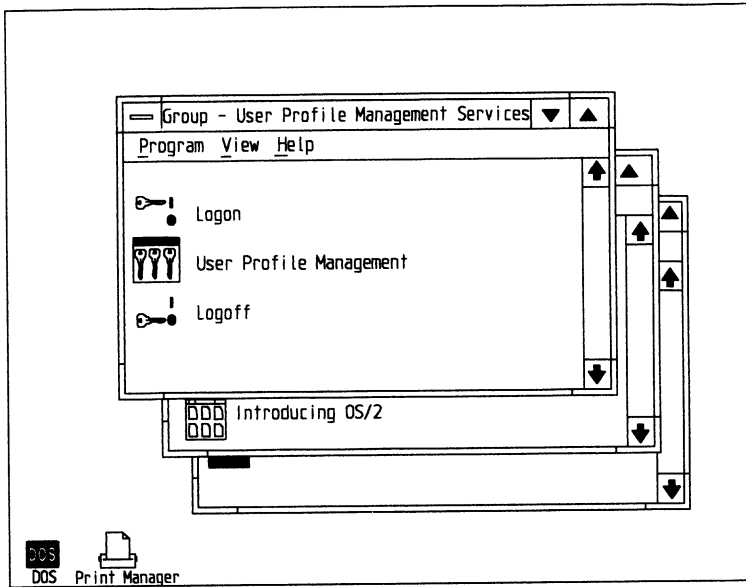
Position your cursor anywhere on the Desktop Manager window and press mouse button 1 to make it the *active* menu.

The Desktop Manager window is displayed.



2. Select **User Profile Management Services** in the Desktop Manager window.

The Group-User Profile Management Services menu is displayed.



3. Select **Logon** in the Group-User Profile Management Services menu.

The Logon panel is displayed.

4. Type your user ID and password (if required) and select Enter to log on.

Note: If you have not created or been assigned a user ID and password, the defaults are USERID and PASSWORD.

The Group-User Profile Management Services menu is displayed again.

You have completed the logon procedure.

If you are a user on a Database Requester workstation, you must ensure that Communications Manager has been started at your workstation. Additionally, Communications Manager and Database Manager must be started at the Database Server workstation. If you need assistance, contact your Database Manager system administrator.

Installing the Sample Database and Starting Query Manager

Note: If your workstation is a Database Requester, check with your system administrator to ensure that the sample database has been installed on the Database Server and cataloged on your workstation. This must be done to access the sample database and perform the following exercises.

As a prerequisite to use the `SQLSAMPL` command to install the sample database on your workstation, your UPM user ID must have either administrator or local administrator authority. If you are using the default user ID (`USERID`), that ID has administrator authority. If someone else installed the OS/2 program on your workstation, you must ask that person (or any user with the correct UPM authority for your workstation) to do the following:

1. Select **Main** in the Desktop Manager window.
The Group-Main window is displayed.
2. Select **OS/2 Full Screen** in the Group-Main window.
3. Type `sqlsaml` at the OS/2 Full Screen command prompt and press the Enter key.

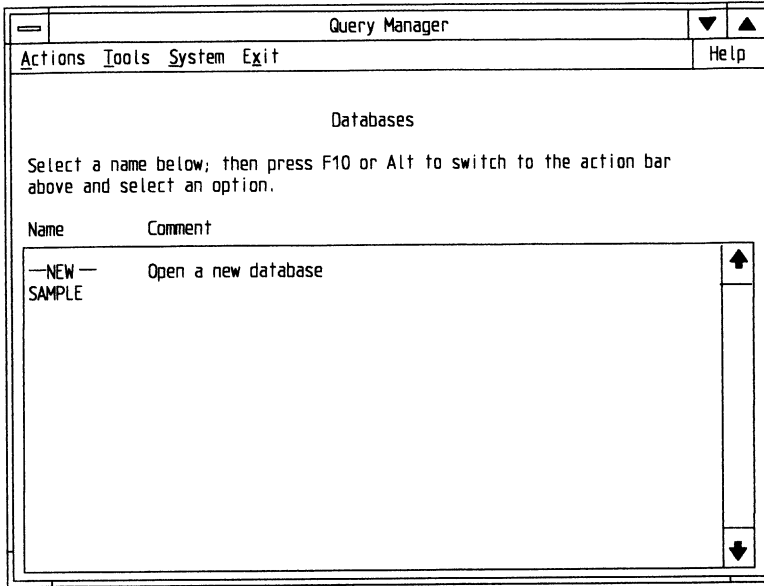
Note: If the Logon panel is displayed, type your user ID and password and select Enter.

When the sample database installation program completes, the OS/2 Full Screen command prompt is displayed again. You have now created a sample database, `SAMPLE`, which consists of two tables, `STAFF` and `ORG`.

Note: If you receive any error messages, see the *User's Guide, Volume 3: Database Manager* for error recovery information.

4. Type **Exit** and press the Enter key.
The Group-Main window is displayed.
5. Select **Query Manager** in the Group-Main window.

When Query Manager is started, the Databases primary menu is displayed.



You have completed creating your sample database and have started Query Manager. Continue with "Opening the Sample Database" on page 1-9.

Opening the Sample Database

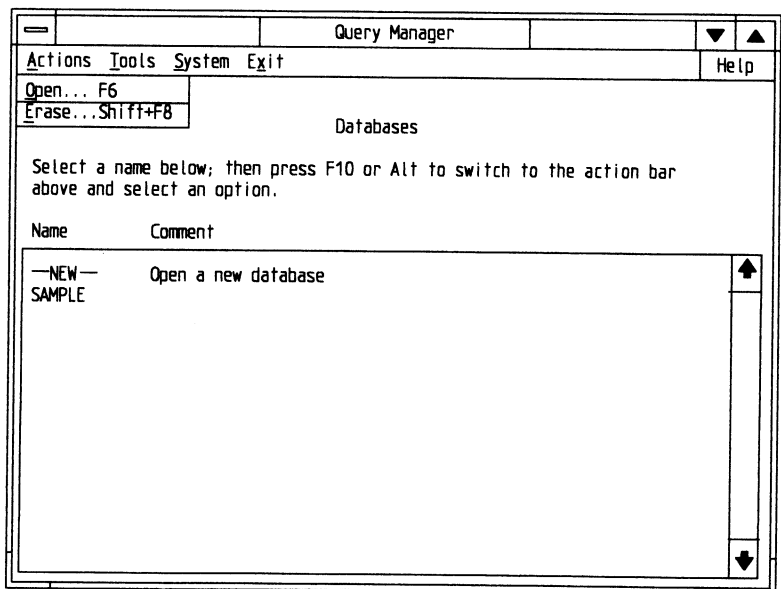
After you start Query Manager, the Databases primary menu is the first menu that is displayed. For the following exercises, you must open the sample database from the Databases primary menu and display the Main Selection for SAMPLE menu.

If you are opening a sample database that is located on a Database Server, ensure that you start Communications Manager before Query Manager. Also, ensure that both Communications Manager and Database Manager have been started at the Database Server workstation.

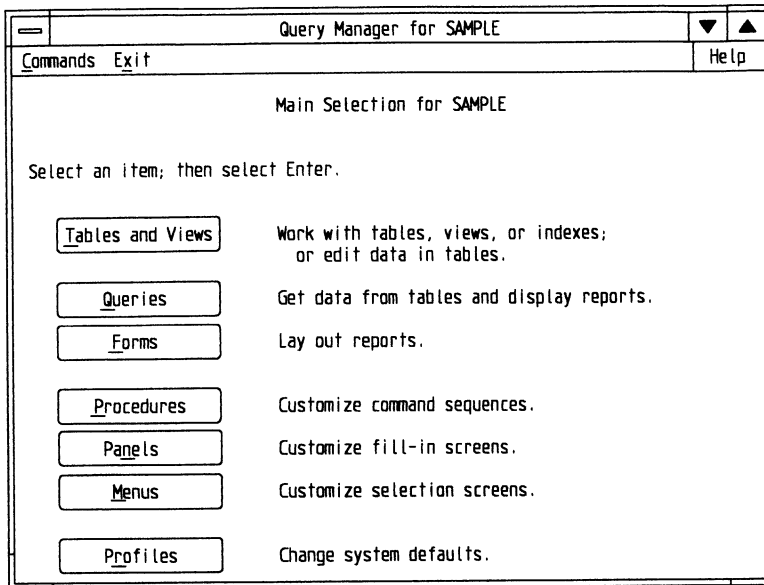
1. Select **SAMPLE** in the Databases primary menu.

Note: If your local user ID or password is different from the user ID or password you use to access the Database Server, you are prompted with an additional logon panel after you select the sample database in Query Manager.

2. Select **Actions** from the action bar and then select **Open** in the pull-down. Alternate method—Press the Open (F6) key.



The Main Selection for SAMPLE menu is displayed.



Note: You can get information about each item on the menu by positioning the cursor on the item and selecting Help.

You have completed opening the sample database. The following exercises should be started from the Main Selection for SAMPLE menu.

Qualifiers in Query Manager

All objects (such as tables, queries, and forms) created with Query Manager are prefixed by *qualifiers*. You can set qualifiers for groups of objects in order to access them more efficiently and quickly. For example, if you have several tables containing accounting information, you can set the active qualifier to ACCTG when you create the tables. Then all the tables are prefixed by ACCTG, as in ACCTG.TABLE1, ACCTG.TABLE2, ACCTG.TABLE3. You can then list and access only the accounting tables by using ACCTG as the qualifier when listing tables in the Tables and Views primary menu.

Unless you change the *active qualifier* from the OS/2 command prompt or Query Manager profile, the active qualifier is set to the user ID that was active when Query Manager was started. The qualifier is shown at the top of panels and menus as `Qualifier=xxxxxx`. For more information about qualifiers, see the *User's Guide, Volume 3: Database Manager*.

Chapter 2. Exercises

You can perform these practice exercises to become familiar with some of the query and report functions that Query Manager provides.

Complete the exercises in the order that they are presented. If you need to stop, complete the exercise you are in and then continue with the remaining exercises at a later time.

You can use a pointing device (such as a mouse) or a keyboard to perform the exercises. If you are using a keyboard and are in the body of a menu (such as the Queries primary menu), you can perform many of the functions or options without going to the action bar by using fast-path keys. For example, you can use a fast-path key, the F6 key, for selecting **Open** without first selecting **Actions** from the action bar.

A selection field can be in a *single-select menu* or a *multiple-select menu*. In a single-select menu, you can select only one item. In a multiple-select menu, you can select one or more items. Some single-select menus have an underlined letter or mnemonic, which, after you press the key, moves the cursor to that selection field and selects that item.

In the following exercises, navigation using mouse button 1 is described first in each task step; fast-path keys (not mnemonics) are provided as an alternate method.

If you are in the body of a menu or panel and want to go to the action bar, you must press the Switch to Action Bar (F10) key. If you are using a mouse, position the pointer on the item you want to select from the action bar and then press mouse button 1 once to select the item, which displays the pull-down; then select the item you want from the pull-down.

If you need more information on how to select items from menus, action bars, and pushbuttons, see “Navigation Techniques” on page 1-3.

Exercise 1 - Querying a Database and Displaying a Report

Prompted query provides an easy way to create and run a query. It helps you access and select information from tables. When you use prompted query, it prompts you step-by-step to create a query. You need to know which tables contain the data you want and how that data is structured in columns and rows.

For the following exercises, you will use information from two tables named **ORG** and **STAFF** to learn how to create basic queries using Query Manager.

The **ORG** table contains information about each department within an organization: the department number, the department name, the IDs of the department managers, the division the department is in, and the location (city) of the department.

The **STAFF** table contains information about each employee: ID, name, department number, job title, years in the company, salary, and commission.

<u>DEPTNUMB</u>	<u>DEPTNAME</u>	<u>MANAGER</u>	<u>DIVISION</u>	<u>LOCATION</u>
10	Head Office	160	Corporate	New York
15	New England	50	Eastern	Boston
20	Mid Atlantic	10	Eastern	Washington
38	South Atlantic	30	Eastern	Atlanta
42	Great Lakes	100	Midwest	Chicago
51	Plains	140	Midwest	Dallas
66	Pacific	270	Western	San Francisco
84	Mountain	290	Western	Denver

ORG Table

<u>ID</u>	<u>NAME</u>	<u>DEPT</u>	<u>JOB</u>	<u>YEARS</u>	<u>SALARY</u>	<u>COMM</u>
10	Sanders	20	Mgr	7	18357.50	-
20	Pernal	20	Sales	8	18171.25	612.45
30	Marengli	38	Mgr	5	17506.75	-
40	O'Brien	38	Sales	6	18006.00	846.55
50	Hanes	15	Mgr	10	20659.80	-
60	Quigley	38	Sales	-	16808.30	650.25
70	Rothman	15	Sales	7	16502.83	1152.00
80	James	20	Clerk	-	13504.60	128.20
90	Koonitz	42	Sales	6	18001.75	1386.70

STAFF Table

In the following exercises, you learn how to create queries using prompted query and its key features. Each exercise shows one or more of the features of prompted query. These exercises cover some of the more important aspects of prompted query.

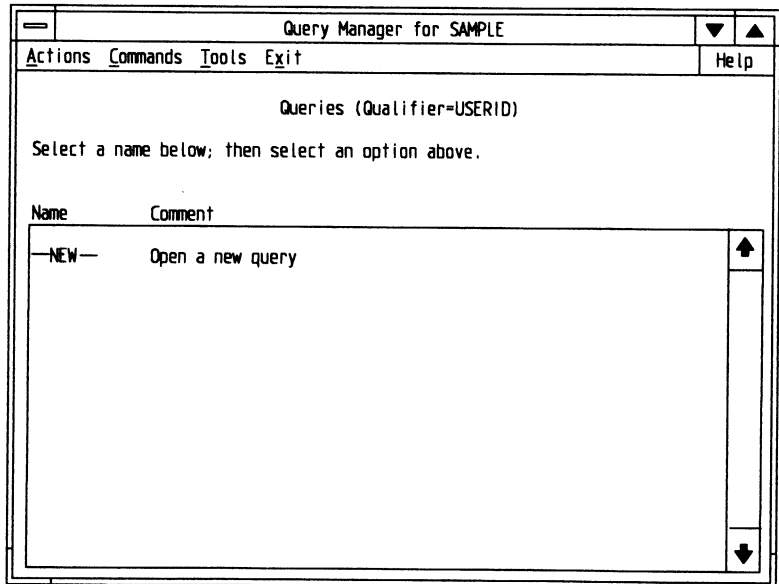
To Query a Table

In this exercise, you create a query of the STAFF table to show the names, jobs, and total earnings of all employees in departments 15, 20, and 38. You then run the query.

1. Select **Queries** in the Main Selection for SAMPLE menu.

Note: If the Main Selection for SAMPLE menu is not already displayed, select **Query Manager** in the Group-Main window.

The Queries primary menu is displayed.

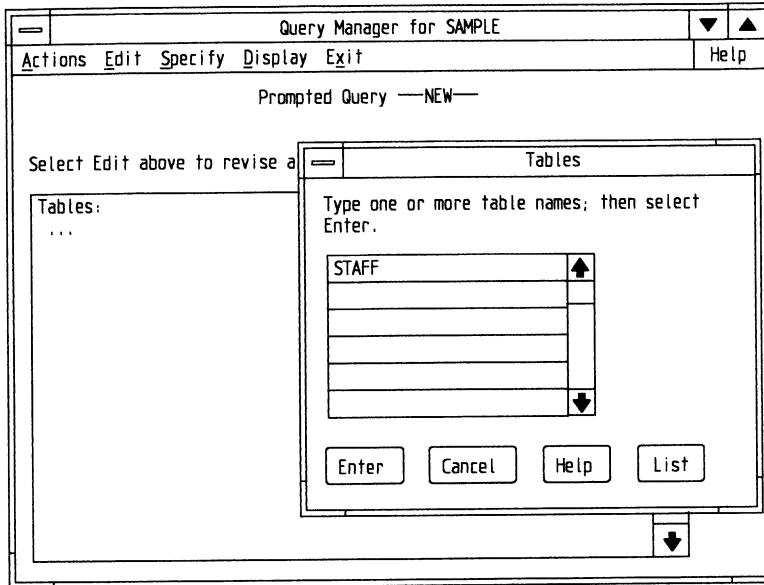


Note: The qualifier may show the ID of the person who installed the sample database instead of USERID.

2. Select **—NEW—** in the Queries primary menu.
3. Select **Actions** from the action bar and then select **Open** in the pull-down. Alternate method—Press the Open (F6) key.

The Tables panel is displayed on the Prompted Query panel.

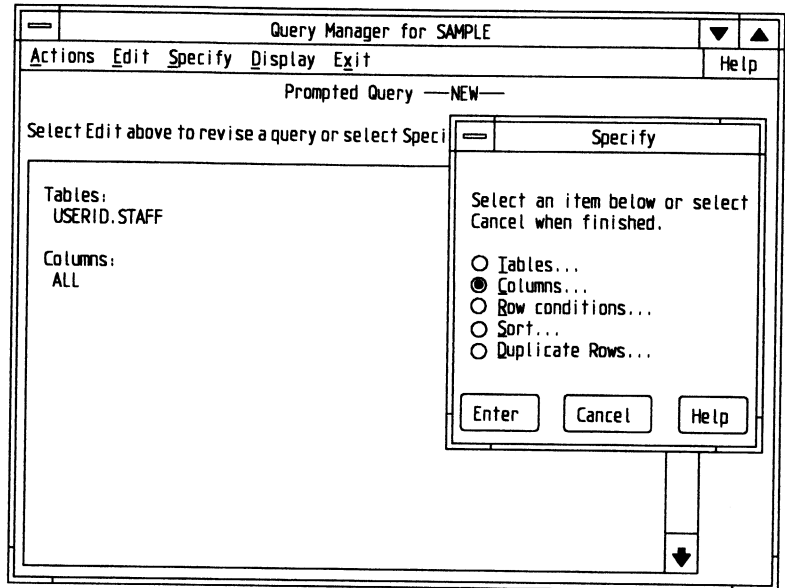
Note: You can select up to 15 tables in prompted query. When you select more than one table, you are asked for the join conditions that link the tables together. For information about joining tables, see the *User's Guide, Volume 3: Database Manager*.



4. Type STAFF in the Tables panel as shown in the previous illustration and select Enter. This specifies STAFF as the table that you want to query.

Note: You can also display a list of tables by selecting List and then selecting the STAFF table from the list of table names.

The Specify menu is displayed. The table name USERID.STAFF is displayed in the Prompted Query panel.

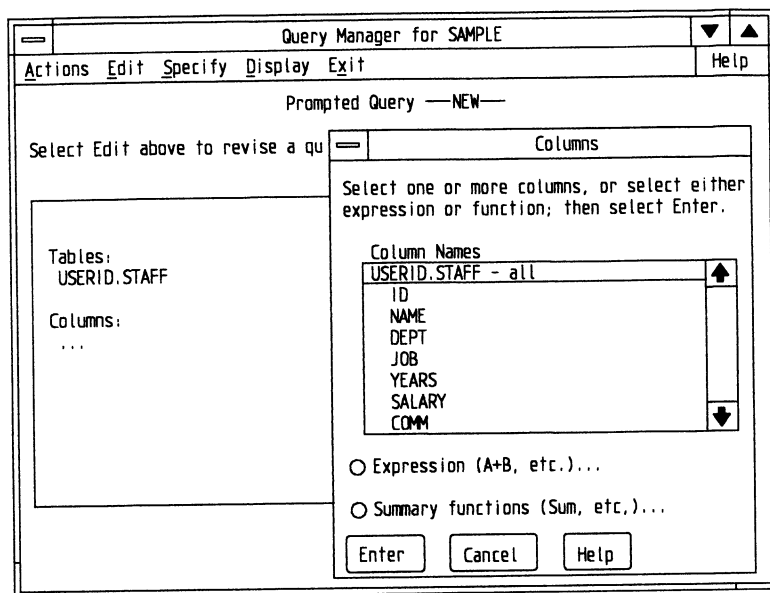


You are now ready to select the columns you want to include in your query. Notice that the cursor is currently on **Columns**, since this is usually what you want to specify next.

Notes:

- a. The qualifier may show the ID of the person who installed the database instead of USERID.
 - b. Prompted query guides you in creating a query by automatically displaying the Specify menu and displaying the next logical step in defining your query. If you want more information about an item in the Specify menu, highlight the item and select Help.
 - c. If you accidentally select Cancel and cancel the Specify menu, you can display it again by selecting **Specify** from the action bar.
5. Select **Columns** in the Specify menu and select Enter.

The Columns menu is displayed.



The Columns menu is a multiple-select menu. You can select all or a subset of all the columns in the table. For more information about selecting items from a multiple-select menu, see “Navigation Techniques” on page 1-3.

6. Select **NAME**, **DEPT**, **SALARY**, and **COMM** in the Columns menu and select Enter.

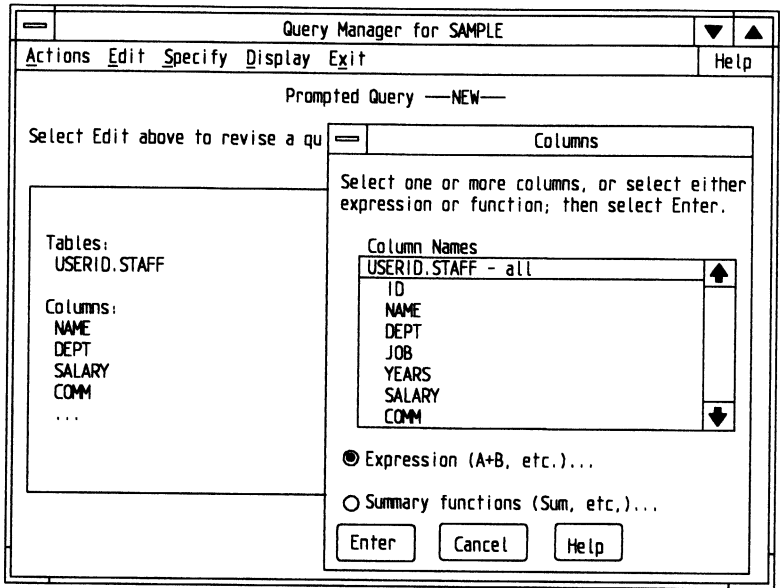
Note: If you wanted to select all the columns in the table, you would position your cursor on the table name (USERID.STAFF - all) and select Enter.

The Specify menu is displayed again.

For this exercise, you will write an *expression* for this query. With an expression, you can add, subtract, multiply, or divide the values in two or more columns and include the new values as a column in your query. The following steps show you how to define an expression of SALARY + COMM as part of a query.

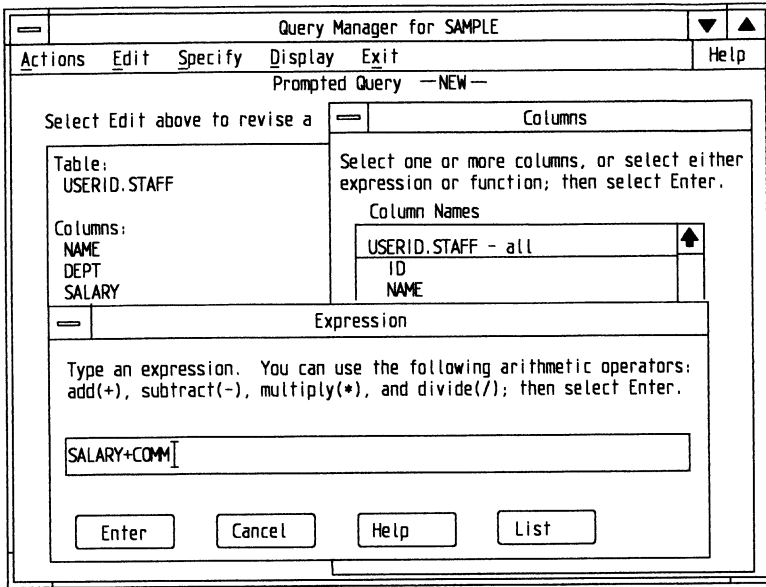
7. Select **Columns** in the Specify menu and select Enter.

The Columns menu is displayed again.



8. Select **Expression (A + B, etc.)...** in the Columns menu and select Enter.

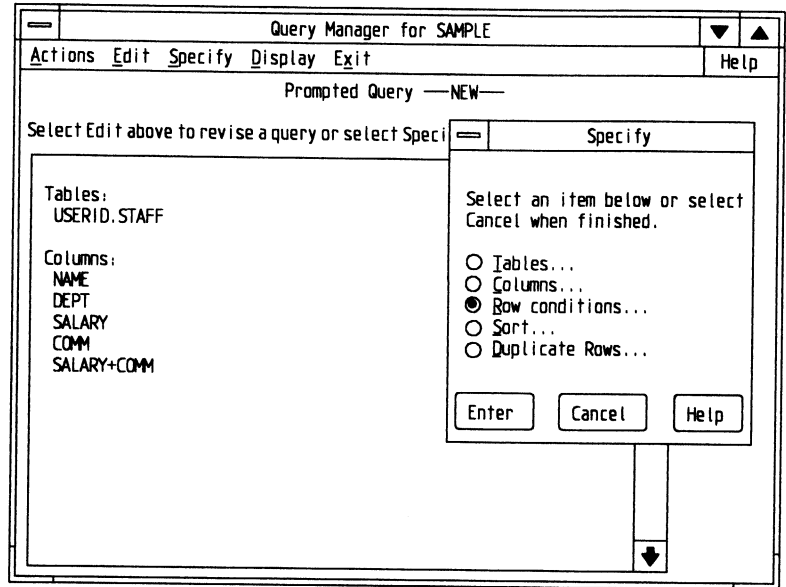
The Expression panel is displayed.



9. Type SALARY+COMM in the Expression panel as shown in the previous illustration and select Enter.

Note: Table column names are not case sensitive and can be typed using any combination of uppercase or lowercase letters. However, they are displayed in uppercase.

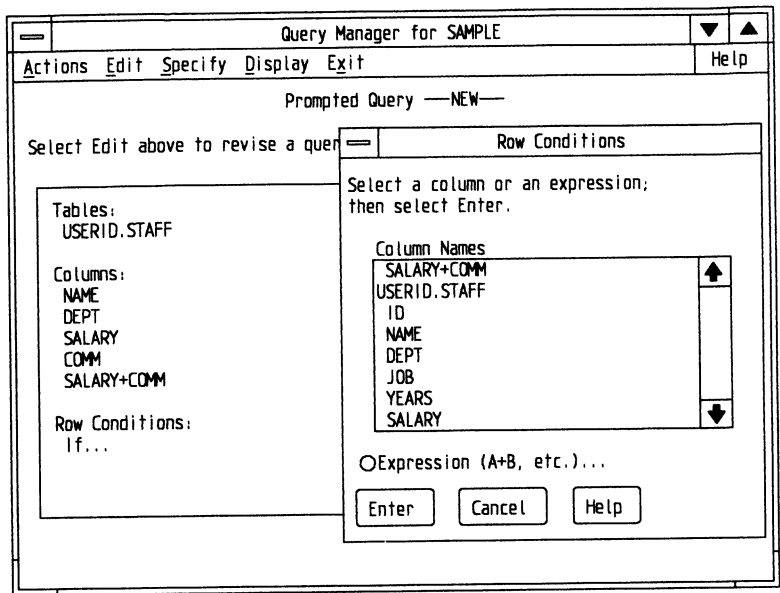
The Specify menu is displayed again.



To request data for employees, you need to specify *row conditions*, which are the qualifications that meet specific criteria.

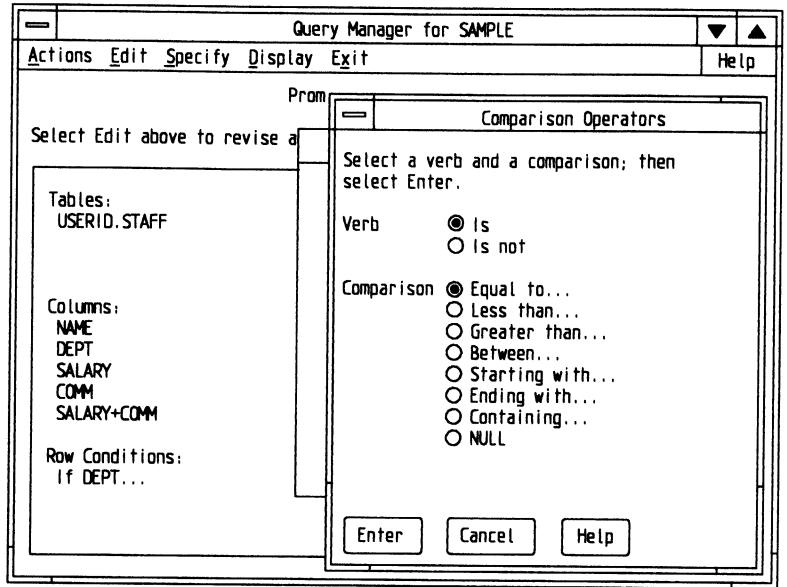
10. Select **Row conditions** in the Specify menu and select Enter.

The Row Conditions menu is displayed.



11. Select **DEPT** in the Row Conditions menu and select Enter.

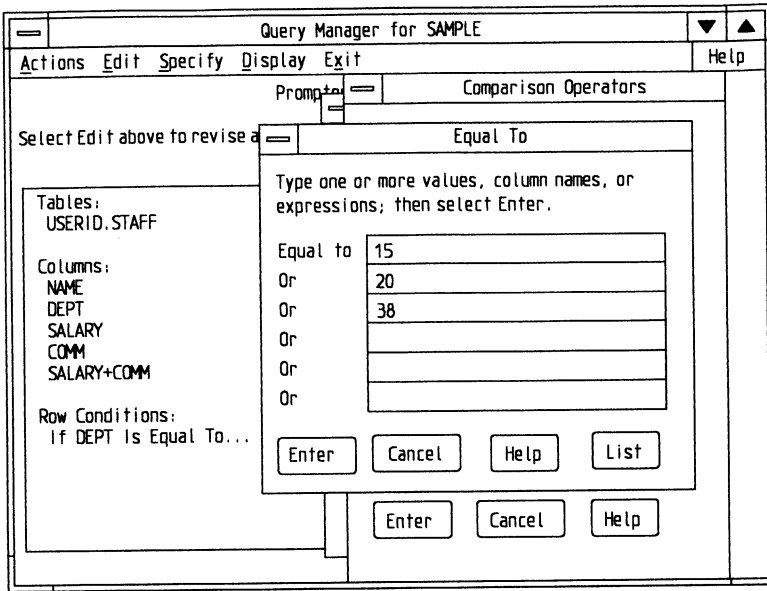
The Comparison Operators menu is displayed.



To get the information for departments 15, 20, and 38 only, you must specify the search criteria.

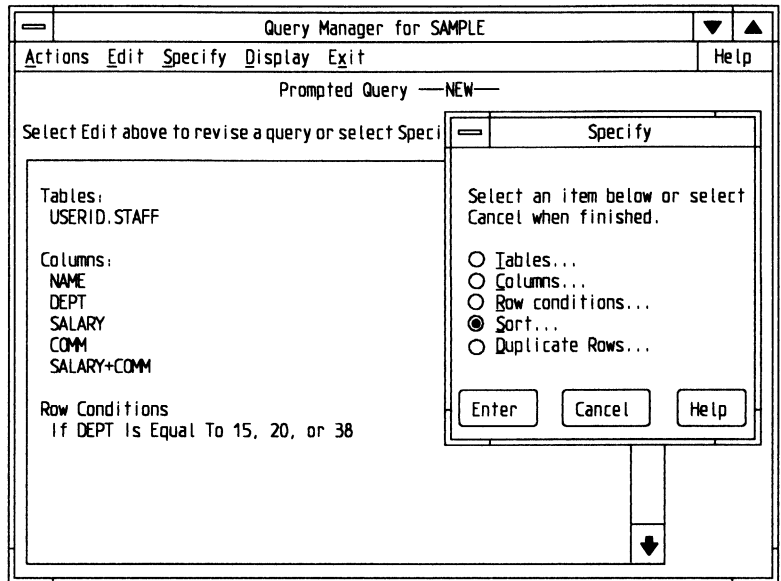
12. The default for **Verb** is **Is** and the default for **Comparison** is **Equal to**. Select **Enter** to accept them.

The Equal To panel is displayed.



13. Type 15, 20, 38 on the first three lines and select Enter.

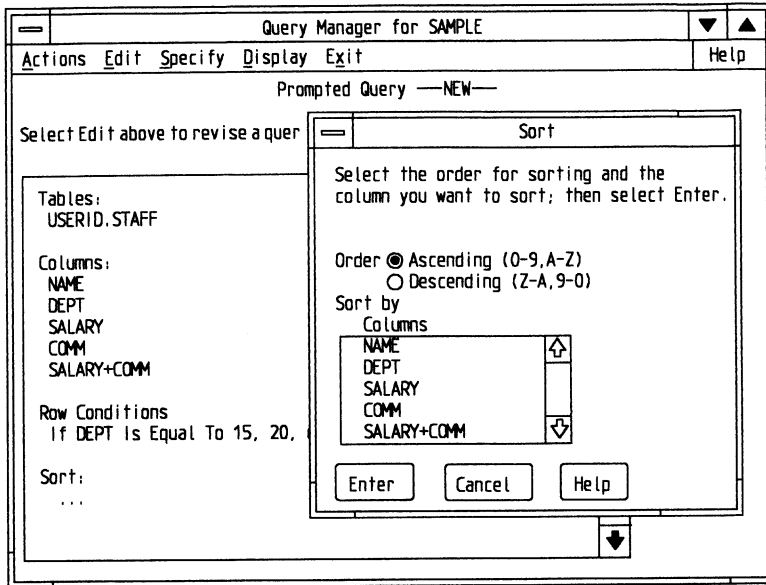
The Specify menu is displayed.



To show the departments in a particular order, you need to sort by department.

14. Select **Sort** in the Specify menu and select Enter.

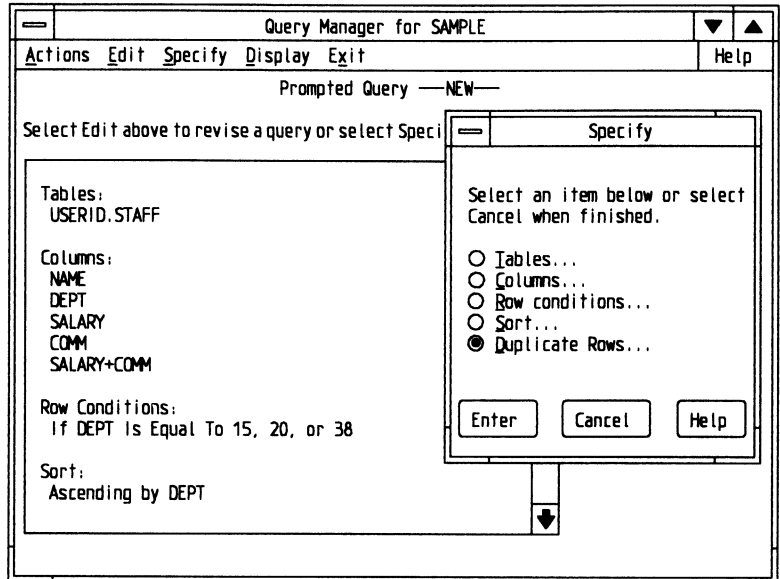
The Sort panel is displayed.



15. The default for **Order** is **Ascending (0-9, A-Z)**. Select **DEPT** in the Columns list and select Enter.

Note: If you are using a keyboard, press the Tab key to move to the Columns list.

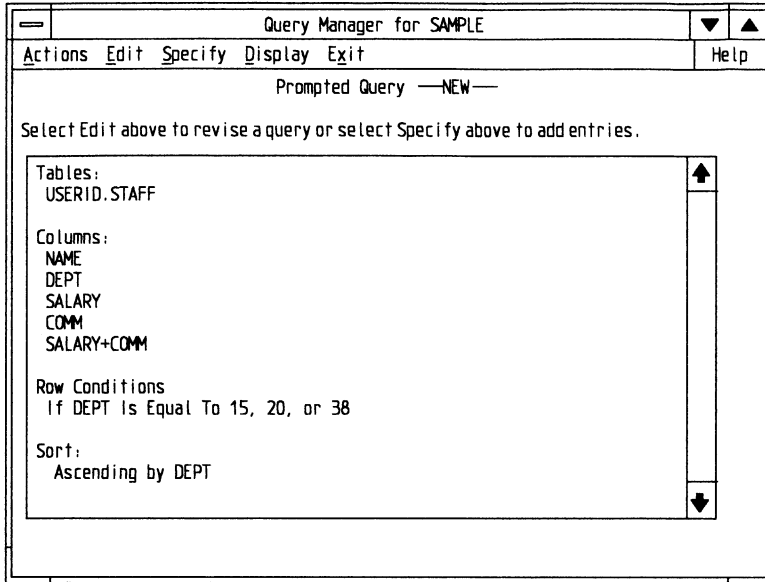
The Specify menu is displayed.



Duplicate Rows allows you to specify whether you want to keep all occurrences or keep only one occurrence of duplicate data in a query. The default is set to keep duplicate occurrences.

16. Select Cancel in the Specify menu to keep only duplicate occurrences.

The Prompted Query panel containing your completed query statement is displayed.

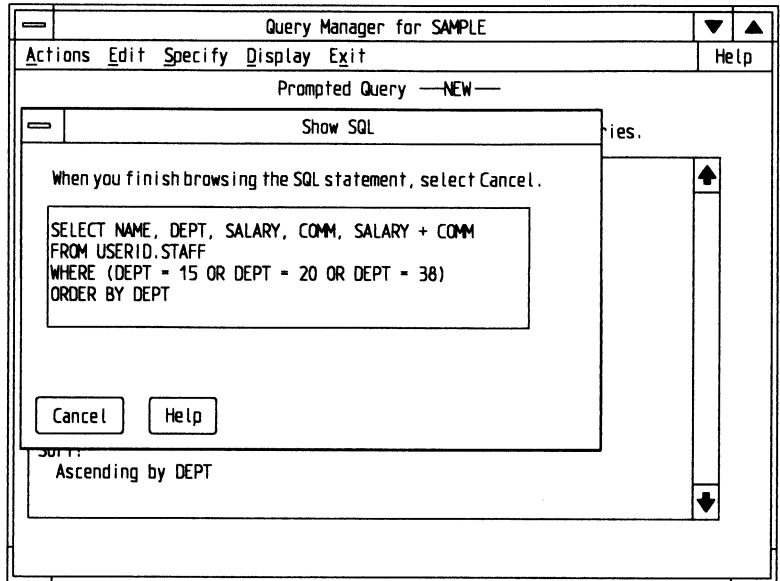


To Display SQL Statements

If you want to see the SQL statements that represent the query you created:

1. Select **Actions** from the action bar in the Prompted Query panel and then select **Show SQL** in the pull-down. Alternate method—Press the Show SQL (Shift + F7) key.

The Show SQL panel is displayed. It shows the SQL statements for the query that you created.



In the future you may want to create SQL statements to do tasks (such as creating queries, inserting, or updating data in a table) instead of using the prompted menus and panels you have been using in this exercise. For more information about using SQL statements, see the *User's Guide, Volume 3: Database Manager*.

2. Select Cancel in the Show SQL panel.

The Prompted Query primary panel is displayed.

You have completed creating your prompted query. Continue with "To Run the Query" on page 2-18.

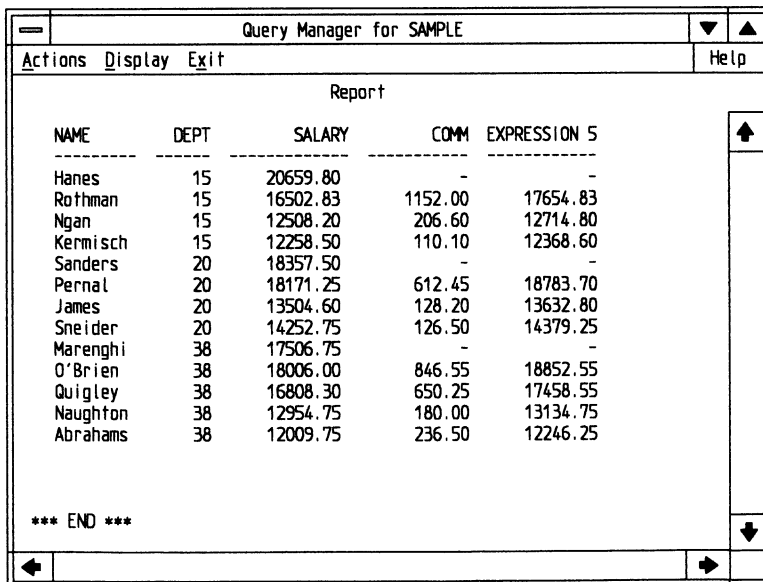
To Run the Query

You can run your query to see the data that it generates.

1. Select **Actions** from the action bar in the Prompted Query panel and then select **Run** in the pull-down. Alternate method—Press the Run (Shift + F1) key.

The Report panel is displayed. It shows the data that you requested in this prompted query.

Note: Notice the hyphen (-) in the **EXPRESSION 5** column for the name Hanes. The hyphen indicates a null value; reports always use hyphens for null values, even if you have indicated another symbol for null in your profile. One of the values in the **EXPRESSION 5 (SALARY + COMM)** column evaluated to null because one of the values in the expression (**COMM**) is null in the original table. In an expression, if one value is null, the expression computes to null. If you want the expression result to be a non-null value, you must enter the data into the table in that manner. For example, you would enter 0 for **COMM** instead of leaving the field blank. For more information on nulls, see the *User's Guide, Volume 3: Database Manager*.



The screenshot shows a window titled "Query Manager for SAMPLE". At the top, there is a menu bar with "Actions", "Display", "Exit", and "Help". Below the menu bar is a "Report" panel containing a table with the following columns: NAME, DEPT, SALARY, COMM, and EXPRESSION 5. The table lists 15 employees with their respective department numbers, salaries, commissions, and the result of the expression SALARY + COMM. The employee Hanes has a null value for COMM, resulting in a null value for EXPRESSION 5. The table ends with "*** END ***".

NAME	DEPT	SALARY	COMM	EXPRESSION 5
Hanes	15	20659.80	-	-
Rothman	15	16502.83	1152.00	17654.83
Ngan	15	12508.20	206.60	12714.80
Kermisch	15	12258.50	110.10	12368.60
Sanders	20	18357.50	-	-
Pernal	20	18171.25	612.45	18783.70
James	20	13504.60	128.20	13632.80
Sneider	20	14252.75	126.50	14379.25
Marenghi	38	17506.75	-	-
O'Brien	38	18006.00	846.55	18852.55
Quigley	38	16808.30	650.25	17458.55
Naughton	38	12954.75	180.00	13134.75
Abrahams	38	12009.75	236.50	12246.25

2. Check your results against the previous illustration. If your report matches the illustration, continue with the next section, “To Save the Query.”

If your report does not match, continue with steps 3 through 5 to correct your query.

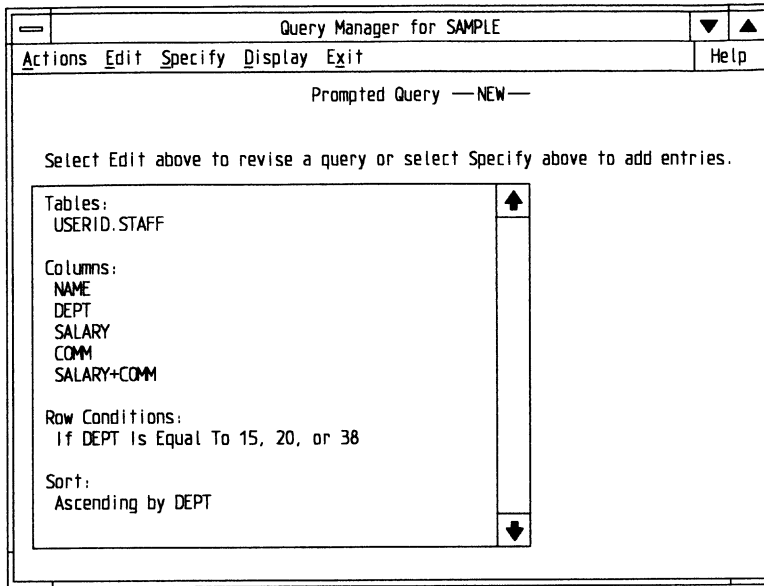
3. Select **Display** from the action bar and then select **Query** in the pull-down, to return to prompted query. Alternate method—Press the Query (Shift + F7) keys.
4. Select **Actions** from the action bar and then select **Refresh** in the Actions pull-down to clear your query and return to the Tables panel. Alternate method—Press the Refresh (F5) key.
5. Repeat “To Query a Table” starting at step 4 on page 2-4. When you have completed “To Query a Table,” repeat this procedure “To Run the Query” on page 2-18 to check that your report matches the previous illustration.

To Save the Query

If you are satisfied with the results from your query, save the query by giving it a name and an optional comment. You can then retrieve the query by its name and rerun or modify it.

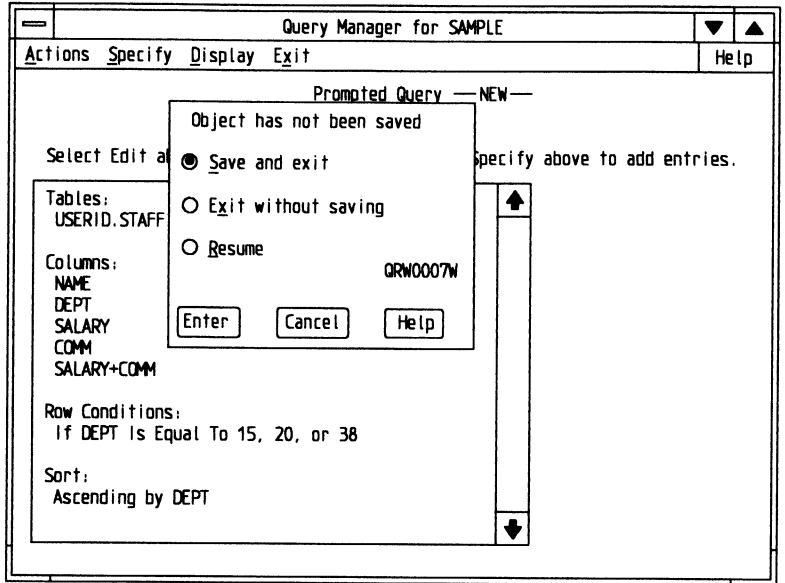
1. Select **Display** from the action bar in the Report panel and then select **Query** in the pull-down. Alternate method—Press the Query (Shift + F7) keys.

The Prompted Query panel is displayed.



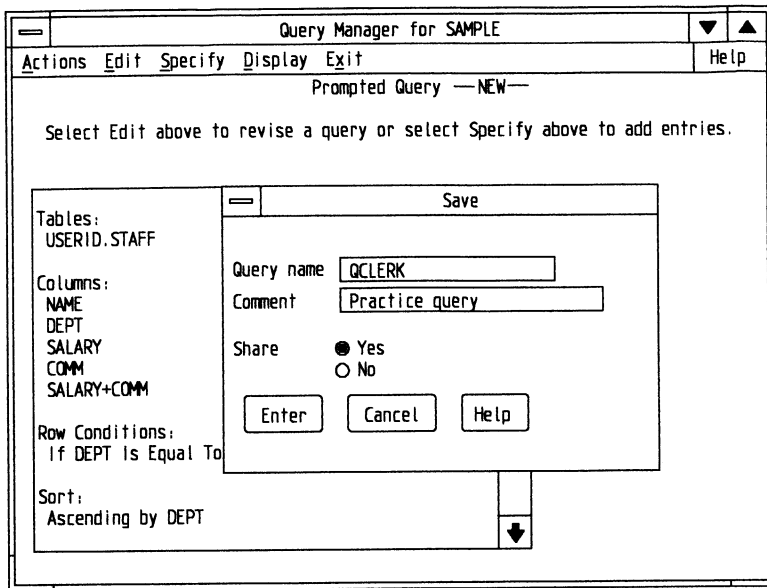
2. Select **Exit** from the action bar and then select **Exit Query** in the pull-down. Alternate method—Press the Exit Query (F3) key.

The following confirmation panel is displayed.



3. Select **Save and exit** and select **Enter**.

The Save panel is displayed.

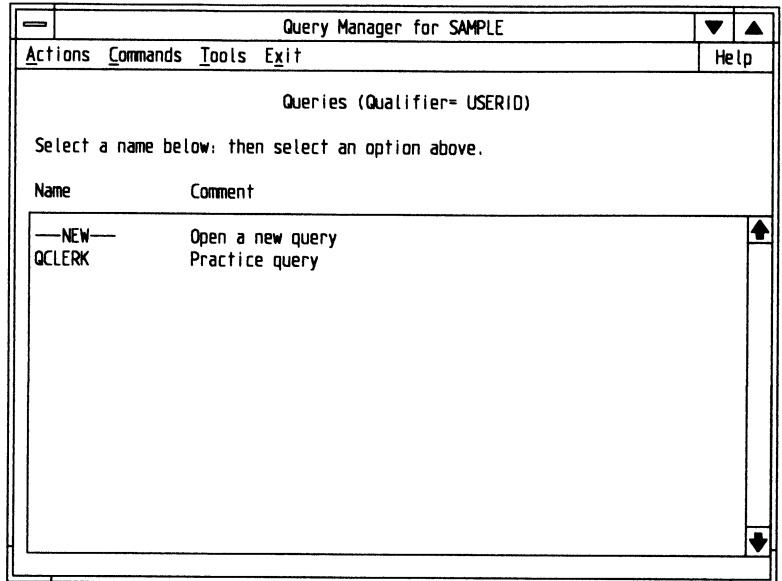


4. Type QCLERK for **Query name** and Practice query for **Comment** as shown in the illustration.

Share allows other users to access the query you have created if you have given them authority to do so.

5. Select **Yes** for **Share** and select Enter to save the query.

The Queries primary menu is displayed.



Notice that QCLERK is added to the Queries primary menu. (Other queries will be added alphabetically.) USERID is the active qualifier assigned to the objects you create.

6. Select **Exit** from the action bar in the Queries primary menu and then select **Exit Queries** in the pull-down. Alternate method—Press the Exit Queries (F3) key.

The Main Selection for SAMPLE menu is displayed.

7. Continue to "Exercise 2 - Revising the Report Form" on page 2-24 or press the Exit Query Manager (Shift + F3) key from the Main Selection for SAMPLE menu; then select **Yes** at the Confirmation panel to exit Query Manager and return to the Group-Main window.

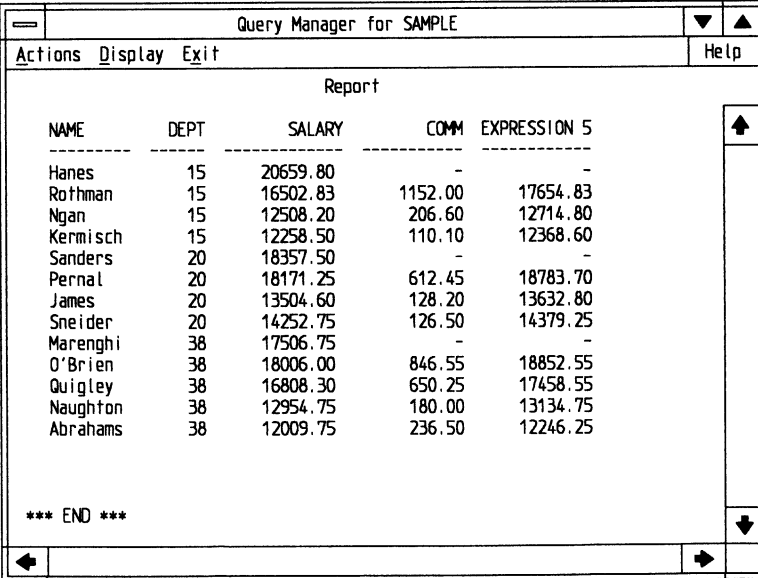
Exercise 2 - Revising the Report Form

In Exercise 1, you created and ran a prompted query requesting information from the STAFF table stored in the SAMPLE database. When the query was run, the results were displayed using the default report form. A report form is the definition of how the query results are to be displayed or printed.

Query Manager provides an extensive set of report-writing functions that you can use to revise and tailor the presentation of the data or query results in a report. By interacting with Query Manager forms, you can tailor the report with respect to the:

- Column order in which the data is presented
- Column headings and number of lines
- Length and spacing between each column
- Format and display of character data in columns
- Method of presentation of numeric data
- Heading, footing, break, and final text.

The following illustration of a report shows the results from the prompted query that you created in Exercise 1.



The screenshot shows a window titled "Query Manager for SAMPLE". Inside the window, there is a menu bar with "Actions", "Display", "Exit", and "Help". Below the menu bar, the word "Report" is centered. The report data is presented in a table with the following columns: NAME, DEPT, SALARY, COMM, and EXPRESSION 5. The data rows are as follows:

NAME	DEPT	SALARY	COMM	EXPRESSION 5
Hanes	15	20659.80	-	-
Rofhman	15	16502.83	1152.00	17654.83
Ngan	15	12508.20	206.60	12714.80
Kernisch	15	12258.50	110.10	12368.60
Sanders	20	18357.50	-	-
Pernal	20	18171.25	612.45	18783.70
James	20	13504.60	128.20	13632.80
Sneider	20	14252.75	126.50	14379.25
Marenghi	38	17506.75	-	-
O'Brien	38	18006.00	846.55	18852.55
Quigley	38	16808.30	650.25	17458.55
Naughton	38	12954.75	180.00	13134.75
Abrahams	38	12009.75	236.50	12246.25

At the bottom of the report, the text "*** END ***" is displayed. The window also features a vertical scrollbar on the right side and navigation arrows at the bottom.

To tailor the report to look the way you want, first run the query, look at the data in its default report format, and then use the various form options to change your default report form. This exercise shows you how to change your default report form.

It is possible to build the report form without running a query first if you know the information you want to display and the type of information in the table. Multiple queries can use the same form, and multiple forms can apply to the same query.

The following illustration shows the query from Exercise 1 with the changes that you will make in this exercise.

Query Manager for SAMPLE				
Action	Display	Exit	Help	
Report				
TOTAL EARNINGS REPORT				
06-08-1989				
DEPARTMENT	EMPLOYEE NAME	SALARY	COMMISSION	TOTAL EARNINGS
15	Hanes	\$20,659.80	-	-
	Rothman	\$16,502.83	\$1,152.00	\$17,654.83
	Ngan	\$12,508.20	\$206.60	\$12,714.80
	Kermisch	\$12,258.50	\$110.10	\$12,368.60
DEPT 15 Totals		\$61,929.33	\$1,468.70	\$42,738.23
20	Sanders	\$18,357.50	-	-
	Pernal	\$18,171.25	\$612.45	\$18,783.70
	James	\$13,504.60	\$128.20	\$13,632.80
	Sneider	\$14,252.75	\$126.50	\$14,379.25
DEPT 20 Totals		\$64,286.10	\$867.15	\$46,795.75
38	Marenghi	\$17,506.75	-	-
	O'Brien	\$18,006.00	\$846.55	\$18,852.55
	Quigley	\$16,808.30	\$650.25	\$17,458.55

To Use the Query-Report-Form Triangle

When you run a query without specifying a form, a report is generated using a default form. If the format of the report is not what you want, you can use the query-report-form triangle to go to the Form panel and modify the default form to change the appearance of your report.

Using a mouse or fast-path keys, you can navigate between the Report panel and the Form panel, making changes in the Form panel and then displaying the changes in the Report panel. For more

information on this function, see the *User's Guide, Volume 3: Database Manager*.

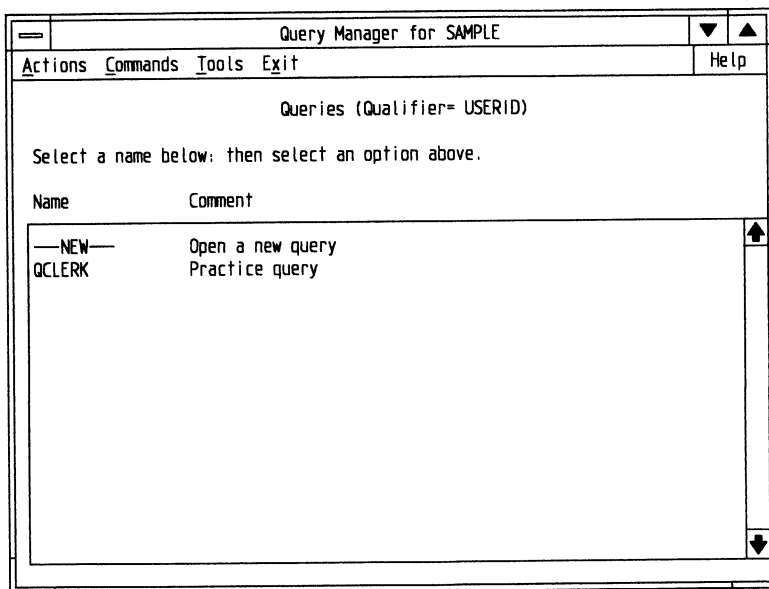
To Run a Saved Query

Before you can change the default report form in Exercise 1, you need to run the query. The steps to run the QCLERK query follow:

1. Select **Queries** in the Main Selection for SAMPLE menu.

Note: If necessary, see "Opening the Sample Database" on page 1-9 for steps to open the sample database and display the Main Selection for SAMPLE menu.

The Queries primary menu is displayed.



2. Select **QCLERK** in the Queries primary menu.
3. Select **Actions** from the action bar and then select **Run** in the pull-down. Alternate method—Press the Run (Shift + F1) key.

The QCLERK report, using the default report form, is displayed in the Report panel.

Query Manager for SAMPLE				
Actions Display Exit				Help
Report				
NAME	DEPT	SALARY	COMM	EXPRESSION 5
Hanes	15	20659.80	-	-
Rothman	15	16502.83	1152.00	17654.83
Ngan	15	12508.20	206.60	12714.80
Kermisch	15	12258.50	110.10	12368.60
Sanders	20	18357.50	-	-
Pernal	20	18171.25	612.45	18783.70
James	20	13504.60	128.20	13632.80
Sneider	20	14252.75	126.50	14379.25
Marenghi	38	17506.75	-	-
O'Brien	38	18006.00	846.55	18852.55
Quigley	38	16808.30	650.25	17458.55
Naughton	38	12954.75	180.00	13134.75
Abrahams	38	12009.75	236.50	12246.25
*** END ***				

Notice that **EXPRESSION 5** is the default column heading for the fifth column. It represents the expression (calculation) **SALARY + COMM** that you defined for your query in Exercise 1.

In the next part of this exercise, you will revise the **QCLERK** report to change the column headings and numeric data presentation and add heading, footing, and break text.

To Revise the Report Form

The first step in revising your report form is to add two-line column headings that are more descriptive than **NAME** and **EXPRESSION 5**. To create a two-line heading, type an underscore () at the point where you want the heading to split. You must type in uppercase if you want your column headings to display in uppercase.

1. Select **Display** from the action bar and then select **Form** in the pull-down. Alternate method—Press the Form (Shift + F5) key.

The Form panel is displayed, showing the default form definition.

The screenshot shows a window titled "Query Manager for SAMPLE". The window has a menu bar with "Actions", "Specify", "Display", "Exit", and "Help". Below the menu bar, it says "Form —NEW—". The main area contains a table with the following columns: "Num", "Column Heading", "Usage", "Indent", "Width", "Edit", and "Seq". The table has five rows of data:

Num	Column Heading	Usage	Indent	Width	Edit	Seq
1	NAME		2	9	C	1
2	DEPT		2	6	L	2
3	SALARY		2	10	L2	3
4	COMM		2	10	L2	4
5	EXPRESSION 5		2	12	L2	5

2. To change the column headings:
 - a. Type **EMPLOYEE_NAME** to replace **NAME** in the first line under Column Heading.
 - b. Move the cursor to the second line and type **DEPARTMENT** to replace **DEPT**.
 - c. Move the cursor to the fourth line and type **COMMISSION** to replace **COMM**.
 - d. Move the cursor to the fifth line and type **TOTAL_EARNINGS** to replace **EXPRESSION 5**.

The Form panel now displays the changes that you made in the preceding steps.

Query Manager for SAMPLE						
Actions Specify Display Exit						Help
Form —NEW—						
Num	Column Heading	Usage	Indent	Width	Edit	Seq
1	EMPLOYEE_NAME		2	9	C	1
2	DEPARTMENT		2	6	L	2
3	SALARY		2	10	L2	3
4	COMMISSION		2	10	L2	4
5	TOTAL_EARNINGS		2	12	L2	5

Note: Usage, Indent, Width, Edit, and Seq change the format of the columns.

- **Usage** defines a specific action to be taken on a column, such as a calculation.
- **Indent** specifies the number of spaces that the heading for a column and the data under it will be indented.
- **Width** specifies the width of a column.
- **Edit** specifies the data in a column as either character data or numeric data. In numeric data, the edit code allows you to specify the format of your data with desired characters, such as dollar signs, percent signs, and the number of decimal positions. You may choose to use an edit code to display the date and time, either in a customized format or in the format your workstation is using.
- **Seq** allows you to change the left-to-right order or sequence in which the columns are displayed in your report.

For more information on how to use these columns, see the *User's Guide, Volume 3: Database Manager* or select Help.

3. To group, add, and display the salary information by department:
 - a. Type **BREAK1** in the **Usage** column for **DEPARTMENT**. **BREAK1** will separate your report by department number.
 - b. Type **SUM** in the **Usage** column for **SALARY**, **COMMISSION**, and **TOTAL_EARNINGS**. **SUM** will give you the total of the values in each column.
 - c. Type **10** in the **Width** column for **EMPLOYEE_NAME** and **DEPARTMENT** and type **11** for **SALARY**. This will expand the width of these columns to accommodate the longer column headings and the numeric edits, such as commas and dollar signs.
4. Type **D2** in the **Edit** column for **SALARY**, **COMMISSION**, and **TOTAL_EARNINGS**. **D2** formats these fields with a currency symbol (\$) and a thousands separator (,).
5. To change the order in which the columns are displayed:
 - a. Type **2** in the **Seq** column for **EMPLOYEE_NAME**.
 - b. Type **1** in the **Seq** column for **DEPARTMENT**.

The last three columns remain in their present order; therefore, no change is required for them.

The Form panel now displays the changes that you made in the preceding steps.

Query Manager for SAMPLE						
Actions Specify Display Exit						Help
Form —NEW—						
Num	Column Heading	Usage	Indent	Width	Edit	Seq
1	EMPLOYEE_NAME		2	10	C	2
2	DEPARTMENT	BREAK1	2	10	L	1
3	SALARY	SUM	2	11	D2	3
4	COMMISSION	SUM	2	10	D2	4
5	TOTAL_EARNINGS	SUM	2	12	D2	5

Note: You can press the Display Report (Shift + F6) key to look at the report with the changes you have made to the form. After displaying the report, you can press the Display Form (Shift + F5) key to make more changes to your report form options. You can press the Display Report (Shift + F6) key at any time while you are revising your report form.

To define the format of numeric or character fields, you can use Edit codes. They can format character data, such as wrapping a string of characters according to the width defined for the column. They can also format numeric data as you will do in the next few steps.

6. Select **Specify** from the action bar and then select **Page** in the pull-down.

The Page Text panel is displayed.

The screenshot shows a window titled "Query Manager for SAMPLE" with a menu bar containing "Actions", "Specify", "Display", "Exit", and "Help". The main area displays a table with the following data:

Num	Column Name	Seq
1	EMPLOYEE	2
2	DEPARTME	1
3	SALARY	3
4	COMMISSI	4
5	TOTAL_EA	5

Overlaid on this table is a "Page Text" dialog box. The dialog box has a title bar "Form — NEW —" and a "Page Text" title. It contains the following settings:

- Blank lines before heading: 0
- Blank lines after heading: 2
- Heading text: Yes... No
- Blank lines before footing: 2
- Blank lines after footing: 0
- Footing text: Yes... No

At the bottom of the dialog box are three buttons: "Enter", "Cancel", and "Help".

7. Select **Yes** for **Heading text**; then select **Yes** for **Footing text** and select **Enter**.

The Heading and Footing Text Lines panel is displayed.

The screenshot shows a window titled "Query Manager for SAMPLE" with a menu bar containing "Actions", "Specify", "Display", "Exit", and "Help". Below the menu bar is a label "Form —NEW—". The main content area displays a panel titled "Heading and Footing Text Lines".

The panel contains two tables:

Line	Align	Heading Text
1	Center	
2	Center	
3	Center	
4	Center	
5	Center	

Line	Align	Footing Text
1	Center	
2	Center	
3	Center	
4	Center	
5	Center	

At the bottom of the panel are four buttons: "Enter", "Cancel", "Help", and "List".

8. To set the **Heading text**:

- a. Type TOTAL EARNINGS REPORT in the Line 2 **Heading Text** column. This will leave one blank line on the top of the report prior to the start of the report heading.

Note: You must type in uppercase to display your title in uppercase.

- b. Type &DATE in the Line 3 **Heading Text** column. This will print the system date that is set in your profile.

9. To set the **Footing text**:

- a. Type LEFT in the Line 1 **Align** column and use the Delete key to remove the remaining characters.
- b. Type COMPANY CONFIDENTIAL in the Line 1 **Footing Text** column.

The Heading and Footing Text panel now displays the changes you made in the preceding steps.

Query Manager for SAMPLE

Actions Specify Display Exit Help

Form —NEW—

Line	Align	Heading Text
1	Center	
2	Center	TOTAL EARNINGS REPORT
3	Center	&DATE
4	Center	
5	Center	

Line	Align	Footing Text
1	LEFT	COMPANY CONFIDENTIAL
2	Center	
3	Center	
4	Center	
5	Center	

Enter Cancel Help List

10. Select Enter.

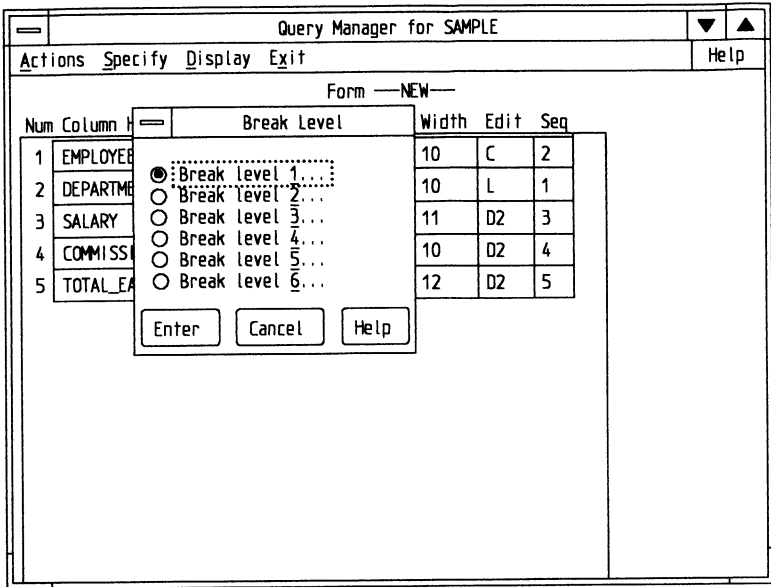
The Form panel is displayed.

The screenshot shows a window titled "Query Manager for SAMPLE". The window has a menu bar with "Actions", "Specify", "Display", "Exit", and "Help". Below the menu bar is a "Form —NEW—" panel. This panel contains a table with the following columns: "Num", "Column Heading", "Usage", "Indent", "Width", "Edit", and "Seq". The table has five rows of data:

Num	Column Heading	Usage	Indent	Width	Edit	Seq
1	EMPLOYEE_NAME		2	10	C	2
2	DEPARTMENT	BREAK1	2	10	L	1
3	SALARY	SUM	2	11	D2	3
4	COMMISSION	SUM	2	10	D2	4
5	TOTAL_EARNINGS	SUM	2	12	D2	5

11. Select **Specify** from the action bar and then select **Breaks** in the pull-down.

The Break Level menu is displayed.



12. Select **Break level 1** and then select Enter.

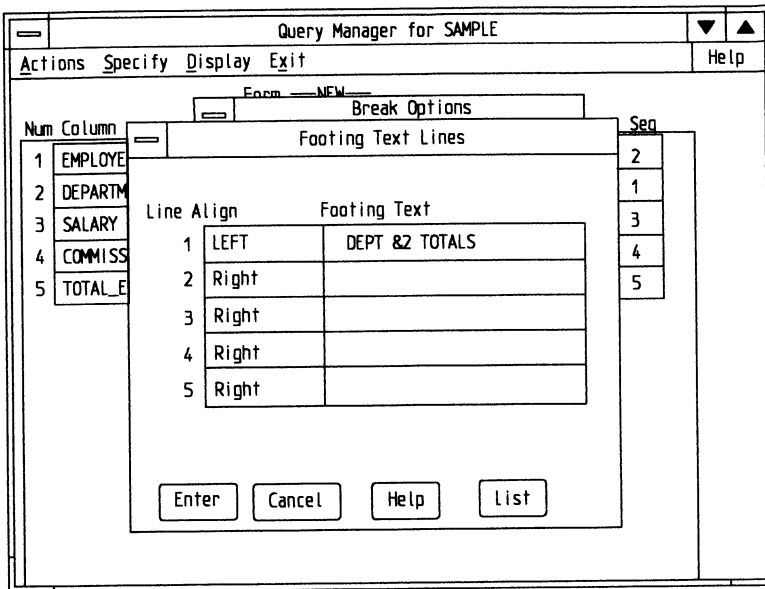
The Break Options panel is displayed.

Num	Column	Break level	1	Seq
1	EMPLOYEE	New page for break	<input type="radio"/> Yes <input checked="" type="radio"/> No	2
2	DEPARTMENT	Repeat column heading	<input type="radio"/> Yes <input checked="" type="radio"/> No	1
3	SALARY	Blank lines before heading	<input type="text" value="0"/>	3
4	COMMISSION	Blank lines after heading	<input type="text" value="0"/>	4
5	TOTAL	Heading text	<input type="radio"/> Yes <input checked="" type="radio"/> No	5
		New page for footing	<input type="radio"/> Yes <input checked="" type="radio"/> No	
		Put break summary at line	<input type="text" value="1"/>	
		Blank lines before footing	<input type="text" value="0"/>	
		Blank lines after footing	<input type="text" value="1"/>	
		Footing text	<input checked="" type="radio"/> Yes <input type="radio"/> No	

Buttons: Enter, Cancel, Help

13. Select **No** for **Heading text**; then select **Yes** for **Footing text** and select Enter.

The Footing Text Lines panel is displayed.



14. Type LEFT in the Line 1 **Align** column and use the Delete key to remove the remaining character.
15. Type DEPT &2 TOTALS in the Line 1 **Footing Text** column and select Enter.

Note: To have the appropriate department number print for each department total, you must specify a special symbol, &2. The &2 is a variable that is replaced by the current value in the second column of the data from the query, the DEPARTMENT number column, of the STAFF table.

The Break Level menu is displayed again.

16. Select Cancel, or press the Cancel (Esc) key.

The Form panel is displayed.

The screenshot shows a window titled "Query Manager for SAMPLE". The window has a menu bar with "Actions", "Specify", "Display", and "Exit". A "Help" button is located in the top right corner. Below the menu bar, the text "Form —NEW—" is displayed. A table with the following columns: "Num", "Column Heading", "Usage", "Indent", "Width", "Edit", and "Seq" is shown. The table contains five rows of data.

Num	Column Heading	Usage	Indent	Width	Edit	Seq
1	EMPLOYEE_NAME		2	10	C	2
2	DEPARTMENT	BREAK1	2	10	L	1
3	SALARY	SUM	2	11	D2	3
4	COMMISSION	SUM	2	10	D2	4
5	TOTAL_EARNINGS	SUM	2	12	D2	5

Now you can display the revised report with all the changes you have made.

17. Select **Display** from the action bar and then select **Report** in the pull-down. Alternate method—Press the Report (Shift + F6) key.

The revised report is displayed in the Report panel.

Query Manager for SAMPLE				
Action Display Exit				Help
Report				
TOTAL EARNINGS REPORT				
06-08-1989				
DEPARTMENT	EMPLOYEE NAME	SALARY	COMMISSION	TOTAL EARNINGS
15	Hanes	\$20,659.80	—	—
	Rothman	\$16,502.83	\$ 1,152.00	\$17,654.83
	Ngan	\$12,508.20	\$ 206.60	\$12,714.80
	Kermisch	\$12,258.50	\$ 110.10	\$12,368.60
DEPT 15 Totals		\$61,929.33	\$1,468.70	\$42,738.23
20	Sanders	\$18,357.50	—	—
	Pernal	\$18,171.25	\$ 612.45	\$18,783.70
	James	\$13,504.60	\$ 128.20	\$13,632.80
	Sneider	\$14,252.75	\$ 126.50	\$14,379.25
DEPT 20 Totals		\$64,286.10	\$ 867.15	\$46,795.75
38	Marenghi	\$17,506.75	—	—
	O'Brien	\$18,006.00	\$ 846.55	\$18,852.55
	Quigley	\$16,808.30	\$ 650.25	\$17,458.55

Note: Use the scrollbar or press the PgDn key to display the portion of the report that is not currently displayed.

- Check your results against the preceding illustration. If your results match, continue with the next section, "To Print the Report" on page 2-41.

Note: The data in the report may not match the example, if someone has previously changed the table data.

If your results do not match, continue with step 19.

Note: In the introduction to these exercises, on page 2-25, the query-report-form triangle was discussed. You may want to take advantage of this function as you revise your form. You can make the necessary changes to a query or form by switching back and forth from query to form to report. If you do modify a query, you must run it again. For more information on the query-report-form triangle, see the *User's Guide, Volume 3: Database Manager*.

- Select **Display** from the action bar and then select **Form** in the pull-down. Alternate method—Press the Form (Shift + F5) key.

The Form panel is displayed.

20. Select **Actions** from the action bar and then select **Refresh** in the pull-down. Alternate method—Press the Refresh (F5) key.

This clears your form and the default report form is displayed again.

21. Repeat the steps in this exercise, making the necessary changes until your results match the preceding illustration.

To Print the Report

1. Select **Actions** from the action bar in the Report panel and then select **Print** in the pull-down. Alternate method—Press the Print (F9) key.

Query Manager for SAMPLE				
Action Display Exit				Help
Save data... Shift+F2	Report			
Print... F9	TOTAL EARNINGS REPORT			
Graph... Shift+F4	06-08-1989			
DEPARTMENT	EMPLOYEE NAME	SALARY	COMMISSION	TOTAL EARNINGS
15	Hanes	\$20,659.80	—	—
	Rothman	\$16,502.83	\$1,152.00	\$17,654.83
	Ngan	\$12,508.20	\$ 206.60	\$12,714.80
	Kermisch	\$12,258.50	\$ 110.10	\$12,368.60
DEPT 15	Totals	\$61,929.33	\$1,468.70	\$42,738.23
20	Sanders	\$18,357.50	—	—
	Pernal	\$18,171.25	\$ 612.45	\$18,783.70
	James	\$13,504.60	\$ 128.20	\$13,632.80
	Sneider	\$14,252.75	\$ 126.50	\$14,379.25
DEPT 20	Totals	\$64,286.10	\$ 867.15	\$46,795.75
38	Marengi	\$17,506.75	—	—
	O'Brien	\$18,006.00	\$ 846.55	\$18,852.55
	Quigley	\$16,808.30	\$ 650.25	\$17,458.55

The Print menu is displayed.

Query Manager for SAMPLE

Action Display Exit Help

Report

TOTAL EARNINGS REPORT

Print

To file..

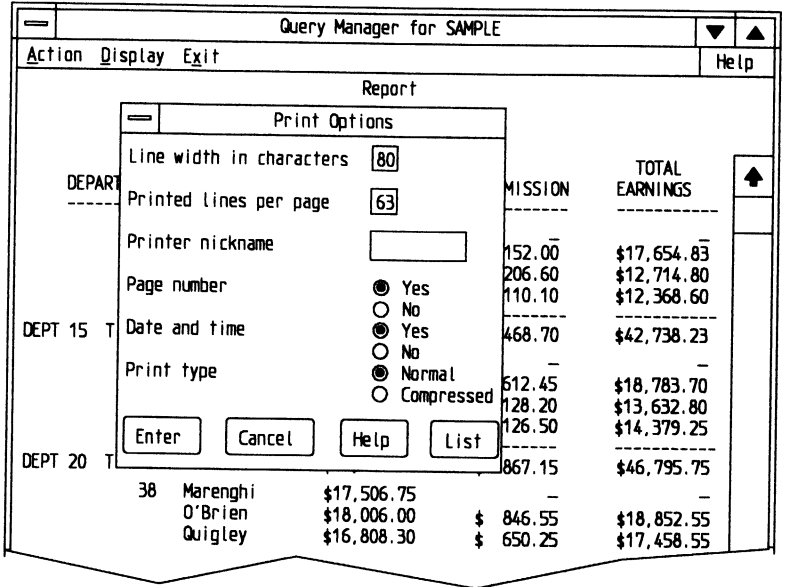
To printer...

Enter Cancel Help

DEPARTMENT		COMMISSION	TOTAL EARNINGS
1	Ngan	\$1,152.00	\$17,654.83
		\$ 206.60	\$12,714.80
	Kermisch	\$ 110.10	\$12,368.60
DEPT 15	Totals	\$61,929.33	\$1,468.70
20	Sanders	\$18,357.50	-
	Pernal	\$ 612.45	\$18,783.70
	James	\$ 128.20	\$13,632.80
	Sneider	\$ 126.50	\$14,379.25
DEPT 20	Totals	\$64,286.10	\$ 867.15
38	Marengi	\$17,506.75	-
	O'Brien	\$ 846.55	\$18,852.55
	Quigley	\$ 650.25	\$17,458.55

2. Select **To printer** and then select Enter.

The Print Options panel is displayed.



3. It is not necessary to change any print options. Select Enter to print this report and return to the Report panel.

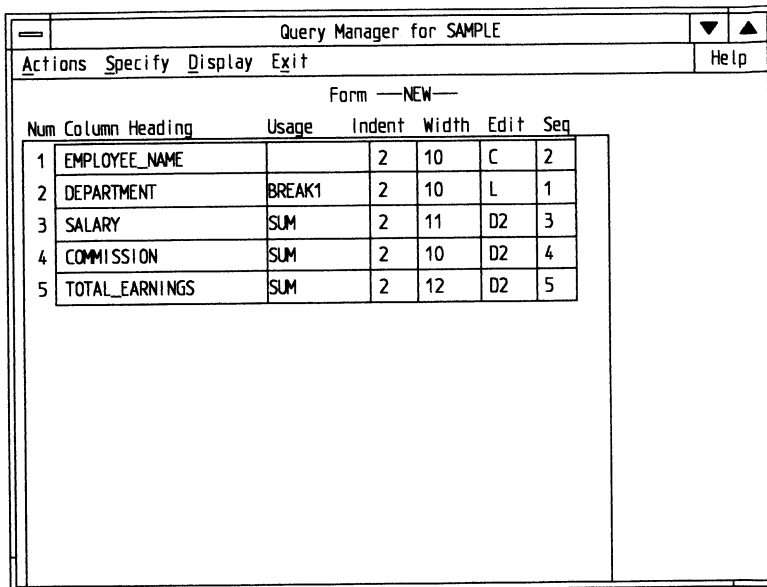
Note: To print this report in a compressed format, select **Compressed** for **Print Type** in the Print Options panel. For more information on saving the report data in a table or on graphing report data, see the *User's Guide, Volume 3: Database Manager*.

To Save the Revised Report Form

If you are satisfied with the revised report form, you can save it for future use.

1. Select **Display** from the action bar in the Report panel and then select **Form** in the pull-down. Alternate method—Press the Form (Shift + F5) key.

The Form panel is displayed.



Query Manager for SAMPLE

Form —NEW—

Num	Column Heading	Usage	Indent	Width	Edit	Seq
1	EMPLOYEE_NAME		2	10	C	2
2	DEPARTMENT	BREAK1	2	10	L	1
3	SALARY	SUM	2	11	D2	3
4	COMMISSION	SUM	2	10	D2	4
5	TOTAL_EARNINGS	SUM	2	12	D2	5

2. Select **Exit** from the action bar and then select **Exit Form** in the pull-down. Alternate method—Press the Exit Form (F3) key.

The following confirmation panel is displayed.

Query Manager for SAMPLE

Actions Specify Display Exit Help

Form —NEW—

Object has not been saved

Save and exit

Exit without saving

Resume

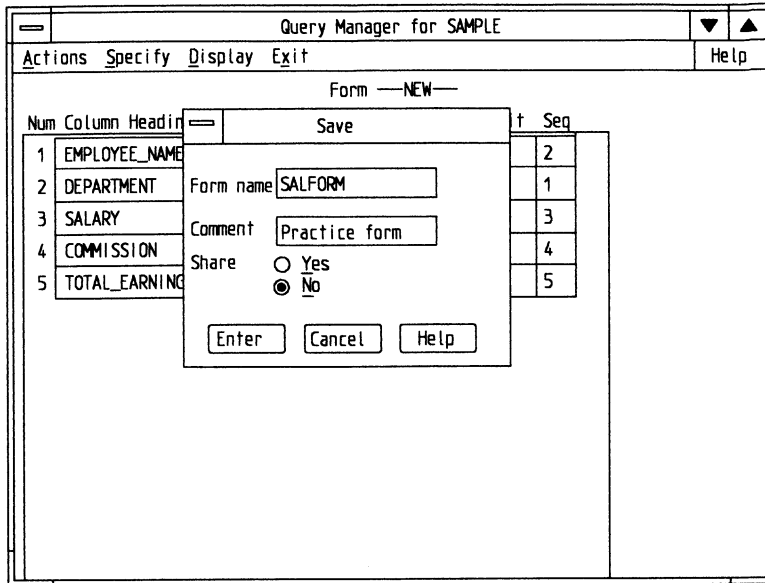
QRW0007W

Enter Cancel Help

Num	Column head	Edit	Seq
1	EMPLOYEE_NA	C	2
2	DEPARTMENT	L	1
3	SALARY	D2	3
4	COMMISSION	D2	4
5	TOTAL_EARNI	D2	5

3. Select **Save and exit** and then select Enter.

The Save panel is displayed.

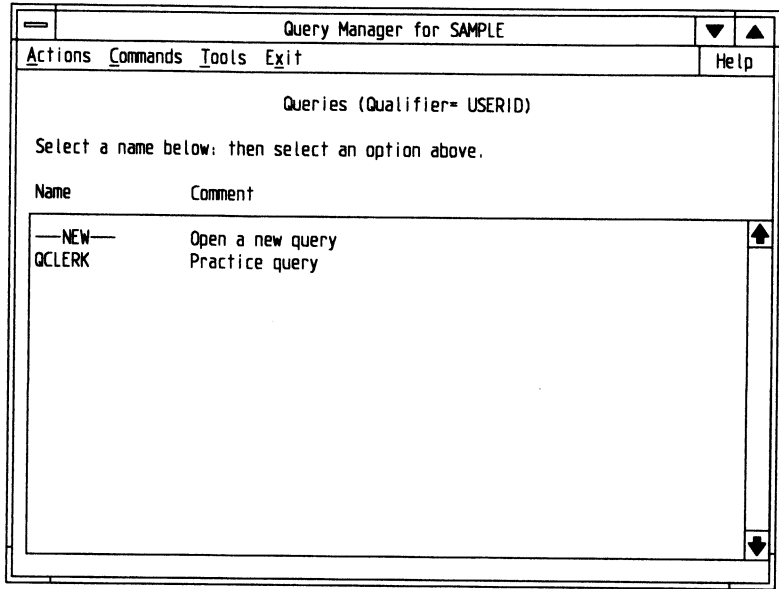


4. Type SALFORM for **Form name** and Practice form for **Comment** as shown in the illustration.

Note: If you want to give other users access to this report, select **Yes** for the **Share** option. However, since you will be erasing the sample database tables after you complete these exercises, accept the default of **No** for the **Share** option at this time.

5. Select Enter to save the form.

The Queries primary menu is displayed.



Note: You will not see the form name SALFORM on the Queries primary menu. To see all your Form objects, go to the Main Selection for SAMPLE menu and select **Forms**.

To Use an Existing Report Form to Display Query Results

Now that you have created a new report form definition, you can use it repeatedly. You do not have to specify the report form each time you run the query.

To illustrate how to use existing report forms for a query, complete the following steps:

1. Select the **QCLERK** query from the Queries primary menu.
2. Select **Actions** from the action bar and select **Run using** in the pull-down.
3. Select List in the Run Using panel to display a list of report form names.

4. Select **SALFORM** from the list that is displayed and then select Enter.

SALFORM is displayed in the Run Using panel.

5. Select Enter to display the report.

Query Manager for SAMPLE				
Action	Display	Exit	Help	
Report				
TOTAL EARNINGS REPORT 06-08-1989				
DEPARTMENT	EMPLOYEE NAME	SALARY	COMMISSION	TOTAL EARNINGS
15	Hanes	\$20,659.80		
	Rothman	\$16,502.83	\$1,152.00	\$17,654.83
	Ngan	\$12,508.20	\$ 206.60	\$12,714.80
	Kermisch	\$12,258.50	\$ 110.10	\$12,368.60
DEPT 15 Totals		\$61,929.33	\$1,468.70	\$42,738.23
20	Sanders	\$18,357.50		
	Pernal	\$18,171.25	\$ 612.45	\$18,783.70
	James	\$13,504.60	\$ 128.20	\$13,632.80
	Sneider	\$14,252.75	\$ 126.50	\$14,379.25
DEPT 20 Totals		\$64,286.10	\$ 867.15	\$46,795.75
38	Marengi	\$17,506.75		
	O'Brien	\$18,006.00	\$ 846.55	\$18,852.55
	Quigley	\$16,808.30	\$ 650.25	\$17,458.55

6. Select **Exit** from the action bar and then select **Exit Report** in the pull-down. Alternate method—Press the Exit Report (F3) key.

The Queries primary menu is displayed.

7. Select **Exit** from the action bar and then select **Exit Queries** in the pull-down. Alternate method—Press the Exit Queries (F3) key.

The Main Selection for SAMPLE menu is displayed.

8. Continue to “Exercise 3 - Adding Data to a Table” on page 2-49, or press the Exit Query Manager (Shift + F3) key to return to the Group-Main window.

Exercise 3 - Adding Data to a Table

The process used for adding data to an existing table is identical to that used for adding data to a new table. Data added to a table is also added to the database.

In this exercise, you have hired new people and need to add them to your STAFF table. You are adding the following employee data to the STAFF table.

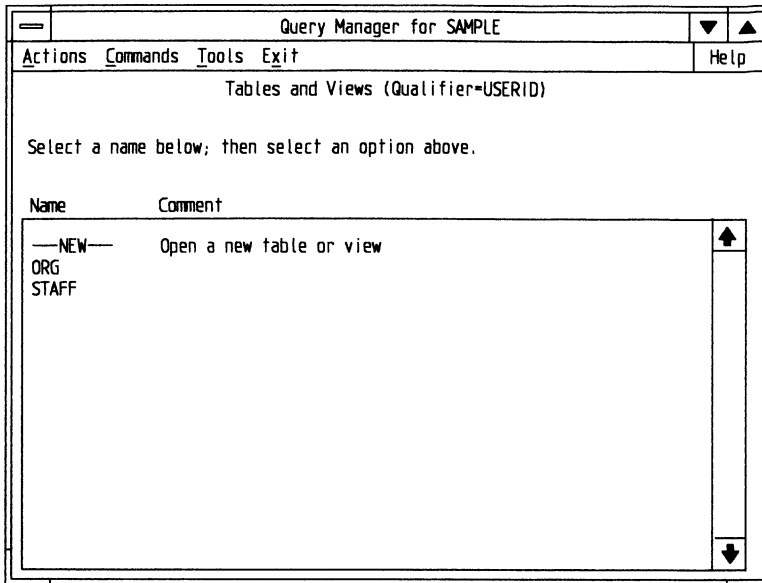
ID	NAME	DEPT	JOB	YEARS	SALARY	COMM
360	Johnson	51	Clerk	0	10000.00	1000.00
370	Hart	51	Sales	0	30000.00	2100.00

To add data to a table, you must first select the table from the database where it is located. For this exercise, select the STAFF table in the SAMPLE database. You will add data to the STAFF table by typing the new data on panels that contain all the columns for the table.

1. Select **Tables and Views** in the Main Selection for SAMPLE menu.

Note: If necessary, see "Opening the Sample Database" on page 1-9 for steps to open the sample database and display the Main Selection for SAMPLE menu.

The Tables and Views primary menu is displayed.



2. Select **STAFF** in the Tables and Views primary menu as the table you want to add data into.
3. Select **Actions** from the action bar and then select **Add data rows** in the pull-down. Alternate method—Press the Add Data Rows (Ctrl + F2) key.

The Add Data into STAFF panel is displayed.

Note: The value for each column in a row is initially displayed as the default null character, a hyphen (-). The null character indicates that no value has been entered. You can also specify another character (such as #) as the null character by changing your profile. For more information on profiles, see the *User's Guide, Volume 3: Database Manager*.

Query Manager for SAMPLE

Actions Exit Help

Add Data into STAFF

Complete by typing; then select from Actions above or press Ctrl+F2 to add this row and display a blank row.

ID	360
NAME	Johnson
DEPT	51
JOB	Clerk
YEARS	0
SALARY	10000.00
COMM	1000.00

4. Type 360 as the value for the first column and then type the remaining values for each column as shown in the illustration.

Note: Ensure that you are in Replace mode. Insert mode retains the hyphen and stores it as data if this field has been defined as a character field and data is required. If you have defined a character column where data is not required and the null character (hyphen) is the only thing in the field, then the null character is stored in the column.

Type data in mixed case so that the data entered will be compatible with the data already entered into the STAFF table.

5. Select **Actions** from the action bar and then select **Add and next** in the pull-down. Alternate method—Press the Add and Next (Ctrl + F2) keys.

A message is displayed informing you that the data row was added to the table. This message is automatically removed when you move the cursor to the next entry field.

The Add Data into STAFF panel is displayed again.

Query Manager for SAMPLE

Actions Exit Help

Add Data into STAFF

Complete by typing; then select from Actions above or press Ctrl+F2 to add this row and display a blank row.

ID	370
NAME	Hart
DEPT	51
JOB	Sales
YEARS	0
SALARY	30000.00
COMM	2100.00

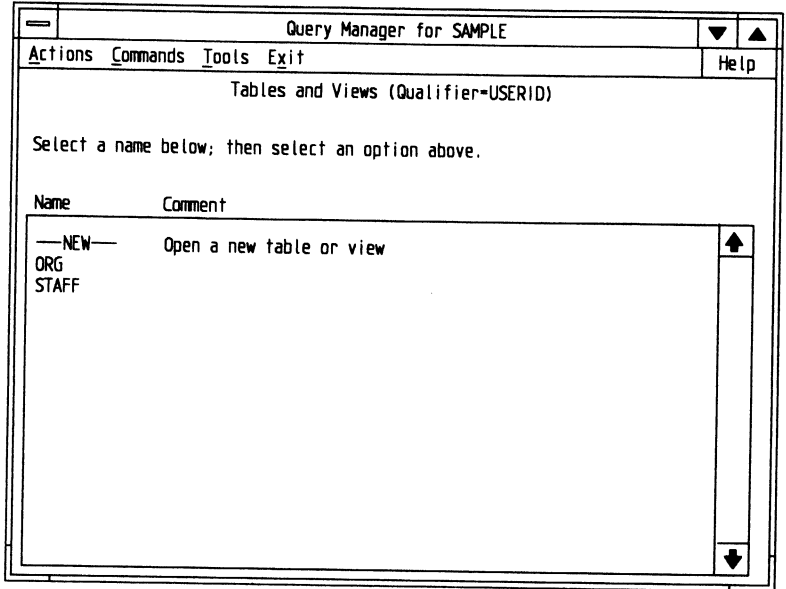
6. Type 370 as the value for the first column and then type the remaining values for each column as shown in the illustration.
7. Select **Actions** from the action bar and then select **Add and next** in the pull-down. Alternate method—Press the Add and Next (Ctrl + F2) keys.

The row is added to the table and the Add Data into STAFF panel is displayed again.

8. Select **Exit** from the action bar and then select **Exit Panel** in the pull-down. Alternate method—Press the Exit Panel (F3) key.

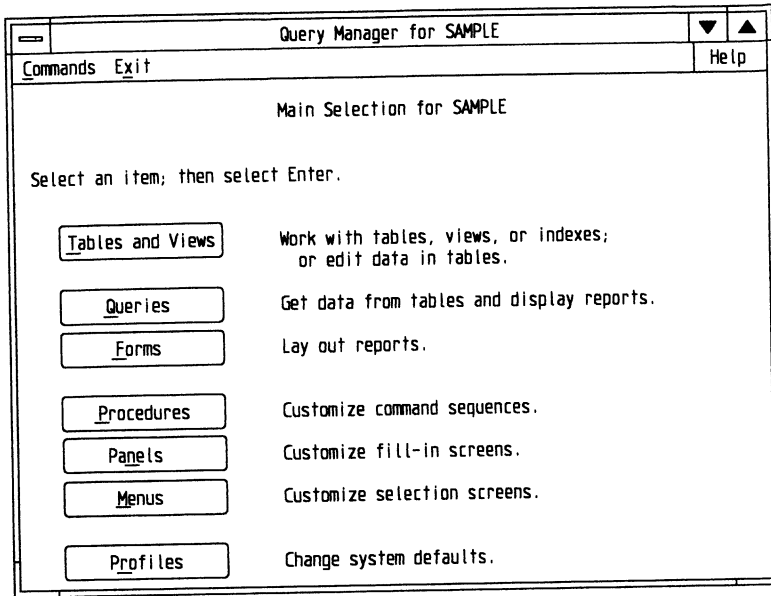
The data is automatically saved when the row is added to the table. Therefore, a Save panel is not displayed when you exit.

The Tables and Views primary menu is displayed.



9. Select **Exit** from the action bar and then select **Exit Tables and Views** in the pull-down. Alternate method—Press the Exit Tables and Views (F3) key.

The Main Selection for SAMPLE menu is displayed.



10. Continue to "Exercise 4 - Changing Data in a Table" on page 2-55, or press the Exit Query Manager (Shift + F3) key in the Main Selection menu to exit Query Manager and return to the Group - Main window.

Exercise 4 - Changing Data in a Table

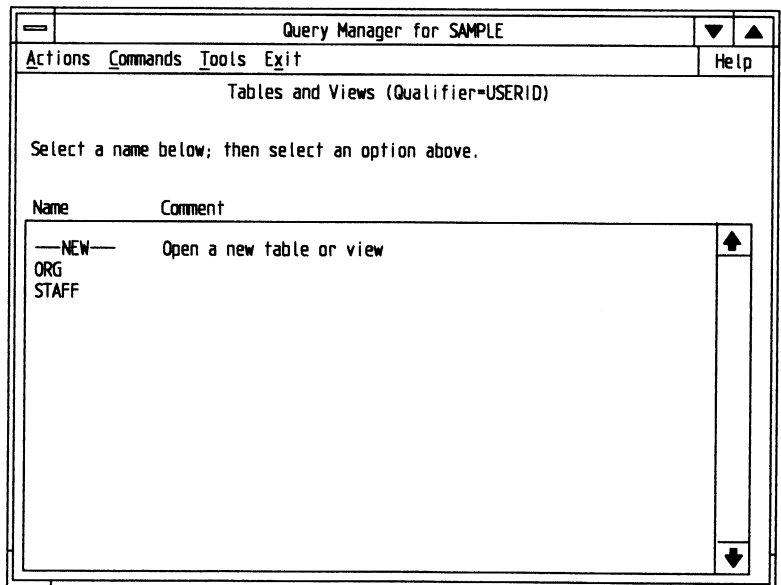
You can change or delete existing data in a table. For example, one of your employees may move to a different department. In the following exercise, you will change the department for Rothman to 29.

Similar to adding data to a table, you change data in a table by first selecting the table from the database it is located in. Next, use a search argument to retrieve the row or rows of data you want to change. Then type the changes on the panel, process the change, and continue to change another row of data based on the same search argument or a different search argument.

1. Select **Tables and Views** in the Main Selection menu.

Note: If necessary, see “Opening the Sample Database” on page 1-9 for steps to open the sample database and display the Main Selection for SAMPLE menu.

The Tables and Views primary menu is displayed.



2. Select **STAFF** in the Tables and Views primary menu as the table you want to change.

3. Select **Actions** from the action bar and then select **Change data rows** in the pull-down. Alternate method—Press the Change Data Rows (Ctrl+F1) key.

The Search for Data in STAFF panel is displayed.

Query Manager for SAMPLE

Actions Exit Help

Search for Data in STAFF

Complete by typing; then select from Actions above or press Ctrl+F6 to search for a row.

ID	-
NAME	Rothman
DEPT	-
JOB	-
YEARS	-
SALARY	-
COMM	-

4. Type Rothman (uppercase R, lowercase othman) for **NAME**, as shown in the illustration, to display the row that you want to change.

Note: You must type your search information in the same way that it was entered in the table you are searching on. For example, if the data was entered in all uppercase, then that is how you would enter your search data. In this exercise, the data was entered in the STAFF table in mixed case.

Ensure that you type this name in Replace mode.

5. Select **Actions** from the action bar and then select **Perform Search** in the pull-down. Alternate method—Press the Perform Search (Ctrl+F6) key.
6. Move the cursor to the **DEPT** entry field in the Change Data in STAFF panel and press the Erase to End of Field (Ctrl+Del) key to erase the current information.

7. Type 29 for **DEPT** as shown in the following illustration.

The screenshot shows a window titled "Query Manager for SAMPLE". The window has a menu bar with "Actions", "Exit", and "Help". Below the menu bar is a title bar "Change Data in STAFF". A message box says "Complete by typing; then select from Actions above or press Ctrl+F1 to change this row and display the next row." Below the message is a table with the following data:

ID	70
NAME	Rothman
DEPT	29
JOB	Sales
YEARS	7
SALARY	16502.83
COMM	1152.00

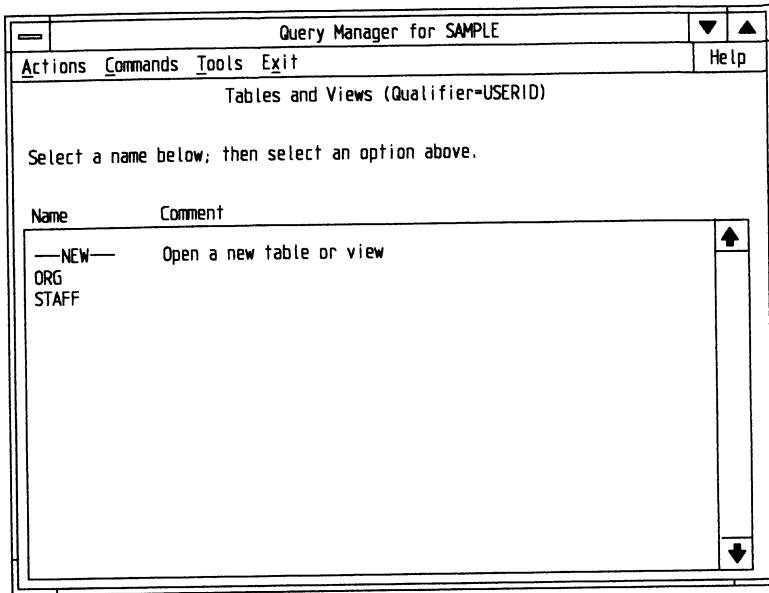
The DEPT field is highlighted with a white background. The table has a vertical scrollbar on the right and a horizontal scrollbar at the bottom.

8. Select **Actions** from the action bar and then select **Change and next** in the pull-down. Alternate method—Press the Change and Next (Ctrl+F1) key.

A message is displayed informing you that the change is made to the table. This message is automatically removed when you move the cursor to the next entry field.

9. Select **Exit** from the action bar and then select **Exit Panel** in the pull-down. Alternate method—Press the Exit Panel (F3) key.

The Tables and Views primary menu is displayed.



10. Select **Exit** from the action bar and then select **Exit Tables and Views** in the pull-down. Alternate method—Press the Exit Tables and Views (F3) key.

The Main Selection for SAMPLE menu is displayed.

11. Continue to "Exercise 5 - Defining a Table" on page 2-59, or press the Exit Query Manager (Shift + F3) key in the Main Selection for SAMPLE menu to exit Query Manager and return to the Group – Main window.

Exercise 5 - Defining a Table

At some time, you may need to add new information to a database. If the new information does not fit the structure of the tables currently in your database, you can define a new table for it.

For example, if you want to add information on managers' names, IDs, office locations, departments, and salaries to the database, you can define a new table just for management information. When you define a table, you specify the names of columns and the type of information that can be included in each column.

Specify the columns in a logical order so that adding or changing data is simplified. For instance, if you define a table that is used to store names and addresses of your managers, it is more logical to have the name column first, the street address column second, the city column third, and so forth. You also need to know the type of information you want to store in each column. For instance, a name column would contain character information, while a salary column would contain decimal information.

Note: When you are defining names for your tables and columns, you should refer to the appropriate appendix in the *User's Guide, Volume 3: Database Manager* to ensure that you do not type names that are not valid because they are reserved words or may become reserved words in future releases of Database Manager.

To Set Referential Constraints

Each table you create contains a particular type of data. The relationship between tables determines how data in tables can be updated. You should plan to define groups of tables that reference one another using a series of logical steps. To understand the purpose of these steps, you must first understand how to use data and referential constraints.

The following definitions are useful for understanding referential integrity:

- A *primary key* is a column or an ordered collection of columns containing non-null values that uniquely identify a row. A value is unique if it cannot be duplicated in any other row.

- A *foreign key* is a column or columns in a table whose values are required to match at least one primary key value of a row of its parent table. A foreign key is used to establish a relationship with a primary key for the purpose of enforcing referential integrity among tables.
- A *parent table* is the table containing the primary key that defines the relationship with a dependent table. A table can be a parent in an arbitrary number of relationships.
- A *parent row* is a row of a parent table whose primary key value matches a foreign key value in a dependent table. A row in a parent table is not necessarily a parent row.
- A *dependent table* is a table in a relationship containing one or more foreign keys that define the relationship. A dependent table can also be a parent table. A dependent table can be in an arbitrary number of relationships.

A table can be designated as a dependent table by defining a foreign key specified on a certain column, which can then be used to reference a parent table with a primary key.

When you specify a foreign key, you also need to specify *delete rules* for the parent table. These rules specify what is to happen to dependent rows in dependent tables when an attempt is made to delete data in a parent table. The delete rules that can be specified are:

- *Restrict deletes* prevents you from deleting a parent row of the parent table that has dependent rows. If the row is not a parent row, it can be deleted.
- *Cascade deletes* deletes related rows in a dependent table when you delete a row of the parent table.
- *Set to null* sets the corresponding values of the foreign key in any dependent rows to the null character when you delete a row of a parent table.

When defining tables that reference one another, you should define parent tables with primary keys first. Define dependent tables that contain foreign keys after you have completed the parent table definition.

For more information on referential constraints, referential integrity, parent tables, and dependent tables, see the *User's Guide, Volume 3: Database Manager*.

-) In this exercise, you will define a new table, called **MGRTABLE**, containing the columns **MGRID**, **MGRLEVEL**, and **MGRSCHOOL** and add it to the sample database. In addition, you will define a primary key and a foreign key, placing a referential constraint on the new table by comparing all the manager IDs being entered against the **ID** column in the **STAFF** table that already exists. You will also be protected from inadvertently deleting an ID from the **STAFF** table. The type of delete rule that is specified when the table is created can prevent these deletions.

The following illustration shows the column names and kinds of data the **MGRTABLE** will contain. You will not add the data shown in this table in this exercise.

MGRID	MGRLEVEL	MGRSCHOOL
10	1	Y
30	1	N
50	2	Y
100	1	Y
140	3	Y
160	2	Y
210	1	Y

MGRTABLE

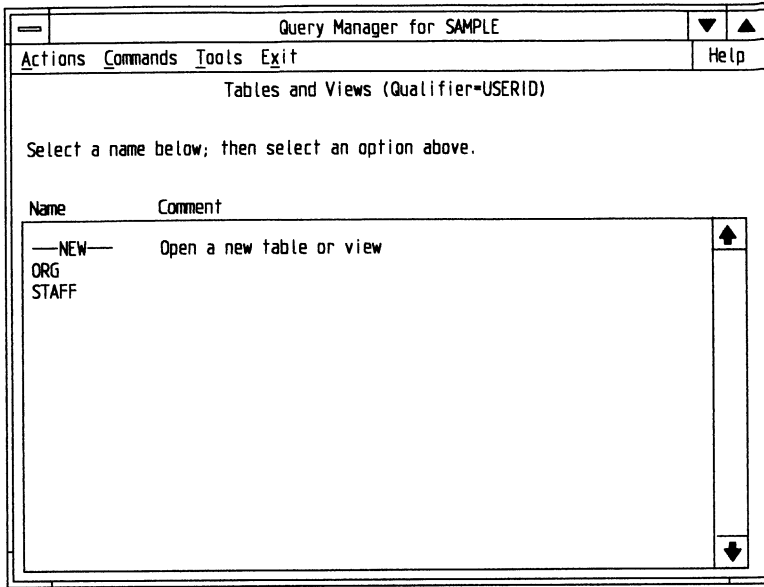
To Define a Table

For this exercise, you will add the new table to the sample database. You must open a **NEW** table to begin defining the columns for the table. After your table is defined, you can save it and provide a table name and optional comment.

1. Select **Tables and Views** in the Main Selection for **SAMPLE** menu.

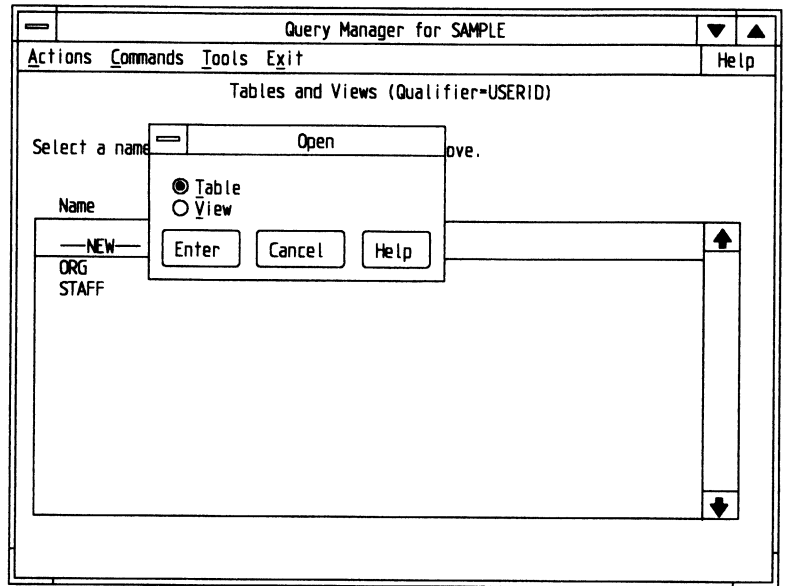
Note: If necessary, see "Opening the Sample Database" on page 1-9 for steps to open the sample database and display the Main Selection for **SAMPLE** menu.

The Tables and Views primary menu is displayed.



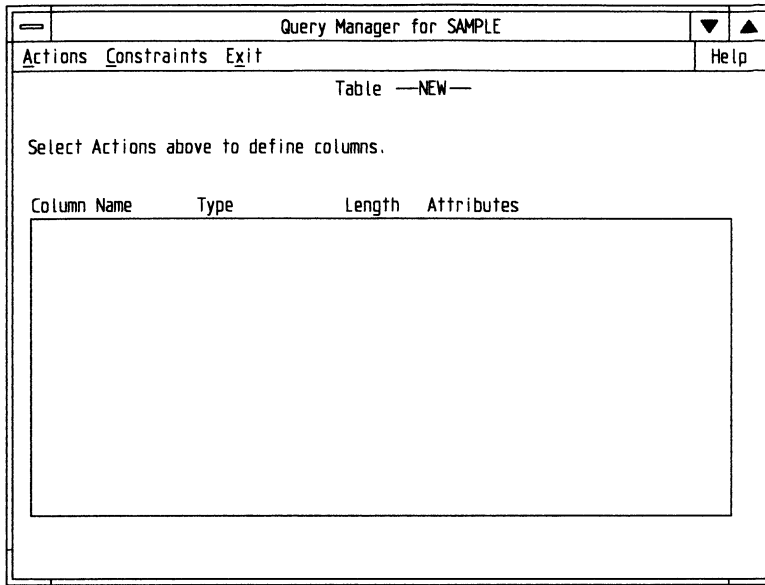
2. Select **—NEW—** in the Tables and Views primary menu.
3. Select **Actions** from the action bar and then select **Open definition** in the pull-down. Alternate method—Press the Open Definition (F6) key.

The Open menu is displayed.



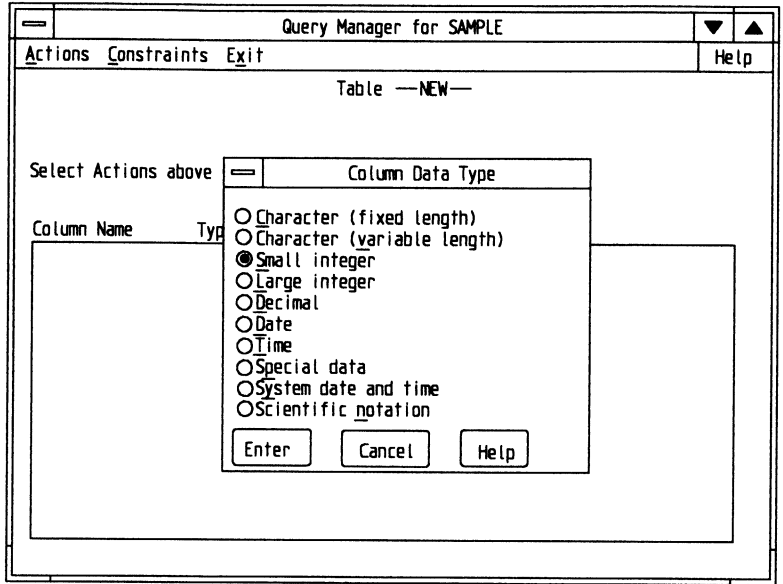
4. Select **Table** in the Open menu and then select Enter.

The Table panel is displayed. *Do not type in this panel.*



5. Select **Actions** from the action bar and then select **Add a column** in the pull-down. Alternate method—Press the Add a Column (Ctrl + F2) key.

The Column Data Type menu is displayed.



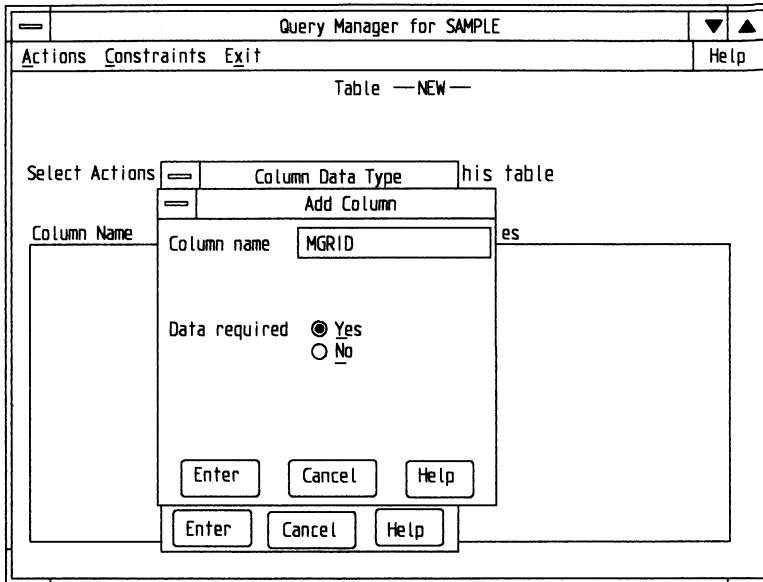
You are now ready to start defining the columns for the table.

The first new column contains all of the managers' IDs for your table. The first attribute you must define is the *column data type*. Since IDs are numeric information, the most suitable column data type is **Small integer**. For more information on choosing column data types, see the *User's Guide, Volume 3: Database Manager* or select Help.

6. Select **Small integer** and then select Enter.

The Add Column panel is displayed.

Note: To make selections from a menu or panel with multiple selections or entry fields in addition to menu items, use the cursor movement keys (↑, ↓) to move between selections and entry fields. Press the Tab key to move among the entry fields and use the ↑ and ↓ keys to select menu items; provide any necessary information for entry fields and then select Enter.



- 7. Type MGRID for **Column name**.
- 8. Select **Yes** for **Data required** and select Enter.

Notes:

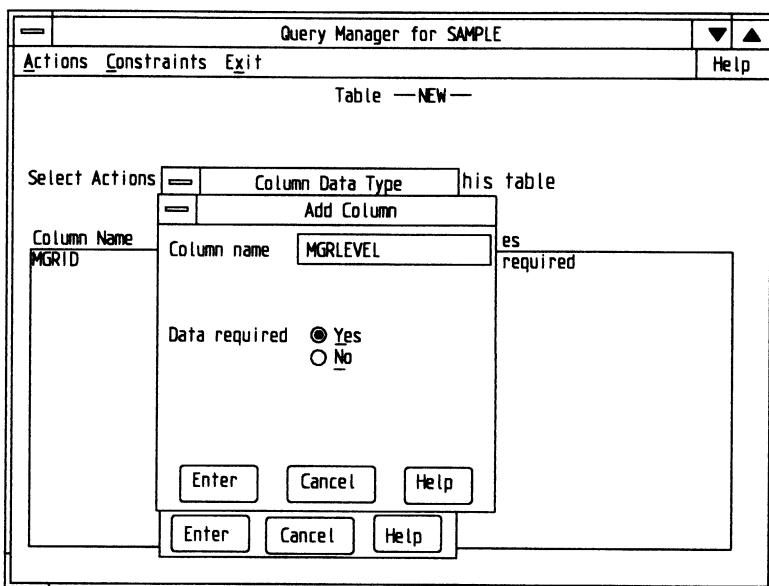
- a. The system defines the column length based on the type of column selected.
- b. **Data required** allows you to specify whether the column must contain data. For more information on setting **Data required**, see the *User's Guide, Volume 3: Database Manager*.
- c. The column you defined is displayed in the Table panel under the Column Data Type menu. As you define each column, it is added and displayed on the Table panel.

The Column Data Type menu is displayed again so that you can continue defining columns.

You will now define a second column, called **MGRLEVEL**, for manager levels.

9. Select **Small integer** in the Column Data Type menu and select Enter.

The Add Column panel is displayed.



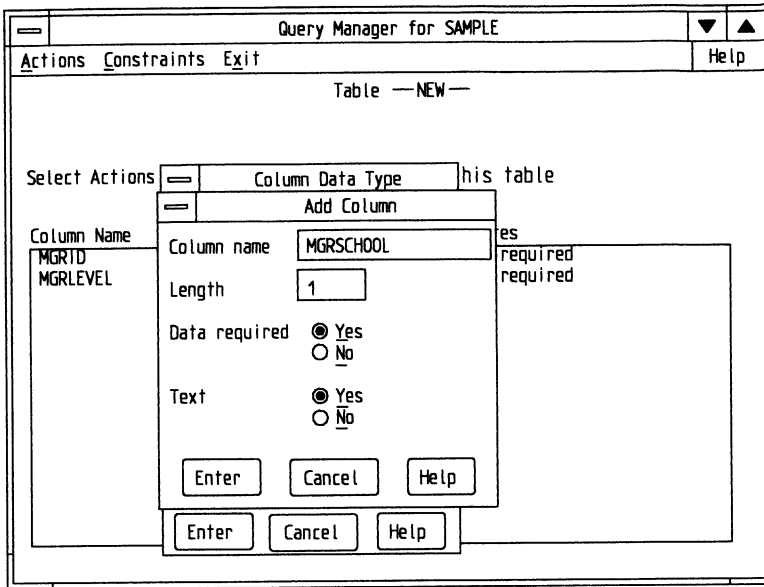
10. Type **MGRLEVEL** for **Column name**.
11. Select **Yes** for **Data required** and select Enter.

The Column Data Type menu is displayed again.

You will now define a third column called **MGRSCHOOL** to indicate whether a manager has attended manager school.

12. Select **Character (fixed length)** in the Column Data Type menu and select Enter.

The Add Column panel is displayed.



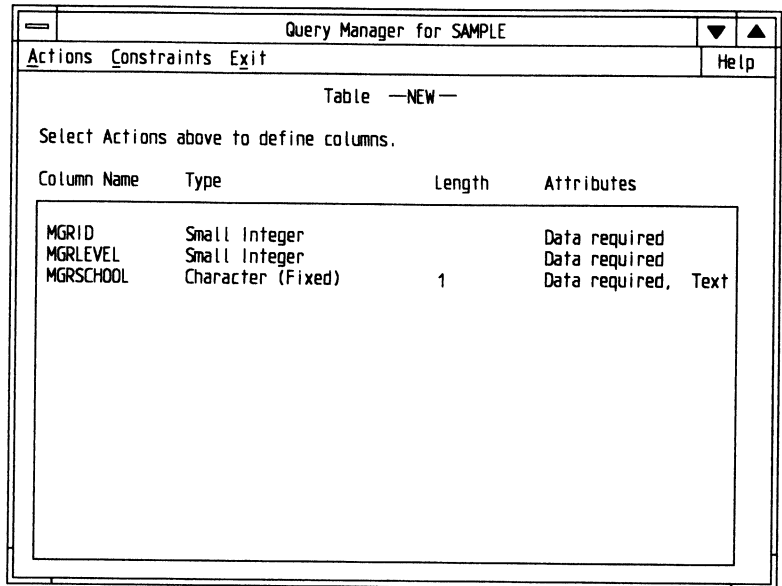
13. Type MGRSCHOOL for **Column name**; then type 1 for **Length** as shown in the illustration.
14. Select **Yes** for **Data required** and **Yes** for **Text** and then select **Enter**.

Note: **Text** allows you to specify whether the column is used for normal text or for binary data. A **Yes** indicates that the data should be translated from ASCII format when exchanging data with other non-ASCII based systems. For more information on setting **Text**, see the *User's Guide, Volume 3: Database Manager*.

The Column Data Type menu is displayed again.

15. Select **Cancel** in the Column Data Type menu to return to the Table panel.

The Table panel is displayed and should resemble the following illustration.



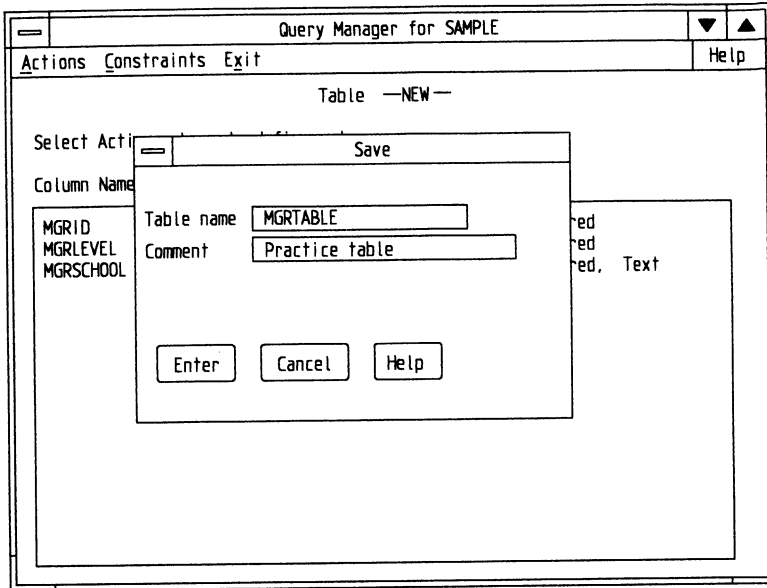
16. Select **Exit** from the action bar and then select **Exit Table** in the pull-down. Alternate method—Press the Exit Table (F3) key.

A confirmation panel is displayed.

17. Select **Save and exit** and select Enter.

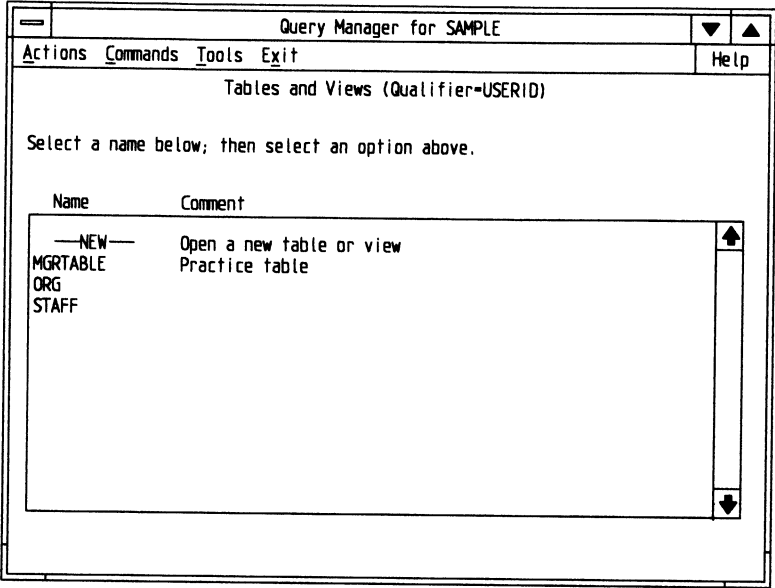
The Save panel is displayed.

- 18. Type MGRTABLE for **Table name**; then type Practice table for **Comment**.



- 19. Select Enter to save the table.

The Tables and Views primary menu is displayed.



Notice that MGRTABLE has been added to the Tables and Views primary menu.

To Define a Referential Constraint for MGRTABLE

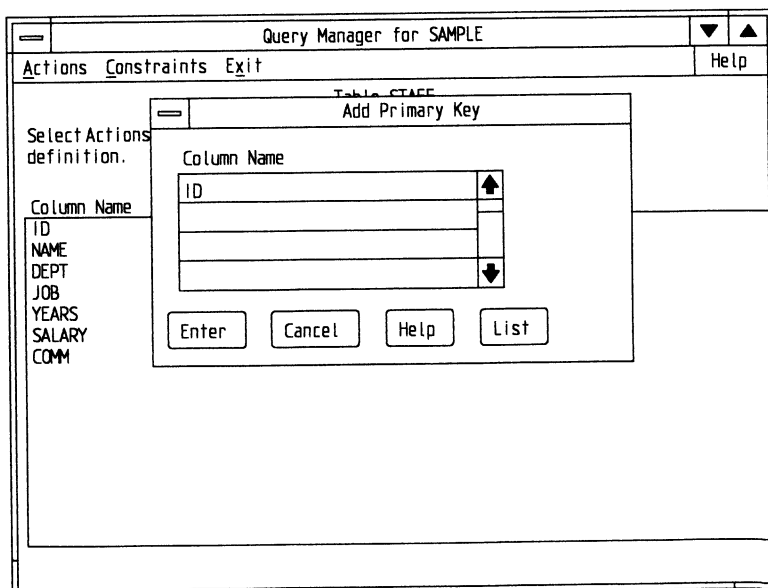
Now that you have defined your new table, you want to place a referential constraint on it so that incorrect manager IDs cannot be added to MGRTABLE (the dependent table). To do this, you must define the MGRID column in MGRTABLE as a foreign key. It must be compared to the ID column (primary key) in STAFF (the parent table). The following procedure shows you how to define the primary key and the foreign key for these tables.

1. Select **STAFF** in the Tables and Views primary menu.
2. Select **Actions** from the action bar and then select **Open definition** in the pull-down. Alternate method—Press the Open Definition (F6) key.

The Table STAFF panel is displayed.

3. Select **Constraints** from the action bar and then select **Add primary key** in the pull-down. Alternate method—Press the Add Primary Key (Ctrl + F5) key.

The Add Primary Key panel is displayed.



4. Type **ID** in the first entry field under **Column Name**, as shown in the previous illustration and select Enter.

The **ID** column is now the primary key in the **STAFF** table.

5. Select **Exit** from the action bar and then select **Exit Table** in the pull-down. Alternate method—Press the Exit Table (F3) key.

A confirmation panel is displayed.

6. Select **Save and exit** and select Enter.

The Save panel is displayed.

7. Type **PRIMARY KEY/ID** for **Comment** in the Save panel and then select Enter.

The Tables and Views primary menu is displayed.

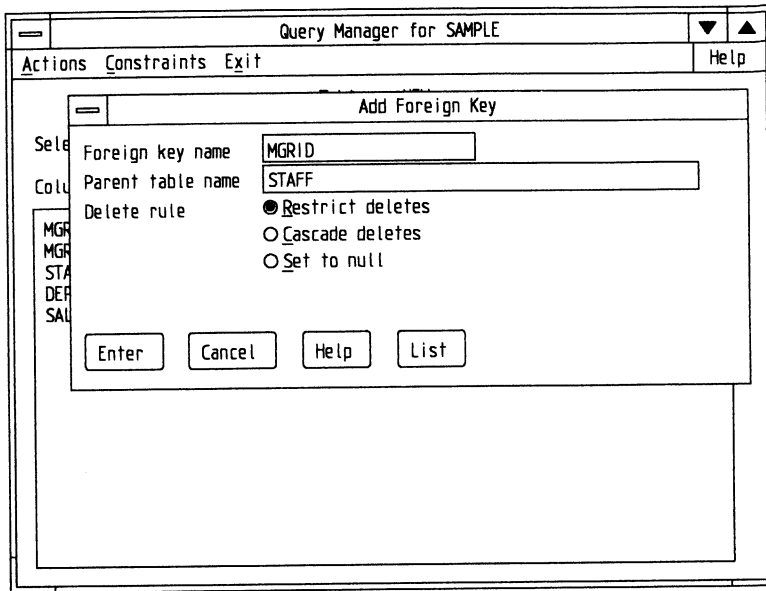
Now you will define a foreign key for **MGRTABLE** that will be verified against the primary key **ID** in the **STAFF** table.

8. Select **MGRTABLE** in the Tables and Views primary menu.
9. Select **Actions** from the action bar and then select **Open Definition** in the pull-down. Alternate method—Press the Open Definition (F6) key.

The Table **MGRTABLE** panel is displayed.

10. Select **Constraints** from the action bar and then select **Add foreign key** in the pull-down. Alternate method—Press the Add Foreign Key (Ctrl + F6) key.

The Add Foreign Key panel is displayed.

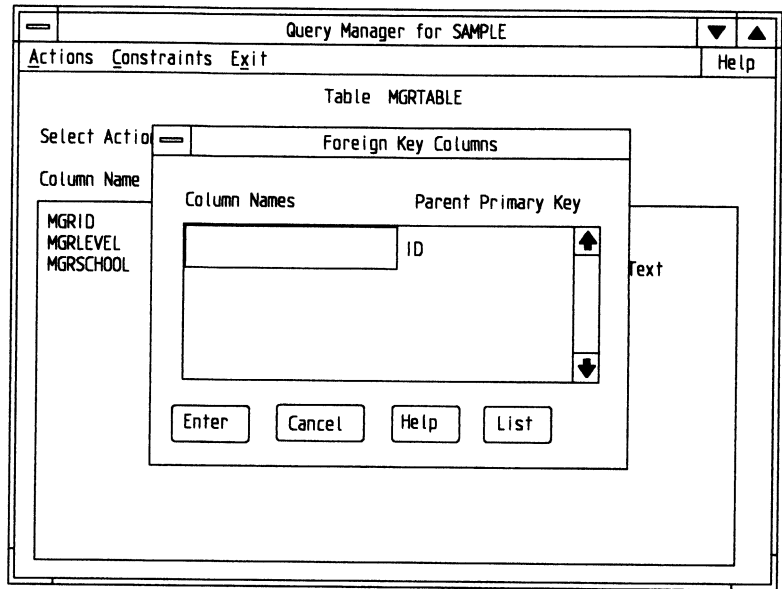


11. Type **MGRID** for **Foreign key name** and **STAFF** for **Parent table name**.
12. Select **Restrict deletes** for **Delete rule** and select Enter.

For information on the delete rules (Restrict deletes, Cascade deletes, and Set to null), see the *User's Guide, Volume 3: Database Manager*.

Note: When someone violates a constraint, an error message is displayed. The foreign key name is the name that displays in error messages warning you when an entry to **MGRTABLE** is not valid.

The Foreign Key Columns panel is displayed with ID listed as the parent primary key.



13. Type MGRID for **Column Names** and select Enter.

The MGRID column is now the foreign key in the MGRTABLE table.

The Table MGRTABLE panel is displayed. You have completed the task of defining the referential constraints for the STAFF and MGRTABLE tables.

14. Select **Exit** from the action bar and then select **Exit Table** in the pull-down. Alternate method—Press the Exit Table (F3) key.
15. Select **Save and exit** and select Enter.

The Save panel is displayed.

16. Type FOREIGN KEY/MGRID (to replace **Practice table**) for **Comment** and then select Enter.

The Tables and Views primary menu is displayed.

In the following steps, you will add data to the MGRTABLE table and then try to delete a row of data from the STAFF table to see how referential integrity is used.

17. Select **MGRTABLE** in the Tables and Views primary menu as the table you want to add data into.
18. Select **Actions** from the action bar and then select **Add data rows** from the Actions pull-down. Alternate method—Press the Add Data Rows (Ctrl+F2) key.

The Add Data into MGRTABLE panel is displayed.

Query Manager for SAMPLE

Actions Exit Help

Add Data into MGRTABLE

Complete by typing; then select from Actions above or press Ctrl+F2 to add this row and display a blank row.

MGRID	10
MGRLEVEL	1
MGRSCHOOL	Y

19. Type 10 for **MGRID**.

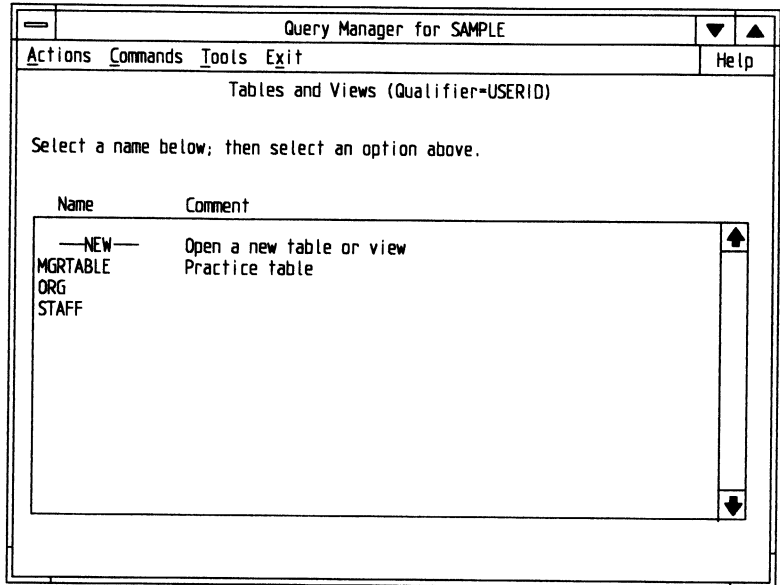
Note: Ensure that you are in Replace mode so that the data you type replaces the existing null character.
20. Type 1 for **MGRLEVEL**.
21. Type Y for **MGRSCHOOL**.
22. Select **Actions** from the action bar and then select **Add and next** in the pull-down. Alternate method—Press the Add and Next (Ctrl+F2) key.

A message is displayed informing you that the record is added to the table. This message is removed when you move the cursor to the next entry field.

The Add Data into MGRTABLE panel is displayed again.

23. Select **Exit** from the action bar and then select **Exit Panel** in the pull-down. Alternate method—Press the Exit Panel (F3) key.

The Tables and Views primary menu is displayed.



When you create a data row in a dependent table, in this case **MGRTABLE**, a corresponding data row is referenced in the parent table. The foreign key (**MGRID**) on **MGRTABLE** will cross-reference to the primary key (**ID**) on **STAFF** to determine if there is matching data. Since there is a match, referential integrity will be maintained by not allowing you to add a row of data with a **MGRID** that does not correspond to an **ID** in the **STAFF** table or by not allowing you to delete a row of data from the parent table that has a corresponding row in the **MGRTABLE**.

In the following steps, you will attempt to delete the primary key row **ID = 10** from the **STAFF** table (the parent table) which corresponds to the foreign key row **MGRID = 10** in the **MGRTABLE** (the dependent table). Because of referential constraints you defined earlier, you will not be allowed to delete the row.

24. Select **STAFF** in the Tables and Views primary menu.

25. Select **Actions** from the action bar and then select **Change data rows** in the pull-down. Alternate method—Press the Change Data Rows (Ctrl+F1) key.

The Search for Data in STAFF panel is displayed.

Query Manager for SAMPLE

Actions Exit Help

Search for Data in STAFF

Complete by typing; then select from Actions above or press Ctrl+F6 to search for a row.

ID	10
NAME	-
DEPT	-
JOB	-
YEARS	-
SALARY	-
COMM	-

26. Type 10 for **ID**.
27. Select **Actions** from the action bar and then select **Perform search** in the pull-down. Alternate method—Press the Perform Search (Ctrl+F6) key.

f

The Change Data in STAFF panel is displayed with the data row for the ID that you selected.

Query Manager for SAMPLE

Actions Exit Help

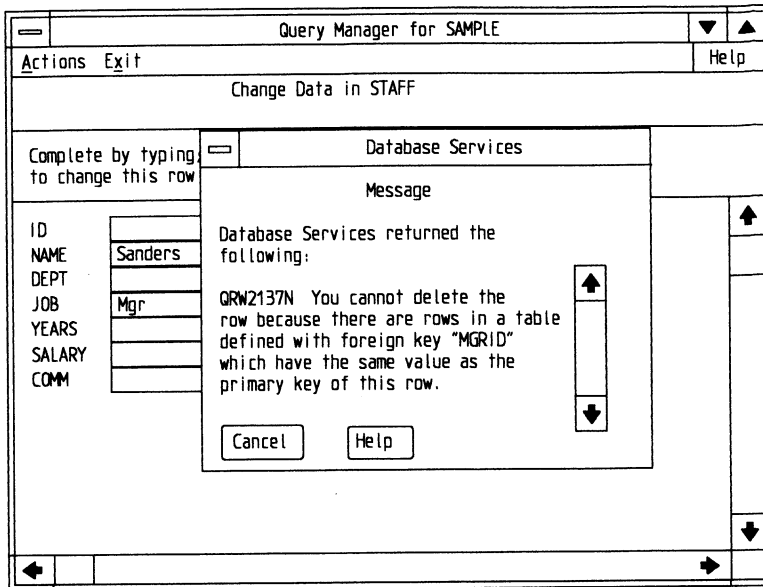
Change Data in STAFF

Complete by typing; then select from Actions above or press Ctrl+F1 to change this row and display the next row.

ID	10
NAME	Sanders
DEPT	20
JOB	Mgr
YEARS	7
SALARY	18357.20
COMM	-

28. Select **Actions** from the action bar and then select **Delete and Next** in the pull-down. Alternate method—Press the Delete and Next (Ctrl + F9) key.

A Message panel is displayed.



This error occurred because you have a dependent table that has a constraint on this parent row and **Restrict deletes** was selected for **Delete rule**.

You placed a constraint on this field by identifying it as a foreign key field in the table named **MGRTABLE**. Since the constraint is **Restrict deletes**, you are not allowed to delete this data row from the parent table. With referential integrity, you can put controls in place to prevent data from being deleted unintentionally.

To delete this parent row, you need to delete the dependent row in the **MGRTABLE** first and then delete this row in the **STAFF** table.

Note: If you had specified the foreign key in **MGRTABLE** with the cascade rule, the dependent row in **MGRTABLE** would have been automatically deleted when the parent row was deleted.

29. Select **Cancel** to remove the message.
30. Select **Exit** from the action bar and then select **Exit Panel** in the pull-down. Alternate method—Press the **Exit Panel (F3)** key.

The **Tables and Views** primary menu is displayed.

31. Select **Exit** from the action bar and then select **Exit Query Manager** in the pull-down. Alternate method—Press the **Exit Query Manager (Shift + F3)** key.
 -) A confirmation panel is displayed.
32. Select **Yes** to exit Query Manager.

The **Group-Main** window is displayed.

Chapter 3. After You Complete the Exercises

You have completed exercises that demonstrate some tasks you can perform with Query Manager. In doing the exercises, you have changed the sample database provided with Query Manager.

At this time, you can erase the sample database to free up disk space. If you want to reinstall the sample database again at a later time, refer to “Installing the Sample Database and Starting Query Manager” on page 1-7.

To Erase the Sample Database

To erase the sample database, use the following steps:

1. Select **SAMPLE** on the Databases primary menu.
2. Select **Actions** from the action bar and then select **Erase** in the pull-down. Alternate method—Press the Erase (Shift + F8) key.
3. Select **Yes** in the confirmation panel.

The Databases primary menu is displayed and **SAMPLE** is removed.

4. Select **Exit** from the action bar and then select **Exit Query Manager** in the pull-down. Alternate method—Press the Exit Query Manager (Shift + F3) key.

A confirmation panel is displayed.

5. Select **Yes** to exit Query Manager.

The Group-Main window is displayed.

To Erase Tables from the Sample Database

If your workstation is a Database Requester, your database manager system administrator may have instructed you to erase the tables you used in the exercises.

To erase a table from the sample database, use the following steps:

1. Select the table that you want to erase in the Tables and Views primary menu.
2. Select **Actions** from the action bar and then select **Erase** in the pull-down. Alternate method—Press the Erase (Shift + F8) key.
3. Select **Yes** in the confirmation panel.

The Tables and Views primary menu is displayed and the selected table is removed.

4. Continue with the previous steps until all the tables are erased from the sample database.
5. Select **Exit** from the action bar and then select **Exit Query Manager** in the pull-down. Alternate method—Press the Exit Query Manager (Shift + F3) key.

A confirmation panel is displayed.

6. Select **Yes** to exit Query Manager.

The Group-Main window is displayed.

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