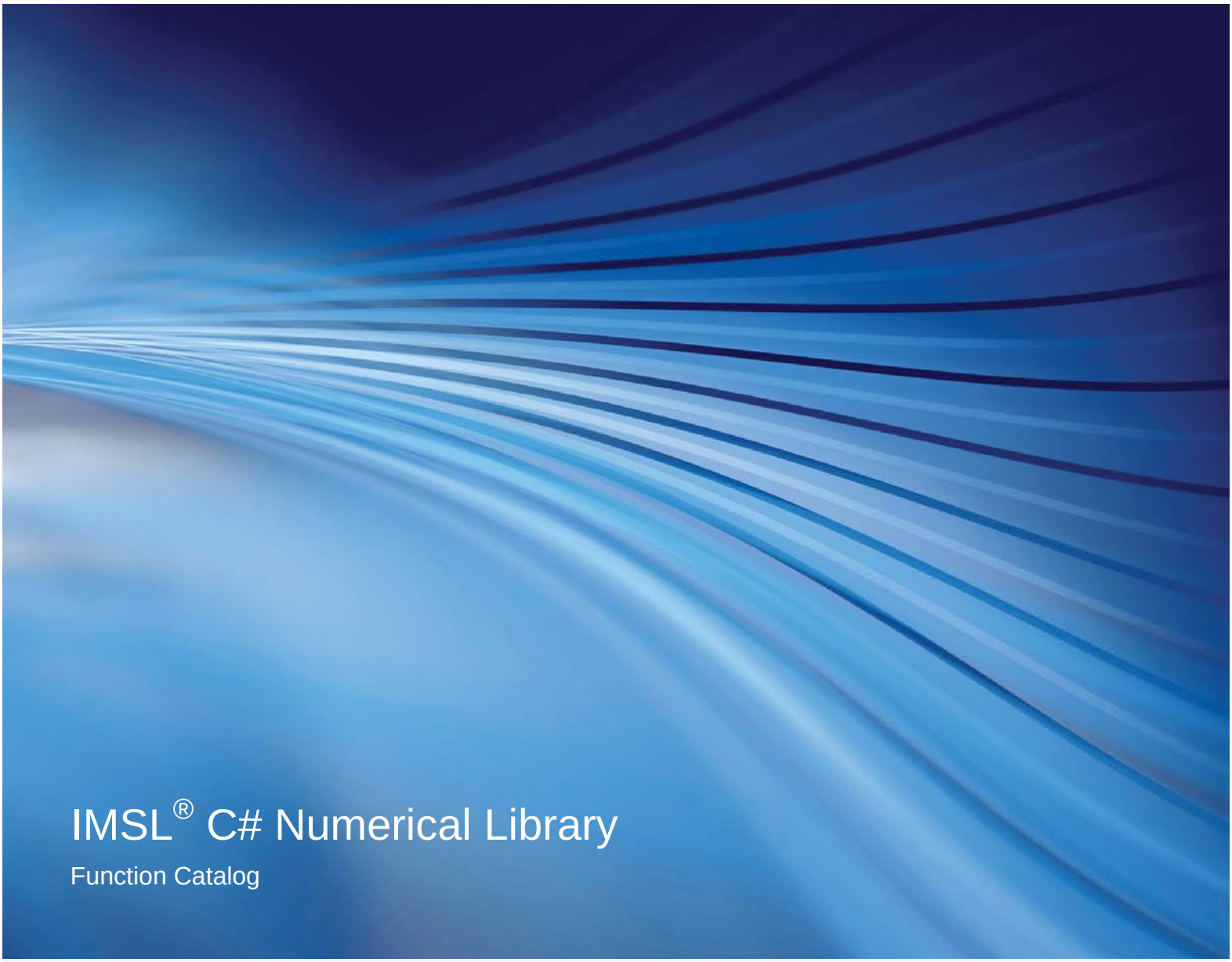

IMSL® C# Numerical Library

Function Catalog

Version 6.5

ROGUE WAVE SOFTWARE

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IMSL Libraries Contact Information
Contact Support

Products Overview
Products Overview

IMSL® C, C#, Java™ and Fortran Application Development Tools

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IMSL® C# NUMERICAL LIBRARY

Written for .NET programmers for use on the .NET Framework, based on the world's most widely called numerical algorithms.

The IMSL C# Library is a 100% C# analytical library, providing broad coverage of advanced mathematics and statistics for the Microsoft® .NET Framework. The IMSL C# Library is documented and tested managed code for full compatibility with the .NET Framework.

IMSL NUMERICAL LIBRARIES

The IMSL Numerical Libraries, including the IMSL C# Library, offer an extensive and comprehensive package of trusted IMSL mathematical and statistical numerical algorithms.

These libraries free developers from having to build their own internal code by providing pre-written mathematical and statistical algorithms that can be embedded into C, C++, .NET, Java™, Fortran, and Python applications.

CONVENIENCE AND OPEN STANDARDS

Using the IMSL C# Library, developers can build applications on the .NET Framework that provide more powerful business analytics than ever before. The IMSL C# Library delivers a new level of embeddable and scalable analytics capability to Visual Studio® users that was once only found in traditional high-performance computing environments.

The advanced mathematical, statistical, and finance algorithms found in the IMSL C# Library are written in 100% C#. This offers .NET developers seamless accessibility to advanced analytics capabilities in the most integrated language for the .NET environment with the highest degree of programming productivity and ease of use with Visual Studio. IMSL C# Library charting classes work within the .NET environment to provide flexibly and extensible 2D graphics to any application.

Rogue Wave has taken C# to a new level by extending the mathematical framework of the language, significantly increasing the high performance analytics capabilities available for the .NET Framework. The algorithms in the IMSL C# Library are extremely accurate, as they are based on over four decades of IMSL' technical computing experience with the IMSL Libraries.

HIGH PERFORMANCE WHEN PERFORMANCE MATTERS

With .NET 4.0 and Visual Studio 2010, Microsoft has extended the threading capabilities of the .NET Framework with the Task Parallel Library. Starting with version 6.5, the IMSL C# Library has integrated these threading patterns into dozens of functions to enhance performance by taking advantage of multi-core hardware. The programming interfaces to IMSL classes remain the same, and so developers do not need to worry about the details of the parallelization work.

Many users require a pure C# assembly, while others require just a C# interface and demand the highest performance under the hood. The IMSL C# Library comes in two versions to address both scenarios. The first is a pure C# implementation that provides 100% managed code. Starting with version 5.0, a second version integrates the Intel® Math Kernel Library into the IMSL C# Library providing high performance for applications that do not require a pure C# assembly. Both versions adhere to the same API, but users now have the option of using the optimized C++ Math Kernel Library for many linear algebra functions.

MOST ADVANCED NUMERICAL ANALYSIS LIBRARY FOR MICROSOFT .NET APPLICATIONS

.NET languages naturally make programming easier and faster. The IMSL C# Library is written in pure C# and ensures that programs written today will stay in compliance and remain compatible with future applications. Managed code provides interoperability and deployment flexibility for .NET-connected applications.

A developer can write an application in C#, VB.NET, IronPython, F# and other .NET compatible languages and seamlessly use the IMSL C# Library as the analysis engine without the need to wrap in unmanaged code.

DESKTOP AND WEB ENVIRONMENTS

The IMSL C# Library supports both traditional desktop environments and web environments. Charting classes are supported in Windows.Forms desktop applications and ASP.NET web applications while the mathematical and statistical algorithms are supported in Console, Windows, and Silverlight applications. A separate assembly built for the Silverlight 3.0 environment is included as part of the product starting with version 6.5. Desktop support is also extensible to the Microsoft Office product suite using the Visual Studio Tools for Office (VSTO).

ERROR HANDLING

Diagnostic error messages are clear and informative – designed not only to convey the error condition, but also to suggest corrective action if appropriate. These error-handling features:

- Allow faster and easier program debugging
- Provide more productive programming and confidence that the algorithms are functioning properly

COST-EFFECTIVE

The IMSL C# Library significantly shortens program development time and promotes standardization. Using the IMSL C# Library saves time in source code development and the design, development, documentation, testing and maintenance of applications.

FULLY-TESTED

IMSL has over four decades of experience in testing IMSL numerical algorithms for quality and performance across an extensive range of the latest compilers and environments. This experience has allowed Rogue Wave to refine its test methods to a great level of detail. The result of this effort is a robust, sophisticated suite of test methods that allows the IMSL user to rely on the numerical analysis functionality and focus their bandwidth on application development and testing.

COMPREHENSIVE DOCUMENTATION

Documentation for the IMSL C# Library is comprehensive, clearly written and standardized. Detailed information about each class consists of the name, purpose, synopsis, exceptions, return values and usage examples.

UNMATCHED PRODUCT SUPPORT

Behind every Rogue Wave license is a team of professionals ready to provide expert answers to questions about the IMSL Numerical Libraries.

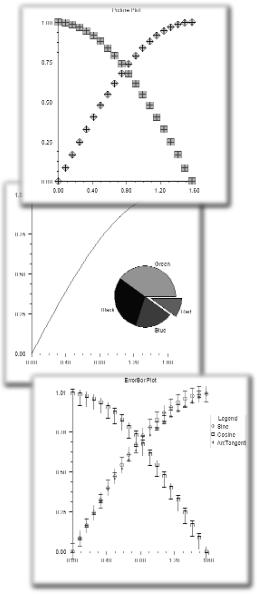
Product support:

- Gives users direct access to Rogue Wave' resident staff of expert product support specialists
- Provides prompt, two-way communication
- Includes product maintenance updates

CONSULTING SERVICES

Rogue Wave offers expert consulting services for algorithm development as well as complete application development. Please contact Rogue Wave to learn more about its extensive experience in developing custom algorithms, building algorithms in scalable platforms, and full applications development.

Functionality Overview



CHARTING FUNCTIONALITY

- Scatter
- Line
- High-Low-Close
- Candlestick
- Pie
- Bar
- Histogram
- Shewhart Control Charts
- Log and Semilog
- Polar
- Area
- Function and Spline
- Error Bar
- Date/Time Support
- Contour Plot
- Box Plot
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- Tree Map
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MATHEMATICS, STATISTICS, DATA MINING, AND FINANCE FUNCTIONALITY

- Basic Types
- Linear Algebra
- Eigensystems
- Interpolation and Approximation
- Quadrature
- Differential Equations
- Transforms
- Nonlinear Equations
- Optimization
- Special Functions
- Basic Statistics
- Nonparametric Tests
- Regression
- Variances, Covariances, and Correlations
- Analysis of Variance
- Time Series and Forecasting
- Survival and Reliability Analysis
- Goodness of Fit
- Distribution Functions
- Random Number Generation
- Data Mining
- Neural Networks
- Finance and Bond Calculations

IMSL® Libraries are also available for C, Java, Fortran and Python

IMSL C Numerical Library

The IMSL C Numerical Library delivers advanced mathematical and statistical functionality for programmers to embed in C/C++ applications. This comprehensive set of functions is based upon the same algorithms contained in the highly regarded IMSL Fortran Library. The IMSL C Library is available on a wide range of development platforms and offers functions in key areas such as optimization, data mining, forecasting and design of experiments analysis. These pre-tested functions result in superior performance, increased scalability, ease of integration and greater reliability for software applications that require advanced mathematics and statistics. Dozens of algorithms take advantage of multi-core hardware using standard OpenMP directives.

JMSL™ Numerical Library for Java Applications

The JMSL Numerical Library for Java applications is the broadest collection of mathematical, statistical, financial, data mining and charting classes available in 100% Java. It is the only Java programming solution that combines integrated charting with the reliable mathematical and statistical functionality of the industry-leading IMSL Numerical Library algorithms. This blend of advanced numerical analysis and visualization on the Java platform allows organizations to gain insight into valuable data and share analysis results across the enterprise quickly. The JMSL Library continues to be the leader, providing robust data analysis and visualization technology for the Java platform and a fast, scalable framework for tailored analytical applications..

IMSL Fortran Numerical Library

The IMSL Fortran Numerical Library is the gold standard mathematical and statistical code library for Fortran programmers developing high performance computing applications. The IMSL Fortran Library contains highly accurate and reliable Fortran algorithms with full coverage of mathematics and statistics and complete backward compatibility. The IMSL Fortran Library is a comprehensive library of mathematical and statistical algorithms available in one cohesive package. It combines the powerful and flexible interface features of the Fortran language with the performance benefits of both distributed memory and shared memory multiprocessing architectures.

PyIMSL™ Studio

PyIMSL Studio is the only commercially-available numerical analysis application development environment designed for deploying mathematical and statistical prototype models into production applications. PyIMSL Studio closes the prototype to production gap by providing modelers and implementation teams with a common set of tested and supported high-quality development tools as well as the same underlying numerical algorithms. Using PyIMSL Studio, prototype work is transformed into production applications faster, with less complexity, cost and risk to the project.

Imsl Namespace

Imsl

Imsl namespace contains basic informational and error handling classes.

BASIC TYPES

CLASS	DESCRIPTION
IMSLException	Signals that a mathematical exception has occurred.
IMSLUnexpectedErrorException	Signals that an unexpected error has occurred.
Logger	Implements logging in some IMSL algorithms.
Warning	Handles warning messages.
WarningObject	Handles warning messages. This class maintains a single, private, WarningObject that actually displays the warning messages.

Imsl.Math Namespace

Imsl.Math

Imsl.Math namespace contains a wide range of mathematical classes, beginning with basic data types such as complex numbers and matrices and progressing to advanced numerical analysis.

BASIC TYPES

CLASS	DESCRIPTION
Complex	Implements complex numbers, providing the basic operations (addition, subtraction, multiplication, division) as well as a set of complex functions.
Matrix	Matrix manipulation functions.
ComplexMatrix	Complex matrix manipulation functions.
SparseMatrix	Data structures and manipulation functions for sparse matrices.
ComplexSparseMatrix	Data structures and manipulation functions for complex sparse matrices.

LINEAR ALGEBRA

CLASS	DESCRIPTION
LU	Solves a real general system of linear equations $Ax = b$. Includes methods for inverse, determinant and condition number.
SuperLU	Computes the LU factorization of a general sparse matrix of type SparseMatrix by a column method and solves a real sparse linear system of equations $Ax = b$.
ComplexLU	Solves a complex general system of linear equations $Ax = b$. Includes methods for inverse, determinant and condition number.
ComplexSuperLU	Computes the LU factorization of a general sparse matrix of type ComplexSparseMatrix by a column method and solves a complex sparse linear system of linear equations $Ax = b$.
Cholesky	Solves a real symmetric positive definite system of linear equations $Ax = b$.
SparseCholesky	Computes the Cholesky factorization of a matrix of type SparseMatrix.
ComplexSparseCholesky	Computes the Cholesky factorization of a matrix of type ComplexSparseMatrix.
QR	Computes the QR decomposition of a matrix using Householder transformations.
SVD	Computes the singular value decomposition of a real rectangular matrix A.
GenMinRes	Linear system solver using the restarted generalized minimum residual (GMRES) method.
ConjugateGradient	Solves a real symmetric definite linear system using the conjugate gradient method with optional preconditioning.

EIGENSYSTEMS

CLASS	DESCRIPTION
Eigen	Computes the eigen expansion of a real matrix *A*.
SymEigen	Computes the eigen expansion of real symmetric matrix *A*.

INTERPOLATION AND APPROXIMATION

CLASS	DESCRIPTION
Spline	A collection of spline functions. Includes methods to evaluate, integrate and compute derivatives of splines.
CsAkima	Extension of the Spline class to compute an Akima cubic spline interpolant.
CsInterpolate	Extension of the Spline class to compute a cubic spline interpolant with specified derivative endpoint conditions.
CsPerodic	Extension of the Spline class to compute a cubic spline interpolant with periodic boundary conditions.
CsShape	Extension of the Spline class to compute a cubic spline interpolant consistent with the concavity of the data.
CsSmooth	Extension of the Spline class to construct a smooth cubic spline to noisy data.
CsSmoothC2	Extension of the Spline class to construct a smooth cubic spline to noisy data using cross-validation to estimate the smoothing parameter.
CsTCB	Extension of the Spline class to handle a tension-continuity-bias (TCB) cubic spline, also known as a Kochanek-Bartels spline and is a generalization of the Catmull-Rom spline.
BSpline	A collection of B-Spline functions, including methods to evaluate, integrate, and compute derivatives of B-Splines, plus conversion of B-Splines to piecewise polynomials for charting.
BsInterpolate	Extension of the BSpline class to interpolate data points.
BsLeastSquares	Extension of the BSpline class to compute a least squares B-spline approximation to data points.
RadialBasis	Computes a least-squares fit to scattered data over multiple dimensions.
Spline2D	Represents and evaluates tensor-product splines.
Spline2DLeastSquares	Computes a two-dimensional, tensor-product spline approximant using least squares.
Spline2DInterpolate	Computes a two-dimensional, tensor-product spline interpolant from two-dimensional, tensor-product data.

QUADRATURE

CLASS	DESCRIPTION
Quadrature	A general-purpose integrator that uses a globally adaptive scheme to reduce the absolute error.
HyperRectangleQuadrature	Integrates a function on a hyper-rectangle using a quasi-Monte-Carlo method.

DIFFERENTIAL EQUATIONS

CLASS	DESCRIPTION
FeynmanKac	Solves the generalized Feynman-Kac PDE.
OdeAdamsGear	Extension of the ODE class to solve a stiff initial-value problem for ordinary differential equations using the Adams-Gear methods.
OdeRungeKutta	Solves an initial-value problem for ordinary differential equations using the Runge-Kutta-Verner fifth-order and sixth-order methods.
ODE	ODE represents and solves an initial-value problem for ordinary differential equations.

TRANSFORMS

CLASS	DESCRIPTION
FFT	Discrete Fourier transform of a real sequence.
ComplexFFT	Discrete Fourier transform of a complex sequence.

NONLINEAR EQUATIONS

CLASS	DESCRIPTION
ZeroPolynomial	Finds the zeros of a polynomial with complex coefficients using Aberth's method.
ZerosFunction	Finds the real zeros of a real, continuous, univariate function, $f(x)$.
ZeroSystem	Solves a system of n nonlinear equations $f(x) = 0$ using a modified Powell hybrid algorithm.

OPTIMIZATION

CLASS	DESCRIPTION
BoundedLeastSquares	Solves a nonlinear least-squares problem subject to bounds on the variables using a modified Levenberg-Marquardt algorithm.
BoundedVariableLeastSquares	Solves a linear least-squares problem with bounds on the variables.

OPTIMIZATION

CLASS	DESCRIPTION
DenseLP	Solves a linear programming problem using an active set strategy.
MinConGenLin	Minimizes a general objective function subject to linear equality/inequality constraints.
MinConNLP	Solves a general nonlinear programming problem using a sequential equality constrained quadratic programming method.
MinUnconMultiVar	Minimizes a function $f(x)$ of n variables using a quasi-Newton method.
MinUncon	Finds the minimum point of a smooth function $f(x)$ of a single variable.
NonlinLeastSquares	Solves a nonlinear least-squares problem using a modified Levenberg-Marquardt algorithm.
NonNegativeLeastSquares	Solves a linear least squares problem with non-negative constraints.
NumericalDerivatives	Computes the Jacobian matrix for a function $f(y)$ with m components in n independent variables.
QuadraticProgramming	Solves a quadratic programming problem subject to linear equality or inequality constraints.
MPSReader	Reads a linear programming problem from an MPS file.

SPECIAL FUNCTIONS

CLASS	DESCRIPTION
Bessel	Collection of Bessel functions.
Sfun	Collection of special functions including beta, gamma and others.

MISCELLANEOUS

CLASS	DESCRIPTION
Physical	Returns the value of various mathematical and physical constants.
EpisilonAlgorithm	Determines the limit of a sequence of approximations by means of the Epsilon algorithm.

PRINTING

CLASS	DESCRIPTION
PrintMatrix	Matrix printing utilities.
PrintMatrixFormat	Customizes the actions of PrintMatrix.

Imsl.Stat Namespace

Imsl.Stat

Imsl.Stat namespace contains a wide range of statistical classes, including summary statistics, regression, and ANOVA.

BASIC STATISTICS

CLASS	DESCRIPTION
Summary	Computes basic univariate statistics.
NormOneSample	Computes statistics for mean and variance inferences using a sample from a normal population.
NormTwoSample	Computes statistics for mean and variance inferences using samples from two normal populations.
TableOneWay	Tallies observations into a one-way frequency table.
TableTwoWay	Tallies observations into a two-way frequency table.
TableMultiWay	Tallies observations into a multi-way frequency table.
Sort	Sorts observations by specified keys.
Ranks	Computes the ranks, normal scores, or exponential scores for a vector of observations.
EmpiricalQuantiles	Determines empirical quantiles.

VARIANCES, COVARIANCES, AND CORRELATIONS

CLASS	DESCRIPTION
Covariances	Computes the sample variance-covariance or correlation matrix.
PartialCovariances	Computes the partial covariances or partial correlations from an input covariance or correlation matrix.

REGRESSION

CLASS	DESCRIPTION
RegressorsForGLM	Generates regressors for a general linear model from a data matrix.
LinearRegression	Computes a new linear regression object using least squares.
NonlinearRegression	Fits a multivariate nonlinear regression model using least squares.
UserBasisRegression	Generates summary statistics using user-supplied functions in a nonlinear regression model.
SelectionRegression	Selects the best multiple linear regression models.
StepwiseRegression	Builds multiple linear regression models using forward selection, backward selection, or stepwise selection.

ANALYSIS OF VARIANCE

CLASS	DESCRIPTION
ANOVA	Provides an Analysis of Variance table and related statistics.
ANOVAFactorial	Analyzes a balanced factorial design with fixed effects.
ANCOVA	Analyzes a one-way factorial classification model with covariates.
MultipleComparisons	Performs Student-Newman-Keuls multiple comparisons test.

CATEGORICAL AND DISCRETE DATA ANALYSIS

CLASS	DESCRIPTION
ContingencyTable	Provides an Analysis of Variance table and related statistics.
CategoricalGenLinModel	Analyzes categorical data using logistic, probit, Poisson, and other generalized linear models.

NONPARAMETRIC STATISTICS

CLASS	DESCRIPTION
SignTest	Performs a sign test.
WilcoxonRankSum	Performs a Wilcoxon rank sum test.

GOODNESS OF FIT

CLASS	DESCRIPTION
ChiSquaredTest	Chi-squared goodness-of-fit test.
NormalityTest	Performs a test for normality.
KolmogorovOneSample	Performs a Kolmogorov-Smirnov goodness-of-fit test in one sample.
KolmogorovTwoSample	Computes Kolmogorov-Smirnov two-sample test statistics for testing that two continuous cumulative distribution functions (CDF's) are identical based upon two random samples.

TIME SERIES AND FORECASTING

CLASS	DESCRIPTION
AutoCorrelation	Computes the sample autocorrelation function of a stationary time series.
ARAutoUnivariate	Automatically determines the best autoregressive time series model using Akaike's Information Criterion.
ARSeasonalFit	Estimates the optimum seasonality parameters for a time series using an autoregressive model, *AR*(*p*), to represent the time series.
ARMA	Computes least-square estimates of parameters for an ARMA model. Also computes forecasts and their associated probability limits for an ARMA model.
ARMAEstimateMissing	Estimates missing values in a time series collected with equal spacing. Missing values can be replaced by these estimates prior to fitting a time series using the ARMA class.
ARMAMaxLikelihood	Computes maximum likelihood estimates of parameters for an ARMA model with *p* and *q* autoregressive and moving average terms respectively.
ARMAOutlierIdentification	Detects and determines outliers and simultaneously estimates the model parameters in a time series whose underlying outlier free series follows a general seasonal or nonseasonal ARMA model.
AutoARIMA	Automatically identifies time series outliers, determines parameters of a multiplicative seasonal model and produces forecasts that incorporate the effects of outliers whose effects persist beyond the end of the series.
CrossCorrelation	Computes the sample cross-correlation function of two stationary time series.
Difference	Differences a seasonal or nonseasonal time series.
Garch	Computes estimates of the parameters of a GARCH(*p*, *q*) model.
KalmanFilter	Performs Kalman filtering and evaluates the likelihood function for the state-space model.
LackOfFit	Performs lack-of-fit test for a univariate time series or transfer function given the appropriate correlation function.
MultiCrossCorrelation	Computes the multichannel cross-correlation function of two mutually stationary multichannel time series.

MULTIVARIATE ANALYSIS

CLASS	DESCRIPTION
ClusterKMeans	Performs a *K*-means (centroid) cluster analysis.
Dissimilarities	Computes a matrix of dissimilarities (or similarities) between the columns (or rows) of a matrix.
ClusterHierarchical	Performs a hierarchical cluster analysis given a distance matrix.
FactorAnalysis	Performs Principal Component Analysis or Factor Analysis on a covariance or correlation matrix.
DiscriminantAnalysis	Performs a linear or a quadratic discriminant function analysis among several known groups.

SURVIVAL AND RELIABILTY ANALYSIS

CLASS	DESCRIPTION
KaplanMeierEstimates	Computes Kaplan-Meier (or product-limit) estimates of survival probabilities for a sample of failure times that possibly contain right censoring.
KaplanMeierECDF	Computes the Kaplan-Meier reliability function estimates or the CDF based on failure data that may be multi-censored.
LifeTables	Computes population (current) or cohort life tables based upon the observed population sizes at the middle (for population table) or the beginning (for cohort table) of some user specified age intervals.
ProportionalHazards	Analyzes survival and reliability data using Cox's proportional hazards model.

PROBABILITY DISTRIBUTION FUNCTIONS AND INVERSES

CLASS	DESCRIPTION
CDF	Cumulative distribution functions.
InvCdf	Inverse cumulative probability distribution functions.
PDF	Probability density functions.
InverseCdf	Evaluates the inverse of a continuous, strictly monotone function.
GammaDistribution	Evaluates a gamma probability distribution.
LogNormalDistribution	Evaluates a lognormal probability distribution.

PROBABILITY DISTRIBUTION FUNCTIONS AND INVERSES

CLASS	DESCRIPTION
NormalDistribution	Evaluates a normal (Gaussian) probability distribution.
PoissonDistribution	Evaluates a Poisson probability distribution.

RANDOM NUMBER GENERATION

CLASS	DESCRIPTION
FaureSequence	Generates the low-discrepancy shuffled Faure sequence. This is also called a quasi-random generator.
MersenneTwister	Generates uniform pseudorandom 32-bit numbers with a period of $2^{19937}-1$ and a 623-dimensional equidistribution property.
MersenneTwister64	Generates uniform pseudorandom 64-bit numbers with a period of $2^{19937}-1$ and a 623-dimensional equidistribution property.
Random	Random number generators with support for several distributions.

Imsl.Datamining Namespace

Imsl.Datamining

Imsl.Datamining namespace contains data mining classes including Naïve Bayes classsifer.

DATAMINING	
CLASS	**DESCRIPTION**
NaiveBayesClassifier	Trains a Naïve Bayes Classifier.

Imsl.Datamining.Neural Namespace

Imsl.Datamining.Neural

Imsl.Datamining.Neural namespace contains feed forward multilayer neural network training and forecasting engines plus algorithms to facilitate data pre- and post-processing.

NEURAL NETS

CLASS	DESCRIPTION
Network	A neural network.
FeedForwardNetwork	A feed forward neural network.
Layer	The base class for the input, hidden, and output layers in a neural network.
InputLayer	The input layer in a neural network.
HiddenLayer	The hidden layer in a neural network.
OutputLayer	The output layer in a neural network.
Node	A node with an input node or perceptron in a neural network.
InputNode	A node in the input layer.
Perceptron	A perceptron node in a neural network.
OutputPerceptron	A perceptron in the output layer.
Activation	An activation function.
Link	A link in the neural network between two network nodes.
QuasiNewtonTrainer	Trains a feed forward network using quasi-Newton optimization.
LeastSquaresTrainer	Trains a feed forward network using the Levenberg-Marquardt nonlinear least squares algorithm.
EpochTrainer	A two-stage trainer. Stage I trains using epochs of randomly selected training patterns. Stage II uses all training patterns and is optional.
BinaryClassification	Classifies patterns into two categories.
MultiClassification	Classifies patterns into multiple categories.
ScaleFilter	Scales or unscales continuous data prior to its use in neural network training, testing, or forecasting.
UnsupervisedNominalFilter	Encodes nominal data into a series of binary columns for input into a neural network. It also decodes binary columns in a single column of nominal values.

NEURAL NETS

CLASS	DESCRIPTION
UnsupervisedOrdinalFilter	Encodes ordinal data into cumulative percentages. It also decodes cumulative percentages into an ordinal variable.
TimeSeriesFilter	Converts time series data to a format used for neural network training by lagging an input series into several columns, one for each lag requested.
TimeSeriesClassFilter	Converts categorized time series data to a format used for neural network training. An input series is lagged into several columns, one for each lag requested. Lagging is calculated within each class of a nominal variable.

Imsl.Finance Namespace

Imsl.Finance

Imsl.Finance namespace contains a set of classes covering a variety of investment calculations including an extensive collection of bond functions.

FINANCE	
CLASS	**DESCRIPTION**
Finance	Collection of finance functions including depreciations, present values, and internal rate of return methods.
Bond	Collection of bond functions including interest, and price and yield methods.
DayCountBasis	Rules for computing the number or days between two dates or number of days in a year. For many securities, computations are based on rules other than on the actual calendar.

Imsl.Chart2D Namespace

Imsl.Chart2D

The Imsl.Chart2D namespace is designed to allow the creation of highly customizable 2D charts. Supported chart types include:

- Scatter plots
- Candlestick charts
- Line plots
- Pie Charts
- Dendrogram chart
- Area plots
- Bar Charts
- Function plots
- Histograms
- Log and Semilog plots
- Polar plots
- Error Bars
- Contour Plot
- High-Low-Close-Open charts
- Box plot
- Heat Map
- Tree Map

IMSL C# chart class can be used in Windows.Forms applications as well as ASP.NET applications

CHART2D CLASSES

CLASS	DESCRIPTION
Annotation	Draws an annotation.
Axis	The axis node provides the mapping for all of its children from the user coordinate space to the device (screen) space.
Axis1D	Controls an x-axis or a y-axis.
AxisLabel	Controls the labels on an axis.
AxisLine	Controls the axis line.
AxisRLabel	Controls the labels on a radial axis.
AxisR	Controls the R-axis in a polar plot.
AxisRLine	Controls the radius axis line in a polar plot.
AxisRMajorTick	Controls the major tick marks for the radius axis in a polar plot.
AxisTheta	Controls the angular axis in a polar plot.
AxisTitle	Controls the title on an axis.
AxisUnit	Controls the unit title on an axis.
AxisXY	Controls the axes for an x-y chart.
Background	Controls the background of a chart.
Bar	A bar chart.

CHART2D CLASSES

CLASS	DESCRIPTION
BarItem	Controls a single bar in a bar chart.
BarSet	Controls a set of bars in a bar chart.
BoxPlot	Draws a multi-group box plot.
Candlestick	Candlestick plot of stock data.
CandlestickItem	Controls a candlestick for the up days or the down days.
Chart	The root node of the chart tree.
ChartNode	The base class of all of the nodes in the chart tree.
ChartSpline	Wraps a spline into a ChartFunction to be plotted.
ChartTitle	Controls the main title of a chart.
Colormap_Fields	Maps from a unit interval to Colors, creating a one dimensional parameterized path through the color cube.
Contour	A contour chart shows level curves of surface data.
Data	Draws a data node.
Dendrogram	A graphical way to display results from a hierarchical cluster.
Draw	Chart tree renderer. Draws the chart tree to the output device.
DrawMap	Creates an HTML client-side imagemap from a chart tree.
DrawPick	Pick an object in a chart.
ErrorBar	Data points with error bars.
FillPaint	A collection of methods to create Paint objects for fill areas.
Grid	Draws the grid lines perpendicular to an axis.
GridPolar	Draws the grid lines for a polar plot.
Heatmap	Creates a chart from an array of Color values, combined with the data range represented by that array.
HighLowClose	High-low close plot of stock data.
Legend	Controls the chart legend.
MajorTick	Controls the major tick marks.
MinorTick	Controls the minor tick marks.
PanelChart	A Windows.Forms.Panel that contains a chart.
PickEventArgs	An event that indicates a chart element has been selected.
Pie	A pie chart.
PieSlice	Control one wedge of a pie chart.

CHART2D CLASSES

CLASS	DESCRIPTION
Polar	This axis node is used for polar charts.
SplineData	A data set created from a Spline.
Text	The value of the attribute “Title”.
ToolTip	A ToolTip for a chart element.
TransformDate	Defines a transformation along an axis that skips weekend dates.
Treemap	Treemap creates a chart from two arrays of double precision values or one data array and one array of Color values.
WebChart	A WebChart provides a component to use in ASP.NET applications that holds a Chart object.

Imsl.Chart2D.QC Namespace

Imsl.Chart2D.QC

The Imsl.Chart2D.QC namespace contains a variety of quality control charts used to monitor business and manufacturing processes. Supported chart types include:

- Shewhart control charts
- XbarS
- Pchart
- CuSum
- ControlLimit
- SChart
- CChart
- CuSumStatus
- XbarR
- XmR
- UChart
- RChart
- NpChart
- EWMA
- Pareto

QUALITY CONTROL CHARTS

CLASS	DESCRIPTION
ShewhartControlChart	The base class for the Shewhart control charts.
ControlLimit	A control limit line on a process control chart.
XbarR	An X-bar chart for monitoring a process using sample ranges.
RChart	An R-chart using sample ranges to monitor the variability of a process.
XbarS	An X-bar chart for monitoring a process using sample standard deviations.
SChart	An S-chart using sample standard deviations to monitor the variability of a process.
XmR	A chart for monitoring a process using moving ranges.
NpChart	An np-chart for monitoring the number of defects when defects are not rare.
PChart	A p-chart for monitoring the defect rate when defects are not rare.
CChart	A c-chart for monitoring the count of the number of defects when defects are rare.
UChart	A u-chart for monitoring the defect rate when defects are rare.
EWMA	An exponentially weighted moving average control chart.
CuSum	A cumulative sum chart.
CuSumStatus	A cumulative sum status chart.
ParetoChart	A Pareto bar chart.