



7 Professional Developer ~ Enterprise Developer Comprehensive Feature List

S PROGRAMMING LANGUAGE

The award-winning S programming language is at the core of S-PLUS. The only language created specifically for exploratory data analysis and statistical modeling, the S programming language allows you to create statistical applications up to five times faster than with other languages.

- Object-oriented, interpreted 4GL language
- Interactive exploration and fast prototyping
- Rich data structures: vector, matrix, array, data frame, list, and many more
- User-defined functions, objects, classes, methods, and libraries
- Library of 4000 functions for data manipulation, graphics, statistical modeling, and integration

GRAPHICAL USER INTERFACE

A convenient window-based GUI puts common tasks at your fingertips with easy-to-use menus and dialogs.

- File import and export dialogs
- Database import and export dialogs¹
- Dialogs for data preparation, charting, and statistical modeling
- Interactive command-line with history recall
- Manage objects with Object Explorer¹
- Script file editor¹
- Multiple data and graphics windows
- Cut-and-paste to Word, PowerPoint®, and Excel¹
- Integrated Excel spreadsheets¹
- PowerPoint Wizard: quickly create slides from charts¹
- Create custom toolbars, menus, and dialogs¹
- On-line help and manuals

POINT-AND-CLICK CHARTING¹

Control over every detail of your graphs makes it easy to produce stunning, publication-quality output.

- Convenient 2-D and 3-D plot palettes with over 80 pre-defined charts
- 2-D scatter plots, histograms, pie charts, box plots, pairwise scatter plots, bar plots, Pareto plots, probability plots, density plots, dot charts, quantile-quantile plots, strip plots, and more
- 3-D point clouds, surface plots, contour plots, color image plots, and more
- Time series plots: line plots, high-low open-close, candlestick, stacked bar
- Exclusive Trellis™ graphics: drag-and-drop variables to create side-by-side conditioned views
- Overlay titles, legends, best-fit or smoothing lines, and many other annotations
- Interactively change line weights, axes, colors, labels, fonts, symbol types, and more
- Select points and highlight in linked charts
- Flexible layout of multiple graphs and pages
- Wizards to create graphs within SPSS® and Excel

S-PLUS WORKBENCH DEVELOPMENT ENVIRONMENT⁴

Rapidly create reliable statistical applications with this integrated development environment for S programmers.

- Based on industry-standard Eclipse™ framework

- Check in and check out files with source code control system integration
- Intelligent editor for S programs with line numbering, automatic indentation, and syntax highlighting
- Project, file, and task management
- Automatic syntax error detection
- Code outline browser
- Command-line console with history recall
- Object and search path views

SCALABLE PIPELINE ARCHITECTURE²

Scale statistical applications to gigabytes of data without the need for additional RAM or 64-bit architectures with this library of data types and functions for programming with large data sets.

- Data types for out-of-memory vectors, data frames, and time series
- Familiar S functions, operators, and programming style
- Scalable algorithms for data manipulation, charting, and modeling
- High-performance data preparation tools: aggregate, merge, sort, partition, filter, and more
- Data manipulation using built-in SQL processor
- Hexagonal binning plots to explore structure of large data sets
- Scalable model estimation: univariate statistics, linear regression, analysis of variance, logistic regression, Poisson regression, quasi-likelihood, K-means clustering, principal components
- Scalable model scoring for more than 20 model types

GRAPHICAL FUNCTIONS

Explore data and create custom charts with this library of graphical functions in the S language.

- Scatter plots, histograms, pie charts, box plots, bar charts, dot charts, time series charts, 3-D wireframe charts, image plots, and many more
- Brush and spin dynamic visualization
- Programmatic control over colors, lines, axes, annotations, and layout
- Unique Trellis™ graphics—create multiple charts conditioned by levels of one or more variables
- Create interactive, embedded Web-based charts with S-PLUS Graphlets™

INTEGRATION

S-PLUS is an open system, designed to integrate with the systems you already have in place.

Data and graphics formats

- ASCII: fixed format, comma-separated, and tab-delimited
- Spreadsheets: Excel, Lotus 123™, and Quattro Pro™
- Application data: SAS® 7/8/9, SPSS®, and Matlab®, Minitab®, Sigma Plot®, SYSTAT®, STATA®, GAUSS®, Epi Info™, and more
- Database files: Paradox®, dBASE™, Access™, and FoxPro™
- Financial data sources: LIM, Bloomberg, FAME
- Native database clients: SQL Server¹, Oracle®, Sybase®, and DB2®

- ODBC interface to compliant databases¹
- Export graphics as PDF, PostScript, GIF, PNG, JPG, WMF, bitmap, TIFF, and more

APIs and system interfaces

- APIs for C, C++, Java®, and Fortran™
- Language support for pipes, sockets, and files
- DDE, COM, and OLE interfaces¹
- XML import and export
- Reporting in XML, PDF, HTML, and RTF
- Batch mode with verbose logging

STATISTICAL & NUMERICAL TECHNIQUES

S-PLUS is the most comprehensive statistical analysis package available, and includes all of the following capabilities:

Basic Statistics

- Summary statistics
- Crosstabulations
- Correlation and covariance
- Probabilities, quantiles, densities, and random number generation from many distributions
- Durbin-Watson statistic

Hypothesis Tests and Confidence Intervals

- One-sample and two-sample t-test and Wilcoxon
- Paired t-test
- Correlation: Pearson, Kendall's tau, Spearman's rho
- Goodness-of-Fit: Chi-square, Kolmogorov-Smirnov

Shapiro-Wilk

- Rank tests: Kruskal-Wallis, Friedman
- Proportions: exact Binomial test, Normal approximation
- Contingency tables and tests for independence: Chi-square, Fisher, Mantel-Haenszel, McNemar

Regression

- Basic linear regression
- Polynomial regression
- Model diagnostics
- Prediction and confidence intervals
- Stepwise selection of models
- Parametric spline models
- Constrained regression
- Logistic regression
- Generalized linear models

Analysis of Variance

- Univariate and multivariate ANOVA
- Flexible specification of variables, covariables, interactions, nesting, transformations
- Automatic generation of dummy variables
- Choice of contrasts
- Type III sums of squares
- Designed experiments: one-way, two-way, factorial, split-plot, unbalanced, fractional factorial designs, response surface methods, robust designs, Taguchi methods, and more
- Variance component estimation
- Multiple comparisons: Fisher, Tukey, Dunnett, Sidak, Bonferroni, Scheffé, simulation-based

Nonlinear Regression and Maximum Likelihood

- Nonlinear regression
- Nonlinear maximum likelihood
- Quasi-likelihood
- Constrained nonlinear regression

Nonparametric Regression

- Generalized additive models (GAMs)
- Smoothers: loess, super, kernel, spline
- Projection Pursuit, ACE, and AVAS

Tree Models

- Classification trees
- Regression trees
- Pruning, shrinking, and splitting
- Scoring

Correlated Data Analysis

- Longitudinal data and repeated measures analysis
- Linear (LME), nonlinear (NLME), and Generalized Mixed Effects (GLMM) Models
- Generalized Estimating Equations (GEE)
- Biexponential, first-order compartment, four-parameter logistic models
- User-defined correlation structures

Resampling

- Bootstrap
- Jackknife

Multivariate Analysis

- Canonical correlation
- Discriminant analysis
- Factor analysis
- Multidimensional scaling
- Principal components
- Biplots

Cluster Analysis

- K-means
- Hierarchical clustering
- Monothetic clustering
- Model-based clustering
- Crisp and fuzzy clustering
- Divisive and agglomerative methods

Quality Control

- Shewhart chart
- Cusum chart
- Charts based on \bar{x} , s , np , p , c , u

Power and Sample Size

- Normal mean
- Binomial proportion

Survival Analysis

- Kaplan-Meier curves
- Cox proportional hazards models with mixed effects
- Left, right, and interval censoring
- Time-dependent covariates and strata
- Multiple event models
- Competing risk models
- Frailty models
- Parametric survival
- Expected survival
- Person years analysis
- Aalen's additive regression model

Time Series Analysis

- Autocovariance, autocorrelation, and partial autocorrelation
- Smoothed periodograms
- Box-Jenkins ARIMA models
- Classical and robust AR
- Long-memory models
- Seasonal decompositions
- Fourier transformations
- Classical and robust smoothers and filters

Robust Statistics

- Robust estimation and inferences
- Robust MM regression
- Robust GLM, ANOVA, covariance, principal components, and discriminant analysis
- Least trimmed squares regression
- Minimum absolute residual regression
- Visually compare robust and traditional methods

Missing Data

- Multiple imputation
- Gaussian, logistic, and conditional Gaussian models

Date, Time, and Calendar Data

- Univariate and multivariate time series
- Aggregation, alignment, merging, and interpolation
- Times and dates from milliseconds to millennia
- Time zones with international daylight savings rules
- Holidays and financial market closures
- Custom time and date formats
- Relative time, time sequence, and event objects
- Powerful time-series charting

Mathematical Computations

- Vector and matrix algebra
- Matrix decompositions
- Systems of linear equations
- Locate roots
- Nonlinear optimization
- Constrained optimization
- Ordinary differential equations
- Numerical integration

ADDITIONAL LIBRARIES

Libraries from Insightful Research and the S-PLUS user community offer additional capabilities.

- MASS: Modern and Applied Statistics libraries (Venables, Ripley) included
- Hmisc and Design libraries for biostatistical and epidemiologic modeling (Harrell) included
- Insightful Research libraries available for download

ADD-ON MODULES

Optional modules add additional capabilities to S-PLUS:

- S+ArrayAnalyzer[®]: microarray analysis¹
- S+EnvironmentalStats[™]: environmental statistics¹
- S+FinMetrics[™]: financial econometrics³
- S+NuoPT: large-scale constrained optimization³
- S+SeqTrial[™]: clinical trial design and analysis¹
- S+SpatialStats[™]: analysis of spatial data
- S+Wavelets[™]: wavelet and signal series analysis

SUPPORTED PLATFORMS

- Windows[®] 2000, XP Home, XP Professional
- Windows 2003 (Intel[®] P)
- Sun[®] Solaris[®] (SPARC[™])
- Red Hat[®] Linux[®] (Intel)
- HP-UX[®] (PA-RISC[®])
- IBM[®] AIX[®]

¹ Windows Platform Only

² S-PLUS Enterprise Developer Only

³ Windows, Linux and Solaris Only

⁴ Not Available on HP-UX Platform



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Insightful Corporation (NASDAQ:IFUL) provides enterprises with scalable data analysis solutions that drive better decisions faster by revealing patterns, trends and relationships. The Company is a leading supplier of software and services for statistical data analysis, data mining and knowledge access enabling clients to gain intelligence from numeric and text data.

Insightful products include S-PLUS[®], Insightful Miner[™], and InFact[®]. Insightful consulting services provide specialized expertise and proven processes for the design, development and deployment, of customized solutions. The company has been delivering industry-leading, high-ROI solutions to thousands of companies in financial services, life sciences, telecommunications, manufacturing, plus government and research institutions.

Headquartered in Seattle, Insightful has offices in New York City, North Carolina, France, Switzerland, and the United Kingdom, with distributors around the world.