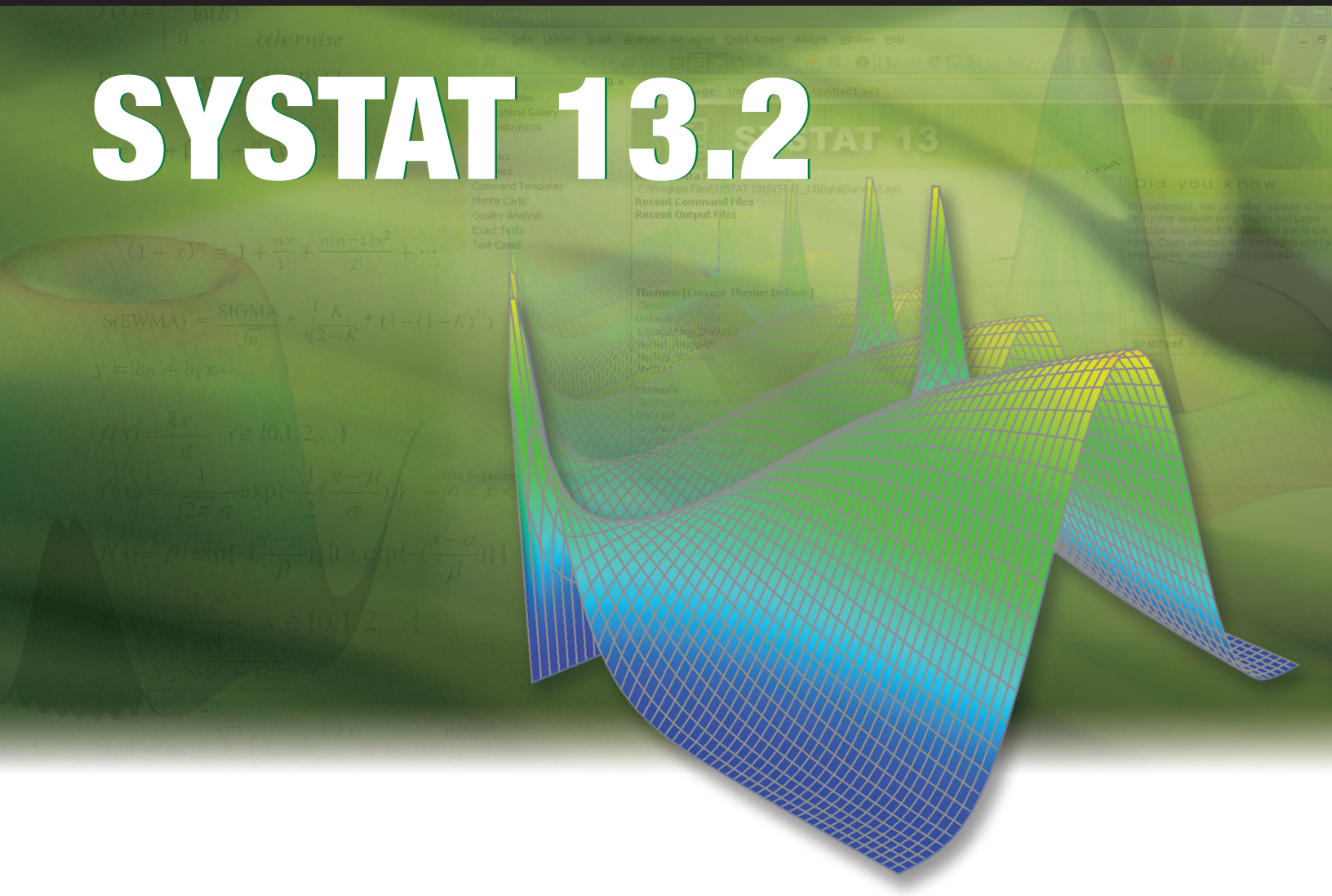
SYSTAT 13.2



More Statistics, More Graphs, Less Effort!

SYSTAT®

SYSTAT 13.2

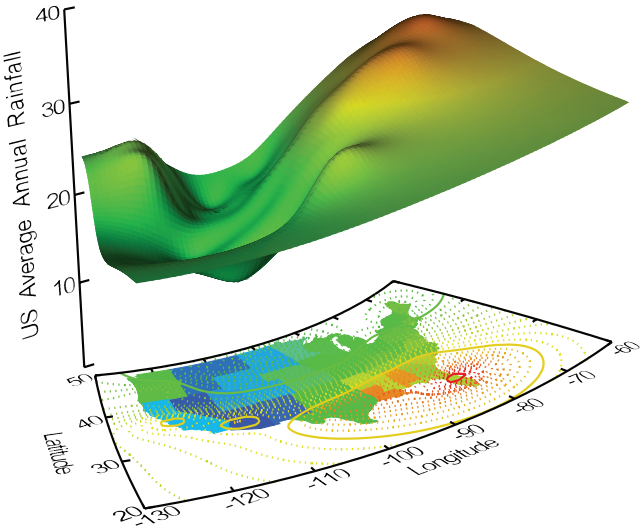
More Statistics, More Graphs, Less Effort

SYSTAT is a comprehensive desktop statistics package that is simple enough for beginners, yet powerful enough for experts. It gives you a broad portfolio of complex statistical methods – with robust simulation and scripting capabilities – all inside a customizable and user-friendly interface.

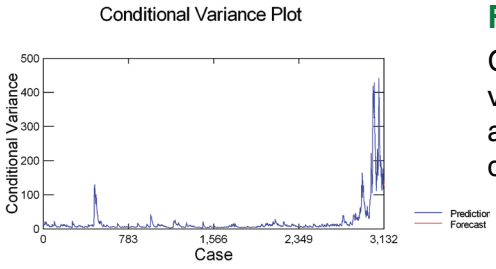
SYSTAT13.2 is quicker, sturdier and more robust than any of its predecessors. Newly improved data handling functionality allows the software to process larger data sets, at speeds faster than ever before.

SYSTAT's well-known 2D and 3D graphics are better than ever, this time with greater control and more colors to choose from, giving punch to your presentations and publications.

Take a look at all that SYSTAT 13.2 has to offer.

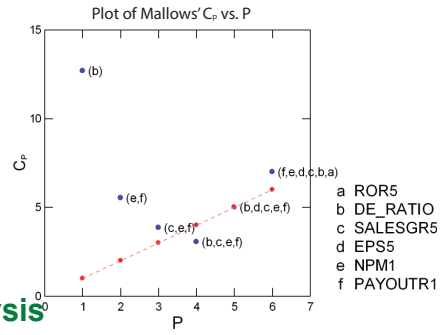


EVEN MORE STATISTICS…



Forecast Time Series Error Variance with ARCH and GARCH

Conventional time series and econometric models assume that the conditional variance of a series is consistent over time, which may not always be true. ARCH and GARCH models use the past disturbances and variances in your time series data to accurately describe and account for future volatility.



Find the Best Predictors with Best Subsets Regression

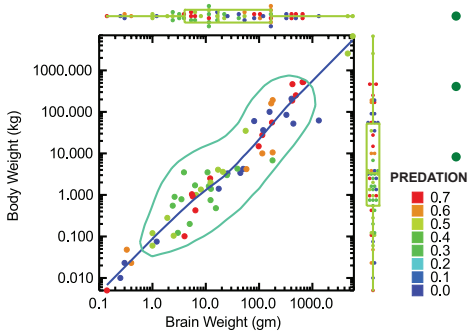
BSR seeks to identify a small number of the best predictors in a trial set. It is especially helpful in situations where it might not be clear which predictors will end up being the most useful, especially in the areas of economics, ecology and the environment.

Examine the Fitness of Statistical Models Using Confirmatory Factor Analysis

SYSTAT's Confirmatory Factor Analysis makes it easier to develop surveys, and test the fitness of behavioral, economic, marketing and social research models.

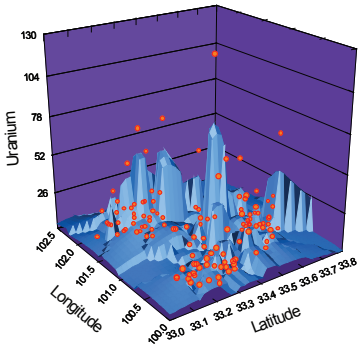
Explore SYSTAT 13.2's Improvements to Its Existing Statistical Methods

Enjoy more robust testing, regression and cross-tabulation features with SYSTAT 13.2. Some of the new improvements include:



- Hypothesis testing now includes testing for mean vectors, univariate bootstrapping, and a new column-based input layout.
- Polynomial Regression offers you useful and accurate prediction models for curvilinear-related variables.
- Non-parametric Test Suite now includes:
  - Jonckheere-Terpstra and Flinger-Wolfe tests for structured treatment applications
  - New multiple comparison tests (Dwass-Steel-Critchlow-Flinger, Conover-Inman and Conover)

EVEN MORE GRAPHS...

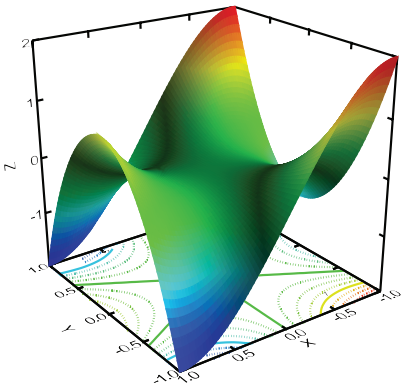


Add Polish to Your Research with Stunning 2D and 3D Graphs

SYSTAT 13.2 renders visually compelling 2D graphics perfect for publication, and incredible 3D graphics that bring an incredible wow-factor to any research or business presentation.

Create and Edit Graphs with Ease Using SYSTAT's Graphics Tools

SYSTAT 13.2 comes packed with new graphical editing features, such as:



- **Richer Color Choices:** Specify any color for your graphs from their red, green and blue component values.
- **New Editing Capabilities:** Edit graph size, color, axes, legends, border display, etc. using interactive dialog boxes.
- **New Color Gradient Editing:** SYSTAT 13.2 gives you precise control over gradient color and style on 3D graph surfaces.
- **New Graph Labeling Features:** Generate numeric case labels in plots, multivariate displays and maps. Label the dots in dot plots.

EVEN LESS EFFORT !

Analyze Larger Data Sets with Greater Speed

SYSTAT 13.2 has been engineered to handle even larger datasets than before. SYSTAT 13.2 computes statistical methods up to 10 times faster than older versions on most problems.

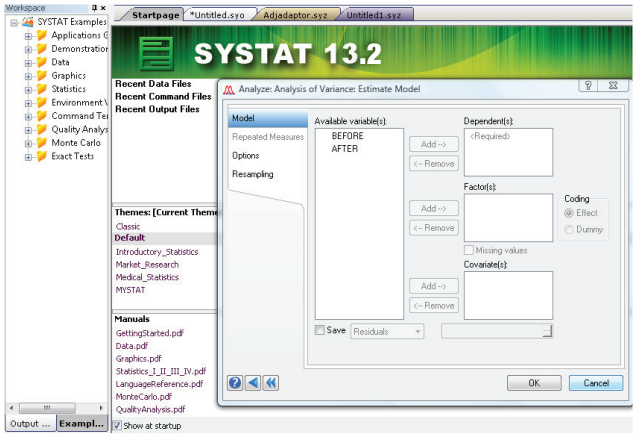
Case	Label	Total Score	Mean Score	IRT Ability	Standard Error
1	1.000	4.000	0.444	-0.116	0.416
2	1.000	1.000	0.111	-1.524	0.599
3	1.000	1.000	0.111	-1.524	0.599
4	1.000	2.000	0.222	-0.925	0.488
5	1.000	2.000	0.222	-0.925	0.488
6	7.000	1.000	0.111	-1.524	0.599
7	7.000	1.000	0.111	-1.524	0.599
8	7.000	1.000	0.111	-1.524	0.599
9	7.000	1.000	0.111	-1.524	0.599
10	7.000	1.000	0.111	-1.524	0.599
11	7.000	1.000	0.111	-1.524	0.599
12	7.000	1.000	0.111	-1.524	0.599
13	1.000	Item	Label	Item P	Difficulty	Standard Error
14	1.000	1	POUNDING	0.897	-1.625	0.192
15	1.000	2	SINKING	0.770	-0.999	0.152
16	1.000	3	SHAKING	0.529	-0.144	0.136
17	1.000	4	NAUSEOUS	0.586	-0.334	0.137
18	1.000	5	STIFF	0.506	-0.069	0.136
19	1.000	6	FAINT	0.414	0.238	0.138
		7	TREMOR	0.333	0.526	0.145
		8	SHIVER	0.161	1.315	0.185
		9	WEAK	0.034	2.501	0.331

Speed Up Scripting and Data Entry with Enhanced Auto-complete and Token Dialog

Enter SYSTAT script commands easily and avoid spelling errors with SYSTAT 13.2's enhanced auto-complete functionality. Get automatic options for file and variable names and option values. Also, SYSTAT 13.2 features a token dialog, allowing you to select variable value options from drop-down menus during data entry. SYSTAT 13.2 gives you greater control over the data entry process, drastically reducing entry error.

Secure Your Work with SYSTAT's Rescue Report

Rescue Report saves your data, commands and outputs in the event of a system crash or reboot. With the Rescue Report Dialog, you receive options on restoring your session. Also, your data, command and output files will be automatically attached to an email so that the SYSTAT support team can provide you with fast help.



Experience the Enhanced Look and Feel

SYSTAT 13.2 features a completely rebuilt data editor which gives you greater control and flicker-free viewing. Also, a Data Navigation Toolbar has been added to allow you to jump easily to any desired case of any specific variable. The SYSTAT interface and dialog boxes have been updated to give you a better overall user experience.

Customize SYSTAT Menus and Configuration with New Themes

Choosing from SYSTAT's pre-configured themes is easier than ever. SYSTAT 13.2 displays all themes available for download, and gives expanded information on each theme. Choose form one of our many options, or configure your own customized look and feel.

Get More Out of Your New Version of SYSTAT with a Host of New Features

Use the wide range of new features that **SYSTAT 13.2** brings to you, especially designed to make your analysis easier than ever before. For example, you can get instant information about all the procedures you need, with the Bubble Help. Perform real-time analysis and enhance the power of your analysis with greater customization than ever before.

STATISTICS

Descriptive Statistics

- **Column**
  - Arithmetic mean, median, sum and number of cases
  - Minimum, maximum, range and variance
  - Coefficient of variation, standard error of mean
  - Adjustable confidence intervals of mean
  - Skewness, kurtosis, and their standard errors
  - Shapiro-Wilk normality test
  - N- & P- tiles: Cleveland, weighted average 1, weighted average 2, weighted average 3, closest, empirical CDF, empirical CDF (average),
  - Geometric and harmonic means
  - Trimmed mean, its standard error and confidence interval
  - Winsorized mean, its standard error and confidence interval
  - Mode, interquartile range
  - Stem-and-Leaf display
  - Resampling: Bootstrap, without replacement, Jackknife
  - Bootstrapped estimates, bias and confidence intervals
  - Environment variables
- **Row**
  - Arithmetic mean, median, sum and number of cases
  - Minimum, maximum, range and variance
  - Coefficient of variation, standard error of mean
  - Adjustable confidence intervals of mean
  - Skewness, kurtosis, and their standard errors
  - Shapiro-Wilk normality test
  - N- & P- tiles: Cleveland, weighted average 1, weighted average 2, weighted average 3, empirical CDF, empirical CDF (average), closest
  - Geometric and harmonic means
  - Trimmed mean, its standard error and confidence interval
  - Winsorized mean, its standard error and confidence interval
  - Mode, interquartile range
  - Stem-and-Leaf display
  - Resampling: Bootstrap, without replacement, Jackknife
  - Bootstrapped estimates, bias and confidence intervals
- **Multivariate skewness and kurtosis**
  - Multivariate normality tests based on skewness and kurtosis, Henze-Zirkler test

Probability Distributions

- **44 distributions**
  - Discrete: Discrete uniform, Zipf, geometric, hypergeometric, negative binomial, Poisson, binomial, Benford, logarithmic series

city-block, Bray-Curtis, QSK
- Rank order data: Spearman, gamma, mu2, tau-b, tau-c
- Unordered data: Phi, Cramer's V, contingency, Goodman-Kruskal's lambda, uncertainty coefficients
- Binary data: S2, S3, S4, S5, S6, S7, Tetrachoric, Yule's Q, Hamman, Dice, Sneath, Ochiai, Kulczynski, Gower2
- Missing data: Pairwise or listwise deletion, EM or Hadi outlier detection and estimation
- Probabilities: Bonferroni, Dunn-Sidak
- Quick Graph: Scatterplot matrix
- Resampling: Bootstrap, without replacement, Jackknife
- Bootstrapped estimates, bias and confidence intervals in the case of Pearson correlations and rank-ordered data

Set and Canonical Correlation

- Whole, semi and bipartial set correlations
- Rao F, R^2, Shrunk R^2, T^2, Shrunk T^2, P^2, Shrunk P^2, within, between and inter-set correlations
- Row/Column betas, standard errors, T-statistics and probabilities
- Stewart-Love canonical redundancy index
- Canonical coefficients, loadings and redundancies
- Varimax rotation
- Resampling: Bootstrap, without replacement, Jackknife

Cronbach's Alpha

- Resampling: Bootstrap, without replacement, Jackknife

Missing Value Analysis

- EM algorithm
- Regression imputation
- Save estimates, correlation, covariance, SSCP matrices
- Resampling: Bootstrap, without replacement, Jackknife

Loglinear Models

- Full maximum likelihood
- Pearson and likelihood ratio chi-squares
- Expected values, lambda, standard error of lambda
- Covariance matrix, correlation matrix
- Deviates, Pearson deviates, likelihood deviates, Freeman-Tukey deviates, log-likelihood
- Resampling: Bootstrap, without replacement, Jackknife
- Dialog box with facility to type the desired model directly

Linear Regression

- **Least-squares**
  - Cross validation, saving residuals and diagnostics, Durbin-Watson statistic
  - Multiple linear regression
  - Save standard errors and confidence intervals

binary and multinomial response models
- AIC, AICc, BIC computation
- Robust standard errors
- Dummy variables and interactions
- Deciles of risk, quantiles and simulation
- Quick Graph: ROC curve for binary logistic regression
- Forward, backward, automatic and interactive stepwise regression

Probit Regression

- Dummy variables and interactions
- AIC, AICc, BIC computation

Nonlinear Regression

- Gauss-Newton, Quasi--Newton, Simplex
- Output: Predicted values, residuals, asymptotic standard errors and correlations, confidence curves and regions
- Special features: Cook-Weisberg confidence intervals, Wald intervals, Marquardting
- Robust estimation: Absolute, power, trim, Huber, Hampel, t, Tukey's bisquare, Ramsay, Andrews
- Maximum likelihood estimation
- Piecewise regression, kinetic models, logistic model for quantal response data
- Exact derivatives
- Quick Graph: scatterplot with fitted curve
- Resampling: Bootstrap, without replacement, Jackknife

Two-Stage Least-Squares

- Heteroscedasticity-consistent standard errors
- Polynomially distributed lags

Smooth & Plot

- 126 non-parametric smoothers including LOESS
- Windows: Fixed width or nearest neighbors
- Kernels: Uniform, Epanechnikov, biweight, triweight, tricube, Gaussian, Cauchy
- Method: Median, mean, polynomial, robust, trimmed mean
- Save predicted values and residuals
- Resampling: Bootstrap, without replacement, Jackknife

Mixed Model Analysis

- Variance components and linear mixed model structures
- Estimates of parameters by
  - Maximum likelihood (ML)
  - Restricted maximum likelihood (REML)
  - MIVQUE(0) in the case of variance components
  - ANOVA in the case of variance components
  - Confidence intervals and hypothesis tests based on these estimates
- Structures of covariance matrix of random effects

or more factors
- Designs: Unbalanced, randomized block, complete block, fractional factorial, mixed model, nested, split plot, Latin square, crossover & change over, Hotelling's T^2
- Means model for missing cells designs
- Mixed categorical and continuous variables
- Stepwise model building
- AIC, AICc, BIC computation
- Post-hoc tests
- Resampling: Bootstrap, without replacement, Jackknife
- See also Linear regression and ANOVA

Quality Analysis

- Histogram, Pareto chart, Box-and-Whisker plot
- Process Capability Analysis
- Control Charts: Run, Shewhart, ARL, OC, Cusum, MA, EWMA, X-MR, Regression, TSQ

Nonparametric Tests

- Independent samples: Kruskal-Wallis, Jonckheere-Terpstra, Fligner-Wolfe, two-sample Kolmogorov-Smirnov, Mann-Whitney tests, Dwass-Steel-Critchlow-Fligner and Conover-Inman pairwise comparison tests
- Related variables: Sign, Wilcoxon signed-rank, Friedman, Quade tests
- One-sample: Kolmogorov-Smirnov, Anderson-Darling, Wald-Wolfowitz runs tests
- Resampling: Bootstrap, without replacement, Jackknife

MANOVA

- Wide variety of designs
- Repeated measures analysis
- Means model for missing cells designs
- Within-group and between-group testing
- MANCOVA
- AIC, AICc, BIC computation
- Resampling: Bootstrap, without replacement, Jackknife

Factor Analysis

- Principal components, iterated principal axis, maximum likelihood
- Rotation: Varimax, quartimax, equimax, orthomax, oblimin
- Resampling: Bootstrap, without replacement, Jackknife

Confirmatory Factor Analysis

- Maximum likelihood, Generalized Least-Squares, and Weighted Least-Squares methods of estimation of parameters of the CFA model
- Goodness-of-Fit Index (GIF), Root Mean Square Residual (RMR), Parsimonious Goodness-of- Fit Index (PGFI), AIC, BIC, McDonald's Measure of Certainty, and Non-Normal Fit Index (NNFI) to

coded subgroup densities (box, dot, dit, jitter, stripe)
- Resampling: Bootstrap, without replacement, Jackknife

Test Item Analysis

- Classical analysis
- One- and two-parameter logistic model
- Quick Graph: Item plot

Multidimensional Scaling

- Two-way scaling: Kruskal, Guttman, Young
- Three-way scaling: INDSCAL
- Non-metric unfolding
- EM estimation
- Power scaling for ratio data
- Quick Graphs: MDS plot, Shepard diagram

Partially Ordered Scalogram Analysis with Coordinates (POSAC)

- Guttman-Shye algorithm; automatic serialization
- Quick Graph: Profile plot of coordinates
- Resampling: Bootstrap, without replacement, Jackknife

Perceptual Mapping

- MDPREF
- Preference mapping (vector, circle, ellipse)
- Procrustes and canonical rotations
- Quick Graph: Biplots

Conjoint Analysis

- Monotonic, linear, log and power
- Stress and tau loss functions
- Quick Graph: Utility function plot
- Resampling: Bootstrap, without replacement, Jackknife

Time Series

- Time series plot, ACF, PACF, CCF
- Transformed series: Mean, log, square, trend, difference, percent change, index, taper
- Smoothing: LOWESS, moving average, running median, and exponential
- Seasonal adjustment
- Box-Jenkins ARIMA model
- ARCH and GARCH models: BHHH, BFGS, and Newton-Raphson implementations, Forecasts for error variances using the parameter estimates, Jarque-Bera test for normality of errors, McLeod and Lagrange Multiplier tests for ARCH effect
- Trend Analysis: Mann-Kendall test and Sen slope estimator for non-seasonal data
- Trend Analysis: Seasonal Kendall and Homogeneity tests with Sen slope estimator
- Fourier and inverse Fourier transforms
- General options: Time axis format, interpolate or delete missing values, forecast

- Continuous: Triangular, double exponential (Laplace), Cauchy, Gumbel, Gompertz, Lognormal, Pareto, Rayleigh, inverse Gaussian, uniform, beta, normal, chi-square, Weibull, exponential, logistic, gamma, generalized lambda, half-normal, log-logistic, Erlang,smallest extreme value, studentized maximum modulus, non-central t, non-central chi-square, non-central F
- Multivariate distributions (random sampling): Multinomial, bivariate exponential, Dirichlet, multivariate normal, Wishart

Probability Calculator

- Computes probability density function, cumulative distribution function, inverse cumulative distribution function, and upper-tail probabilities for univariate discrete and continuous probability distributions
- Quick Graphs: Probability density function and the cumulative distribution function for continuous distributions

- Random sampling from univariate and multivariate distributions
- Fitting (univariate) distributions, Kolmogorov-Smirnov tests, Anderson-Darling tests, Function plots, Probability plots, Data transforms
  - Quick Graphs: Graphs of the respective observed and expected frequencies while fitting

Crosstabulation and Measures of Association

- One-, two-, and multiway tables
- Row and column frequencies, percents, expected values and deviates
- List layouts, list first *n* levels, display rows with zero counts
- Order categories, define intervals, include missing intervals
- Mode for one-way tables
- 2 x 2 tables: Likelihood ratio chi-square, Yates', Fisher's, odds ratio, Yule's Q and Y, relative risk
- r x r tables: McNemar's test, Cohen's kappa
- r x c tables, unordered levels: Phi, Cramer's V, contingency coefficient, Goodman-Kruskal's lambda, and uncertainty coefficients
- r x c tables ordered levels: Spearman's rho, Goodman-Kruskal's gamma, Kendall's tau-b, Stuart's tau-c, Somers' D
- Others: Mantel-Haenszel test, Cochran test
- Row-dependent and symmetric statistics
- Table of counts and percents
- Cell statistics
- Association measures for one-and two-way tables along with confidence intervals
- Standardized tables
- Resampling: Bootstrap, without replacement, Jackknife

Correlations, Distances and Similarities

- Continuous data: Pearson correlations, covariance, SSCP
- Distance measures: Euclidean,
- Prediction for new observations
- Stepwise regression: automatic, and interactive stepping, partial correlations
- AIC, AICc, BIC computation
- Hypothesis testing, mixture models
- Automatic outlier and influential point detection
- Quick Graph: residuals vs. predicted values; fitted model plot in the case of one or two predictors (confidence and prediction intervals in the case of one predictor)
- Resampling: Bootstrap, without replacement, Jackknife
- Bootstrapped estimates by bootstrapping cases or residuals, bias and confidence intervals

Best subsets

- Find the best models given the number of predictors
- Best model by R^2, Adjusted R^2, Mallow's C_p, MSE, AIC, AICc and BIC
- Complete regression analysis using the best model

Polynomial

- Single independent variable up to order 8
- Natural and orthogonal methods
- Goodness-of fit-statistics (R^2 and adjusted R^2) and ANOVA with *p*-values for all models, starting from the order specified by the user, down to linear
- Quick Graphs: Confidence and prediction interval plots along with estimates, and a plot of residuals versus predicted values

Bayesian

- Prior distribution: diffuse or (multivariate) normal-gamma distribution
- Bayes estimates and credible intervals for regression coefficients computed
- Parameters of the posterior distribution provided
- Plots of prior and posterior densities of regression coefficients

Ridge

- Two types of ridge coefficients: standardized and unstandardized coefficients
- Quick Graph: A plot of the ridge factor against the ridge coefficients

Partial Least-Squares Regression

- NIPALS algorithm
- SIMPLS algorithm
- Crossvalidation
- Standard errors

Robust Regression

- Least Median of Squares (LMS) regression
- Rank Regression
- Least Trimmed Squares (LTS) regression
- M regression
- Scaled regression
- Least Absolute Deviation (LAD) regression

Logistic Regression

- Binary, multinomial, discrete choice and conditional through separate simplified interfaces and input data formats
- Specify the reference level for
- Variance components
- Diagonal
- Compound symmetry
- Unstructured
- Structures for error matrix:
  - Variance components
  - Compound symmetry
- AIC, AICc, BIC computation

Mixed Regression

- Hierarchical Linear Models (HLM)
- Specify effects as fixed or random
- Autocorrelated error structures
- Nested Models (2-Level): Repeated measures, Clustered data
- Unbalanced or balanced data
- Quick Graph: Scatterplot, histogram or scatterplot matrix of empirical Bayes estimates

Hypothesis Testing

- Mean: One-Sample z-test, Two-sample z-test, One-Sample t-test, Two-Sample t-test, Paired t-test, Poisson test with Bonferroni, Dunn-Sidak adjustments
- Variance: Single Variance, Equality of Two Variances, Equality of Several Variances
- Correlation: Zero Correlation, Specific Correlation, Equality of Two Correlations
- Proportion: Single Proportion, Equality of Two Proportions
- Input data related to different samples laid out using an indexed variable or in different columns
- Appropriate Quick Graphs
- Resampling: Bootstrap, without replacement, Jackknife
- Bootstrap-based *p*-values for all tests for mean and variance
- One- and two-sample Hotelling T^2 test for mean vector of multivariate data

ANOVA

- One-way ANOVA: Multiple comparison tests, Bonferroni, Tukey-Kramer HSD, Scheffé, Fisher's LSD, Tukey's b, Student-Newman-Keuls, Duncan, R-E-G-W-Q, Hochberg's GT2, Gabriel, Tamhane T2, Games-Howell, Dunnett's T3, Sidak
- Two-way ANOVA: Post hoc tests on least- squares means (Bonferroni, Tukey, LSD, Scheffé)
- Repeated measures: One-way, two or more factors
- ANCOVA
- AIC, AICc, BIC computation
- Automatic outlier and influential point detection
- Quick Graph: least-squares means
- Resampling: Bootstrap, without replacement, Jackknife
- Type I , II and III sums of squares
- Confidence intervals and hypothesis tests for Helmert, reverse Helmert, deviation and simple contrasts
- Options to test normality and homoscedasticity assumptions, including Levene's test based on mean or median

General Linear Model

- Any general linear model $Y = X\beta + \varepsilon$
- Any general linear hypothesis $A\beta C' = D$
- Repeated measures: One-way, two measure the degree of conformity of the postulated factor model to the data

Discriminant Analysis

- Classical Discriminant Analysis (Linear and quadratic)
  - Prior probabilities, contrasts
  - Output: F statistics, F matrix, eigenvalues, canonical correlations, canonical scores, classification matrix, Wilks' lambda, Lawley-Hotelling, Pillai and Wilks' trace, classification tables, including jackknifed, canonical variables, covariance and correlation matrix, posterior probabilities and Mahalanobis distances
  - Stepwise modeling: Automatic, forward, backward and interactive stepping
  - Resampling: Bootstrap, without replacement, Jackknife
- Robust Discriminant Analysis (linear and quadratic)
  - Useful when the data sets are suspected to contain outliers
  - Save robust Mahalanobis distance, weights, and predicted group membership

Cluster Analysis

Hierarchical

- Distance measures: Euclidean, percent, gamma, Pearson, R^2, Minkowski, chi-square, phi-square, absolute, Anderberg, Jaccard, Mahalanobis, RT, Russel, SS
- Linkage methods: Single, complete, centroid, average, median, Ward, flexible beta, k-neighborhood, uniform, weighted
- Five indices for cluster validity: RMSTTD, Dunn, Davies-Bouldin, Pseudo F, Pseudo T^2
- Cutting cluster tree based on specified nodes and tree height
- Quick Graphs: Dendrogram, matrix and polar
- Resampling: Bootstrap, without replacement, Jackknife

K-means and K-medians

- Distance measures: Euclidean, MWSS, gamma, Pearson, R^2, Minkowski, chi-square, phi-square, absolute, Mahalanobis
- Quick Graphs: Parallel coordinate and mean/standard deviation profile plots

Additive trees

- Input: Similarity, dissimilarity matrices
- Quick Graph: Dendrogram

Correspondence Analysis

- Simple and multiple (raw data and data in tabular form)
- Quick Graphs: Vector and casewise plots
- Resampling: Bootstrap, without replacement, Jackknife

Classification and Regression Trees

- Loss functions: Least-squares, trimmed mean, LAD, phi coefficient, Gini index, twoing
- Quick Graph: Unique tree mobile including split statistics and color

Spatial Statistics

- 2D & 3D variogram, Kriging and simulation
- Variogram types: Semi, covariance, correlogram, general relative, pairwise relative, log, madogram
- Semivariogram models: Spherical, exponential, Gaussian, power and hole effect
- Kriging types: Simple, ordinary, non-stationary and drift
- Quick Graphs: Variogram and contour plot
- Resampling: Bootstrap, without replacement, Jackknife

Signal Detection Analysis

- Models: Normal, nonparametric, logistic, exponential, chi-square, Poisson, gamma
- Quick Graph: Receiver operating characteristic curve

Survival Analysis

- Kaplan-Meier, Nelson-Aalen and actuarial life tables with confidence intervals
- Turnbull KM estimation (EM)
- Cumulative hazards and log cumulative hazards
- Cox regression, parametric models: Exponential, accelerated exponential, Weibull, accelerated Weibull, lognormal, log-logistic
- Type I, II and III censoring
- Stratification, time dependent covariates
- Forward, backward, automatic and interactive stepwise regression
- AIC, AICc, BIC computation
- Quick Graphs: Survival function, Cox-Snell residual plot, quantile, reliability, and hazard plots

Path Analysis (RAMONA)

- Analyze covariance or correlation matrices
- MWL (maximum Wishart likelihood)
- GLS (generalized least-squares)
- OLS (ordinary least-squares)
- ADFG (asymptotically distribution free estimate biased, Gramian)
- ADFU (unbiased)

Design of experiments

- Choice of Classic and Wizard interfaces
- Optimal designs
- Complete and incomplete factorial designs
- Latin square designs, 3 to 12 levels per factor
- Box and Hunter 2-level incomplete designs
- Taguchi designs
- Plackett and Burman designs
- Mixture: Lattice, centroid, axial, screening
- Response surface designs: Box-Behnken and central composite designs

Response Surface Methods

- Fit a second degree polynomial to one or more responses on several factors
- Regression coefficients, analysis of variance, tests of significance

- Optimum factor settings using canonical (for each response) or desirability (for all responses jointly) analysis,
- Quick Graph: Desirability plots
- Contour and surface plots with fixed settings for one or more factors

Power Analysis

- Determine sample size to achieve a specified power
- Determine power for a single sample size or a range of sample sizes
- Proportions, correlations, t-tests, z-tests, ANOVA (one- and two-way), generic designs
- Conforms to the hypothesis tests on means and their various options
- One- and two-sided alternatives
- Quick Graph: Power curve

GRAPHICS

General

- Use Microsoft's 16M color palette
- Flicker-free rendering of graphs in the Graph Editor
- Overlay an unlimited number of graphs
- Automatically plot and color subgroups side-by-side or overlaid
- Specify colors in terms of their Red-Green-Blue component values
- 45 built-in colors
- Overlaid graphs, pie charts, and stacked bar charts colored in such a way as to provide more contrast between adjacent elements
- Graph Gallery with a variety of graph templates
- Interactive changing of Graph properties with support for 'Begin-End' and Quick Graphs
- **Dynamic Explorer**
  - Experience better dynamic control of orientation of 3D graphs with automatic rotation, step-by-step rotation or rotation using the mouse
  - Zoom graphs (in the direction of each axis or all together)
- Advanced page view that lets you position & resize the graphs, titles & other annotation objects before printing
- **Graph toolbar**
  - Selection tools for selecting a subset of plot points
  - Zoom in & Zoom out feature with selection zooming or step zooming tools
  - Pan tool for moving (drag-and-drop) the graph within the Graph Editor
  - Realign multiple frames to default layout with a single click of the mouse
- **Annotation tools**
  - Objects like Rectangle, Circle, Ellipse, Polyline, Arrow etc. can be added to the graph interactively
  - Dot densities: Dit, symmetric dit (dot), jitter, fuzzy and stripe
- **2-D/3-D displays**
  - Histogram: Counts, cumulative counts, control number of bars or bars widths
  - Normal and kernel density functions
  - Contour and mosaic plots
  - Pseudo 3-D displays, mirror plots

Scatterplots, Quantile and Probability plots

- Repeated measures, contour and tiled plots
- Smoothers (2-D/3-D): Linear, quadratic, DWLS, step, NEXPO, inverse, Andrews, bisquare, Huber and Kriging
- Smoother residuals
- Option for limiting smoother to data range
- Line connecting plot points, minimum spanning tree, traveling salesman path, Voronoi tessellation, Delaunay triangulation, vectors, spikes and convex hull
- Size points by influence, sunflower symbols
- Border 2-D graph for plots

Other 2-D plot and SPLOM options

- Hexagonal binning with desired number of cuts
- 38 theoretical densities for probability plots
- Smoothers: Log, power, lowess, spline, mean, median, mode, midrange, trimmed mean
- Confidence interval contours: Bivariate ellipsoid, bivariate centroid, regression line, kernel density
- Display univariate densities on borders: Histogram, box, box/dot, dot, dit, frequency polygon, normal, kernel, fuzzy, stripe, jitter
- High-low-close plots (2-D)
- Mirror plots (2-D)

Maps

- Present statistical data on maps
- US: States, counties, metro areas, census tracts, and related demographics
- World: Continents, nations, West European provinces
- Eleven geographic projections
- Create map (shape) files

Additional graphs

- Multiplots based on Trellis plots, multiple displays based on grouping variables for summary charts and plots
- Icon plots: Chernoff faces, Fourier blobs, histograms, profiles, thermometers, weather vanes, stars and arrows
- Parallel coordinate and Andrews' Fourier plots
- Function plots: Specify any 2-, 3- or 4-D function

file; copy-paste all or some properties of any number of variables
- Windows XP-style grids in the Data/Variable Editor and dialog boxes
- View value labels or data values in the Data Editor
- View variable statistics and histogram for any variable on right-click
- Window menu to view multiple tabs in the Viewspace simultaneously
- Quick Access menu containing all commonly used graphical and statistical tools
- Examples tab with one-click access to all the examples in the user manual
- Add your own examples to the Examples tab
- Extensive use of drag-and-drop and right-click mouse functionality
- Faster processing speed
- Fully customizable main and context (right-click) menus; set captions, accelerator keys and button images
- Simple and intuitive default menu structure
- Advanced customizable Status Bar with items to toggle global settings, data processing conditions, and states of the Insert, Caps Lock, Num Lock and Scroll Lock keys on the keyboard
- Record and play menu and dialog actions; create new menu items with links to these
- Create your own menu items linked to command files or sets of commands
- Token dialog boxes to display informational messages, to specify text, numbers and filenames, to choose variables, filenames and variable lists, to make choices that are mapped to underlying command files
- Several toolbars with over 250 fully customizable tools (buttons) including Format Bar, Graph Editing toolbar and Data Edit Bar embedded in the Output, Graph and Data Editors respectively
- View toolbars using the View menu
- Specify/modify keyboard shortcuts
- Set menu font and animation
- Create new popup menus in the Menu Bar
- Create and apply interface themes that capture the menu structure and content, status bar content, keyboard shortcuts, output scheme, pane dimensions & locations, toolbar positions and content, recent files, and user menu items
- Use themes supplied with the product and download additional themes from the Internet through a dialog box interface that lets you choose the themes to download
- Numerous global options for each aspect of the application

- Input an unlimited number of variables and cases limited only by working system memory
- Field width of up to 23 with up to 14 decimal places for numeric data, up to 256 characters for string data
- Default variable format, distinct from numeric output format, for newly created variables in the Data Editor
- Sort or transpose data; merge or append files
- Label and order categories
- Manage missing values
- Rank, center, standardize and trim variables
- Save data sets to temporary files that are automatically deleted on exit
- Compute new variables/transform variables using arithmetic operators, relational operators, logical operators, IF…THEN transformations, trigonometric, exponential, logarithmic, multivariate, character, date and time functions
- Select cases based on a specified condition and invert case selection
- Save only selected cases or specified variables
- Recode variables instantly and conveniently; option to replace or create variables with recoded values
- Global option to trim leading and trailing spaces in string variable data
- Matrix computations through the dialog as well as command line interface, available for use in conjunction with other statistical features
- Use BASIC control structure to manipulate data: read, select, sort, transform, print, save, create random samples, and so on
- Create temporary variables and arrays
- Use Mersenne-Twister or Wichman-Hill random number generator while generating random samples

Command editor

- Auto-completion and automatic coloring of commands, command arguments, options and option values
- Open multiple command files
- Save command files in ANSI or Unicode formats with a global option to specify the default
- Obtain help for any phrase simply by typing it and using the context menu

Command Language

- Complete coverage of menu functionality
- Interactive command entry speeds analysis
- Command files to automate repetitive tasks

Output Organizer ™

- Index for easy output navigation and manipulation
- Combined, formatted statistical output and graphs
- Right-click on any data file node to set it active for editing or using in an analysis
- Organize output based on the data file used for a given section of the output
- Set detailed output organizer node captions and specify custom node captions

Help

- Extensive printed/pdf user documentation containing 8 volume set of SYSTAT manuals: Getting Started, Statistics I, Statistics II, Statistics III, Statistics IV, Graphics, Data, Language Reference
- Extensive Online Help System with Index, Search, Favorites lists
- Acronym expansions, data file references in the Online Help system
- Knowledge base (FAQ) with answers to various queries raised by users
- Tutorials with step-by-step instructions on using various features
- Quick reference of commands, and list of new and modified commands
- Status bar help and 'Bubble Help' regarding a given feature on mouse hover on the corresponding menu item
- Statistics Glossary
- Context sensitive help on pressing F1 on any item in the interface

- Objects can be selected, repositioned and resized quite easily
- Properties like Line Color, Style, Thickness and Fill Color, Pattern etc. can be set and modified easily
- Text can be added interactively to attach meaningful contents to graph elements which need extra attention
- Text font properties can be set and modified conveniently

■ **Status bar help**

- Tooltips showing individual element name (for e.g. Frame, X-axis, Legend, Bar, Scatterplot, Histogram, etc.) in the status bar on mouse hover in the Graph Editor
- View properties of elements like case ID and the value against variable names for all the axes

■ Save charts to BMP, PS, EPS, EMF, WMF, JPG, PICT, GIF, TIFF, PNG with options for setting, resolution, size, format and color translation
■ Frame tracker for identifying individual frames that can be resized and/or repositioned
■ Object tracker for identifying individual objects in a graph that can then be edited using the Graph Interactivity feature
■ Reposition the graph title using the mouse (drag-and-drop)

Global Options

■ Decorate your graphs with different background & border themes.
■ Threshold limit and grid cuts for automatic hexagonal binning
■ Location, facet, eye (3-D rotation angle), scale and appearance settings for all graphs through the dialog as well as command line interface
■ Ability to change the image type of the graphs appearing in the output, like PNG, BMP, JPEG, GIF or EMF

Bar, dot, line, pie, profile and pyramid charts (Summary Charts)

■ Use medians instead of mean for Bar, Dot, Line, Profile and Pyramid graphs
■ Bar: 2-D, 3-D, stacked, error bars, repeated measures, percent, polar, mirror, mosaic
■ Dot: 2-D, 3-D, line connected, error bars, repeated measures, percent, polar, mirror
■ Line: 2-D, 3-D, errors, repeated measures, percent, mirror
■ Pie: 2-D, 3-D, concentric rings, offset slice
■ Profile: 2-D, 3-D, stacked, repeated measures, percent, mirror
■ Pyramid: 2-D, 3-D, repeated measures, percent, mirror
■ Base line (Anchor) is drawn at the specified base value for bar and pyramid charts
■ Distinct stack and percentage options for univariate bar charts
■ Stacked grouped bar charts

Histograms, box and density plots

■ **2-D displays**

- Box plot: Box and whisker, notched, Box with dot

Coordinates and Projection

■ Rectangular, polar, triangular and spherical coordinates
■ Geographic projections: Gnomonic, stereographic, Mercator, orthographic, Lambert, Robinson, sinusoidal, Miller, Peters,fish-eye

Interactive graphics

■ Single dialog box with context sensitive tabs for editing individual components of the graph: Graph, Frame, Axis, Legend and Element. The changes get reflected instantly.

■ **Graph and Frame**

- Change background color, title, font, coordinates and projections
- Zoom/resize, rotate and reposition graphs/frames
- Change the row-column matrix dimension of graph frames in multiple graphs
- Change summary charts like bar, dot, line, profile and pyramid from one type to another
- Change related density types from one type to another

■ **Axes**

- Control axis title, font for title and tick labels, number of ticks and number of pips
- Modify line aesthetics like color, style, and thickness
- Set limit lines and grid lines
- Modify minimum and maximum scale for an axis
- Transform the scale to the log or power scale

■ **Element**

- Modify element aesthetics like line color, style, thickness, fill color, pattern, symbol, type, size and boundary
- Change error bar settings, height parameter, base line, bar width and label settings for summary charts
- Separate a slice, change to an attention map (ring), display slice labels, and transform the scale in pie charts
- Change smoothers, residuals, connectors, partitions, specify vector lines, vertical spikes, confidence contours and hexagonal binning for scatterplots
- Set the surface type, gradient and wireframe for 3-D scatterplots and function plots

■ **Legend**

- Modify legend titles, location, layout (number of rows and columns) and labels

GENERAL FEATURES

Graphical User Interface

■ The Graphical User Interface is a single window with panes and tabs for displaying output, data, graph and command files conveniently
■ Auto-hide Workspace and Commandspace
■ Startpage to access what's new in the current version, recent files, interface themes and manuals, get useful tips, and scribble notes
■ Variable Editor for editing various properties of variables in the data
■ Store and retrieve current settings for several options including active data file, value label display format, and variable label display format
■ Move the active tab to the beginning of the Viewspace/Commandspace
■ Specify file comments in the Data Editor
■ Command line and dialog interface interlinked so that the hypotheses features can be conveniently accessed
■ Crash recovery and rescue system, to retrieve any unsaved data, command, and output files, in the unlikely event of a crash or improper shut down

■ **Dialog boxes**

- Tabbed dialog boxes, with tabs arranged vertically, where various sets of options come under various tabs of the main dialog box
- Drag-and-drop, double-click, multiple contiguous and non-contiguous selection using Shift and Ctrl keys, context menu to ease the selection of variables in different dialog boxes
- All the input fields in dialogs show tool tips indicating range values
- Icons to indicate Category variables in dialog boxes and Data Editor, and frequency as well as weight variables in the Data Editor
- Variable labels as tooltip on mouse hover
- Keyboard shortcuts for dialog items
- Grid controls for entering any number of rows of input, with keyboard shortcuts
- 'What's this' help for each item in the dialog box

Data Management

■ Data file format with compression
■ Import/export data formats like Statview, Stata, Statistica, JMP, Minitab, S-Plus, ASCII, Microsoft Excel™, SAS®, SPSS®, ODBC, dBASE® and ArcView® file formats
■ Import Business Objects
■ Use numeric, string or data-time variables
■ Specify date as well as time formats simultaneously for any given variable
■ Store variable labels, comments, width and format, value labels, file comments as well as category, frequency, weight and ID variable information to the data file
■ Global options to turn off saving category and ID variable information to the data file
■ View multiple data files, activate any given data file from among the open data files for editing and/or analysis, and save view-mode data files
■ Close data files that are no longer needed in a given session
■ Paste data as text, paste variable properties, paste data with custom row and column separators, copy variables to the clipboard and insert them anywhere in the Data Editor
■ Drag-and-drop data from editors that support dragging of content, including the Commandspace, into the Data Editor
■ Command log records session history
■ Streamlined command syntax with informative error and warning messages wherever applicable
■ Create command templates with token variables
■ Define and call macros in your command scripts
■ Globally available Basic Statistics, BASIC and Matrix commands
■ Insert comments at the end of a command line
■ Translate legacy command files
■ Open legacy command files for direct execution in the current version

Output

■ Headers, footers, page setup and print preview with multiple view options
■ HTML based output with tabular and ASCII modes; tables can be directly and conveniently copied to external applications without distortion
■ Collapsible links for each section of the output

■ **Global options**

- Specify the field width, number of decimal places, locale and digit grouping for numeric output
- Short, medium or long statistical output
- Define font style and size for tabular as well as ASCII output formats; font sizes can be condensed to be as small as desired
- Display variable labels, names or both
- Display value labels, data values or both
- Wrap and/or truncate text in tables appearing in the output, at the desired number of characters
- Control the display of statistical Quick Graphs
- Control echoing of commands in the output

■ **Page width: Narrow, Wide or None (Infinite page width)**

- Maximum number of characters in a row and number of columns in tables dynamically determined based on the page width and font settings
- Tables with excess columns will be split into as many parts as required with the row and column headers appended to each part

■ Global output scheme options for each component of the output; settings saved to the interface theme
■ Save output in the SYSTAT (.syo), text, RTF, HTML or single-page HTML (.mht) formats
■ Output can be resumed from previous sessions using the SYSTAT format output file, which contains the command log and data file information

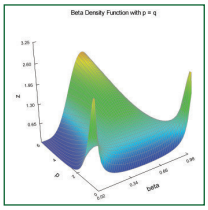
**Please Note:
Items in red are new features in SYSTAT 13.2

SYSTEM REQUIREMENTS

Minimum hardware and software requirements for SYSTAT are:

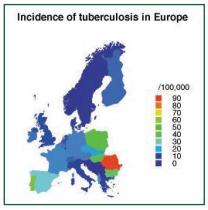
■ Windows 7 or Windows 8 or Windows 10
■ 2 GHz 32-bit (x86) or 64-bit (x64) Processor
■ 2 GB of System Memory for 32-bit (x86)
■ 4 GB of System Memory for 64-bit (x64)
■ 600 MB of Available Hard Disk Space
■ CD-ROM Drive or Internet Connection
■ 800x600 SVGA/256 color display or better
■ Internet Explorer Version 9 or better

SYSTAT Supports All Types of Scientific and Technical Research



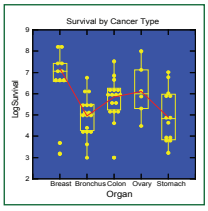
Statistics: Theoretical Distributions

SYSTAT offers density, cumulative, inverse and random number functions for 28 distributions, fitting of 25 distributions and random sampling of 33 distributions.



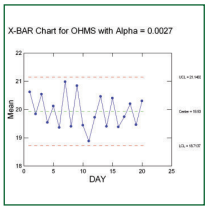
Epidemiology: Tuberculosis incidence

SYSTAT lets you combine geographic and statistical data to create insightful maps, such as this plot highlighting tuberculosis incidence rates across Europe.



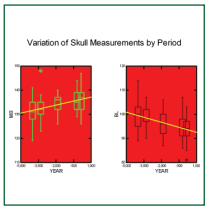
Medical Research: Clinical Trials

Box plot of selected cancer types was used in part to investigate the effects of supplemental Vitamin C as part of routine cancer treatment. Potential analyses include descriptive statistics, transformations, ANOVA, and survival analysis.



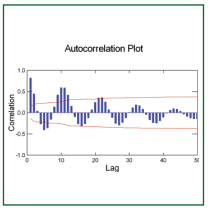
Manufacturing: Quality Improvement

This X-bar QuickGraph shows the average resistance of five random computer components measured over twenty production days.



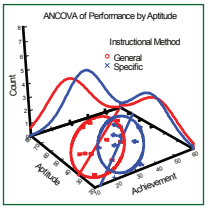
Archeology: Evolution of skull dimensions

SYSTAT's MANOVA and ANOVA procedures found significant variation between time periods in these measurements of male Egyptian skulls, depicted here in combined regression / box plots.



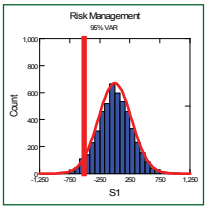
Astronomy: Sunspot Cycles

Use QuickGraphs to glance at your data before doing in-depth research, such as this auto-correlation chart showing the cyclical patters displayed by sunspots.



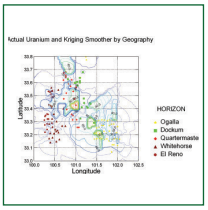
Psychology: Instructional Method and Learning

SYSTAT's Analysis of Covariance (ANCOVA) helped adjust for the effect of basic aptitude in this experiment comparing two different instructional methods.



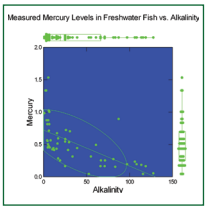
Banking and Finance: risk management

This histogram of stock portfolio prices was created using SYSTAT's powerful Monte Carlo module to simulate a 5000 case sample size.



Geology: Uranium Reserves from Groundwater

SYSTAT's spatial statistics Kriging estimator produces a contour overlaid with actual uranium levels to indicate geological concentrations.



Environmental Science: Mercury Levels in Freshwater Fish

Regression is used here to compare the standard mercury level found in fish versus the Alkalinity of their lake. The box plots on the border of the graph show the distribution of the data, which can be used to identify outliers. Other possible analyses include descriptive statistics, transformations, and correlations.

"I really enjoy SYSTAT 13.2's new tabbed layout, and the descriptive text pop-ups makes teaching statistics easier."

- Professor Roy Plotnick, University of Illinois at Chicago

"The SYSTAT data editor snaps large data files right into place, and it imports everything. I have no problem reading SAS, SPSS, Excel or any other files, and the straight forward scripting language allows me to write easy macros for importing and organizing raw, unformatted data. Dollar for dollar, you can't buy anything else and get what you get with SYSTAT. You get everything!"

--Dr. Robert Hess, Professor Emeritus, Arizona State University

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