

Paper 198-28***Introduction to JMP[®]***

Thomas A. Little, Ph.D.

SAS Products: JMP Version 5.0
Operating Systems: MS Windows and OS10
Skill Level: Beginner – Advanced

Abstract:

This hands-on-workshop begins with basic data and table manipulation, demonstrate JMP's analysis capabilities and move to the advanced features. Topics covered in the workshop include Design of Experiments, statistical process control, outlier detection, residuals analysis, journal features, variability graphs, variance components, REML, measurement systems analysis, general statistical comparisons, scripting capabilities and regression modeling.

The course will allow users the ability to use computers, data sets and work through the examples along with the instructor. At the conclusion of the workshop the participant should be able to understand the purpose and application of JMP as an analytical engine for routine data analysis and model building. Emphasis will be placed on JMP's analytical tool box, speed of data analysis using JMP and ease of use.

Introduction to JMP

JMP is a powerful, user friendly desktop application which excels in three primary areas; 1) analytical power, 2) speed of execution and 3) ease of use. JMP offers a wide array of analytical techniques from multifactor modeling to simple control charts and regression modeling. It also has excellent table manipulation and data handling routines to manipulate large datasets into their proper format ready for analysis. Because JMP allows for simultaneous definition of graphs, many analyses can be generated from the data which speeds up analysis activities. JMP uses a “define once and view many” interface rather than the traditional “define once, view once” approach. The visual interface is mouse based, point and click and the menus are intuitive and similar in many respects to Microsoft and Mac command conventions.

Statistical Foundations

JMP offers a wide array of statistical information in integrated graphs and tables. User preferences can be set to customize each analytical platform to show the analytical features and graphical features of greatest value to the user. Features that are not available in JMP can be created by the user using JMP's unique scripting language.

The purpose of the statistical foundations section of the workshop is to explore JMP's capability for doing basic and advanced statistical summaries from tabled datasets.

Analysis In Line with Data Coding

JMP codes variables as Nominal, Continuous and Ordinal. Based on the column coding, and the analysis selected, JMP will launch the appropriate analysis platform for the X and Y columns of interest. Single variable studies are simply completed using the Distribution platform. Distribution analysis may include tests of the mean and standard deviation to a reference target, confidence intervals, tolerance intervals and distribution fitting routines. JMP supports most traditional and advanced analytical methods for nominal X and continuous Y analysis; such as, t test, One-way ANOVA, N-way ANOVA, and tests for variances.

When both the X and Y variables are coded as continuous, JMP's Fit Y by X platform and Fit Model platforms are available. Traditional and advanced fitting methods are available for users to fit data and make appropriate predictions from the fitted models. Simple linear, polynomial and special fitting functions are available and easy to use.

JMP also supports wide variety of categorical data analysis, multivariate and logistical regression modeling tools.

Design of Experiments

JMP has a very useful and advanced DOE toolbox and custom design engine. The DOE platform supports traditional catalogue designs as well as a very flexible and powerful custom design engine to create user unique experimental structures. JMP uses the proven coordinate exchange method for creation of custom experiments. The user can select I-Optimal or D-Optimal designs depending on the desire to maximize the accuracy of the coefficients or maximize the accuracy of prediction over the range of the experiment. JMP allows for the generation of experiments with constants, covariates, multiple level categorical factors, complex blocking, multiple levels of continuous factors and mixture factors all in the same experimental structure. JMP also supports supersaturated design structures (Bayesian D-Optimal designs) that allow greater flexibility in controlling the number of runs and the degree of confounding in the design.

JMP provides the user the ability to augment a completed experiment. This feature allows the user the ability to design an experiment and later add additional runs to explore interactions and response curvature. JMP has proven capabilities in DOE and linked to the Fit Model platform; JMP can design appropriate experiments and easily find optimal regions of performance.

Contact Information

For additional information, contact the author at:

Thomas A. Little
Thomas A. Little Consulting
email: drlittle@dr-tom.com
www.dr-tom.com