



SAS/INSIGHT Software

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Introduction

This chapter describes the changes and enhancements to SAS/INSIGHT software that were implemented in the Version 7 release. There were no additional changes or enhancements in Version 8. New features in Version 7 include new statistical analyses and enhancements to the graphics.

SAS/INSIGHT software now supports several multivariate statistical techniques, including principal component rotation analysis, canonical correlation analysis, maximum redundancy analysis, and canonical discriminant analysis. It also supports comparison of means. There are also new robust measures of scale and tests for normality for univariate data, as well as tests for differences of means across groups.

New graphical enhancements include surface plots, contour plots, response surfaces, comparison of means circles in the box plots, and color blending of up to five colors. Several methods for surface fitting are provided, including linear interpolation, thin-plate spline, kernel estimation, and using a parametric model.

Box Plots

The box plot now includes an option to test for differences of means between groups, and also to construct simultaneous confidence intervals for these differences. The multiple comparison tests that are available in SAS/INSIGHT software are

- the Pairwise *t*-test
- the Pairwise *t*-test
- the Pairwise Bonferroni method
- Dunnett's Test with Control
- Hsu's Test for Best
- Hsu's Test for Worst.

In addition to a table summarizing the statistics for simultaneous multiple comparison of means, SAS/INSIGHT software provides a graphical technique to help visualize which groups are significantly different from a selected group. Each test is accompanied by a comparison circles plot that graphically illustrates the comparisons.

Scatter Plot

The brushes in a scatter plot have two brushing modes, uniform and fisheye. A pop-up menu that is associated with the brush allows you to select brushing modes. You can hold down the right mouse button inside a brush to bring up its pop-up menu and make a selection.

Contour Plot

A *contour plot* is a graphical representation of the relationship between a response variable (Z) and two explanatory variables (X and Y). The contours (or *level sets*) of a response variable are plotted in the plane of the explanatory variables. The contour levels are plotted either as curves or as filled areas.

You can interactively identify, label, color, and move contour levels, and you can change the resolutions of a rectangular grid to get better computational quality and performance. You can choose linear interpolation or thin-plate smoothing spline to fit contour surface functions.

You can also toggle, identify, and label observations in the contour plot, control the orientation of the plot, and control the information shown on the axes.

Rotating Plot

You can now fit either a piecewise-linear surface or a thin-plate smoothing spline to a cloud of three-dimensional data. The surface may be color-coded and color-blended. The color that you place on the surface may represent a fourth variable, thus allowing you to visualize the level sets of a fourth variable as contours along the Z direction in 3-dimensional space. You can also interactively change the resolutions of the rectangular grid for the surface in order to get better quality or performance.

Distribution Analyses

There are several new univariate statistics in SAS/INSIGHT software. These are

- basic confidence intervals of mean, standard deviation, and variance
- robust measures of scale
- tests for normality.

Fit Analyses

When there are two explanatory variables in the model, a parametric response surface plot is created by default. You can also generate a nonparametric kernel or thin-plate smoothing spline response surface plot.

With more than two explanatory variables in the model, a parametric profile of response surface plot with the first two explanatory variables can be created. The values of the remaining explanatory variables are set to their corresponding means in the plot. You can use sliders to change the values of the remaining explanatory variables.

Multivariate Analyses

When performing pairwise correlations, SAS/INSIGHT software drops an observation that has a missing value for any variable used in the analysis from all calculations.

You can display *biplots*: a joint display of two sets of variables in which the data points are displayed in a scatter plot of principal components.

There are several new or enhanced multivariate analyses:

- principal component analysis
- canonical correlation analyses
- maximum redundancy analysis
- canonical discriminant analysis.

For More Information

For detailed information about any of these changes or enhancements, see *SAS/INSIGHT User's Guide*.

