

Using PC SAS/ASSIST* for Statistical Analyses

Margaret A. Nemeth, Monsanto Company

Introduction

SAS/ASSIST, a user friendly, menu driven applications system, is available on several platforms. This paper discusses SAS/ASSIST, Version 6.04, on the PC platform.

On first entering SAS/ASSIST the Primary Menu is displayed. The menu consists of the following items:

1. Tutorial
2. Data
3. Reports
4. Graphics
5. Statistics
6. Desktop
7. Programs
8. Applications
9. Setup
10. Procedures
11. Exit.

The discussion concentrates on the Graphics, Statistics, Programs, Applications, and Procedures menu items.

Graphics

The Graphics Menu consists of the following items: Help, Data, Bars, Pie, Plot, Slides, Go Back.

Data allows you to specify and/or create data sets for analysis. Bars generates bar charts (regular and stacked), both vertical and horizontal and Pie generates a Pie chart. Plot generates two-dimensional plots, both connected and unconnected, for two quantitative variables. All plots can be customized. Figure 1 shows a copy of the screen resulting from implementation of the Plot menu item. You are first asked to

Command ==>

Please select a variable to plot on the horizontal axis.
HELP RUN VIEWPGM SAVEPGM CUSTOMIZE GOBACK

ACTIVE data set: SASUSER.CLASS

GRAPHICS device: IBM PS/2 EGA: EGA MONITOR

OUTPUT destination: DEFAULT FOR GRAPHICS DEVICE

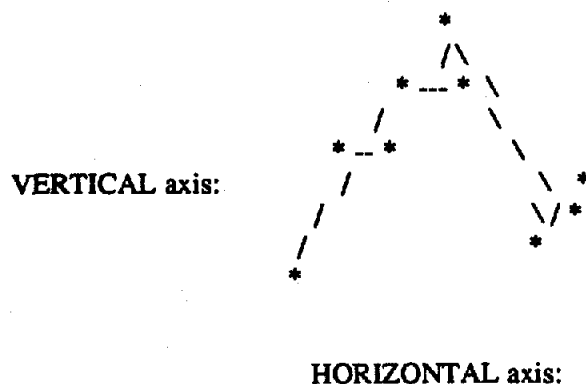


Figure 1

identify the variable for the horizontal axis. All appropriate variables are listed and you need only choose one. Then you are prompted for the variable for the vertical axis. Again all variables are listed and you need only choose one. When the RUN command is selected SAS/ASSIST writes the program statements and executes them. You have the option to view the program and, if you wish, to save the program for use at a later date.

Statistics

The Statistics Menu consists of the following items: Help, Data, Summary, C.I., Correlation, Regression, ANOVA, and Go Back.

The Summary option is used to calculate the following descriptive statistics: n (number of nonmissing observations), nmiss (number of missing values), max, min, mean, variance, standard deviation, standard error of the mean, range, sum, and coefficient of variation.

The C.I. option calculates confidence intervals for the mean for confidence coefficients between 0.01 and 0.99. The default value is 0.95.

The Correlation option computes correlation coefficients for quantitative variables. Three methods are available: Pearson product-moment correlation (the default), Kendall's tau-b coefficients, and Spearman rank coefficients.

The Regression option performs simple and multiple linear regression. Scatter plots can be generated along with an analysis (Cook's d statistic) and plots of the residuals. The residuals are plotted versus both the predicted values and the independent variable(s).

The ANOVA option performs one-way and two-way analyses of variance. Since PROC GLM is implemented in this option unbalanced data can be analyzed. However, least squares means are not available as a post-test option. The post-tests available are: Bonferroni t-tests, Duncan's multiple range test, Ryan-Einot-Gabriel-Welsh multiple F-test, Scheffe's multiple comparison procedure, Student-Newman-Keuls multiple range test, Pairwise t-tests, and Tukey's studentized range test. All of these procedures issue a warning that the cell sizes are not equal in the unbalanced two-way case and use the harmonic mean of the cell sizes to perform the tests.

Programs

This option allows you to view, edit, run, and delete previously saved programs. Additional programs can also be added to the list. Figure 2 shows a typical screen.

Command ==>

HELP ADD FORWARD BACKWARD GOBACK

Select program below. You can edit, execute, or delete your programs.

E - edit, R - run, M - modify description, D - delete, U - undelete

SEL	Program Description	File Name	Created
_	Simple Scatter Plot	c:\sasuser\plot.exp	25JUN91
_	Regression Model	m:\sas\miller.sas	07JUN91
_	Example Using GMAP	c:\sasuser\exammap.sas	20MAY91

Figure 2

Applications

This menu contains two types of applications, Public and Private. The Public applications available are: Project Management Shell, Design and Analysis of Experiments, Ishikawa (Fishbone) Diagrams, and Control Charts and Process Capability Analysis.

The Experimental Design module allows you to construct an experimental design and when the runs have been completed to add the response values and analyze the design. The following designs are available: (1) two-level factorials and fractional factorials for 2 to 12 factors with or without blocking. All designs are resolution 4 or greater; (2) second order response surface designs - Central Composite with up to 8 factors and Box Behnken with up to 5 factors; (3) constrained mixture designs for a maximum of 12 factors; and (4) user-defined designs. The user-defined designs options lets you import a design already created and stored in a SAS data set.

The Control Charts and Process Capability Analysis consists of a subset of the procedures available in SAS/QC*. In order to access this module you must have SAS/BASE* and SAS/QC installed. SAS/GRAPH* software is not required but recommended so that charts and histograms can be produced using high resolution graphics mode. Control charts are available for both variables and attributes. The variable control charts available are: (1) mean and range charts, (2) mean and standard deviation charts, (3) median and range charts, (4) individual measurement and moving range charts, (5) mean chart with box-and-whisker plots, (6) uniformly weighted moving average chart. The attribute control charts available are: (1) proportions of nonconforming items, (2) numbers of nonconforming items, (3) numbers of nonconformities, (4) numbers of nonconformities per unit. The capability analysis generates quantiles and a histogram and evaluates specification limits. There is also an option to fit a curve to the data (beta, exponential, gamma, lognormal, normal, weibull).

Procedures

The Procedure menu accesses every procedure in the installed SAS system. When a particular procedure is called a series of fill-in-the-blank screens appear. Figures 3 and 4 give, respectively, the first two screens for the General Linear Model (GLM) procedure.

Command ==>

Type ? in any input data set name or variable name field to see a list

PROC GLM DATA = _____ OUTSTAT = _____ ;

Output data set of statistics

ENTER CLASSIFICATION VARIABLES (IF ANY) AND MODEL TO BE FIT:

CLASS ;

MODEL /

P [_] Print observed, predicted and residual values

O CLI [_] Print 95% confidence limits for individual values

P CLM [_] Print 95% confidence limits for mean values

T NOINT [_] Omit intercept from the model

I SOLUTION [_] Print parameter estimates when CLASS variables appear

O

N ENTER ANY OTHER MODEL OPTIONS NEEDED (ENTER HELP ON THE COMMAND

S LINE FOR INFORMATION ON AVAILABLE OPTIONS):

Enter SUBMIT to run procedure, CANCEL to quit without running
PAGE DOWN FOR MORE

Figure 3

Command ==>

LIST AND COMPARE CLASSIFICATION MEANS (enter MODEL effects):

MEANS /

To compare main effect means only, enter the method name(s) and other options if needed (Methods: BON DUNCAN GABRIEL REGWF REGWQ SCHEFFE SIDAK SMM SNK LSD TUKEY WALLER):

ALPHA = _____ Significance level for means comparisons (default: 0.05)

ENTER VARIABLES TO IDENTIFY PREDICTED VALUES AND CONFIDENCE LIMITS:

ID ;

DO ONE ANALYSIS FOR EACH COMBINATION OF LEVELS OF THESE VARIABLES:

BY ;

FREQ ; Variable indicating repetitions per observation if needed

WEIGHT ; Variable providing observation weights if needed

Enter SUBMIT to run procedure, CANCEL to quit without running
PAGE DOWN FOR MORE

Figure 4

Summary

SAS/ASSIST is a user friendly tool for performing statistical analyses without needing extensive knowledge of SAS* programming skills.

It is very easy to toggle between the Display Manager and SAS/ASSIST. Typing AF on the Display Manager command line sends you to SAS/ASSIST. Using the F10 key or the exit button in SAS/ASSIST sends you to the Display Manager. Also, one can access the Procedures menu while in the Display Manager mode by typing MENU on the command line.

In conclusion, SAS/ASSIST can be used by the novice SAS programmer to learn how to write simple SAS programs since the programs generated by SAS/ASSIST can be viewed and stored for later use.

Trademark Notice

*SAS, SAS/ASSIST, SAS/GRAPH, SAS/BASE, and SAS/QC are registered trademarks of SAS Institute, Inc., Cary, NC, USA.

Author

Margaret A. Nemeth
Monsanto Co., T2A
800 N. Lindbergh Blvd.
St. Louis, MO 63167
314-694-3613