SAS seminar 2003-Dec-04

Purpose: An overview of how to work with graphs in SAS.

Topics
- Procedures and applications producing graphs
- Essential concepts
- goptions: useful options
- Examples: gplot (goptions, titles, axis, legend, by-statment)
- Examples: templates
- Examples: annotated graphs
- Examples: box plots
- Examples: Routing graphs to external files

Tools for producing graphs

- Graph-n-go

- SAS/Insight

- SAS/Spectraview

- graphs in different by procedures
  - univariate: histogram, QQ-plot
  - lifetest: KM graphs
  - SAS/QC: shewhart (Box plots), capability (QQ, histogram..)
  - boxplot: Boxplots (+- 1.5*IQR)
  - reg: Regression diagnostics

- SAS/Graph procedures
  - gplot: Scatter/line graphs
  - g3d: 3D graphs
  - gchart: Bar charts

Concepts

- Graphs in SAS are controlled by graph options, e.g. "goptions display;"

- For each procedure there are default settings. Annotate the default setting by the use of **symbol**, **axis**, **legend**, **pattern**, **title** and **footnote** statements.

- Default all graphs are routed to a SAS catalog work.gseg and given names gplot, gplot1, gplot2 etc

- View/edit/delete graphs i gseg by the command line command cat work.gseg

- Copy to permanent destination by gout= option in graph procedure or by using proc catalog...

- Use ODS statment to produce RTF, PDF or HTML graphs.

Some useful graph options

Run proc goptions to view goptions set. Some useful graph options:

```
DEVICE=                    Graphics output device

Terminal: WIN for windows, XCOLOR for Unix/Linux, VT340 for VAX/VMS
Files: cgmof97l, png, emf

DISPLAY | NODISPLAY     Display graph on device
FTEXT=                  Default text font, e.g. simulate, "Arial"
HBY=                    BY line height (=0 for nodisplay)
HTEXT=                  Default text height
TARGETDEVICE=           Intended hardcopy device
ROTATE                  Rotate plot ninety degrees
```

The size (htext, hby, etc) are default in the unit "cells" if not specified by goption gunit=cells|cm|in|pct|pt. Trial and error!

Details

Graph statements:
1. title: j=L|R|C, f=, h=
2. axis: order, position(Ypct, Xpct), minor, label, value
3. legend: position, frame, label, value, shape
4. symbol: i=join|splines|boxjt25|stepj.. v=circle|dot|=|square....

Statement	Settings
title	j=L|R|C, f=, h=
axis	order=a to b by c, position=(Ypct, Xpct), minor=, label=(a=90 'asf'), value(j=L), logbase=2|e|10
legend	frame position=(inside left top) down=3

proc gplot

1. plot y*x
2. plot y*x=z
3. / **vref=a,b** *(for drawing vertical lines at y-axis positions a and b),* **href=a,b** *(for drawing horizontal lines at x-axis positions a and b)* **vaxis=axis1** *(use axis1 statement for the y-axis)* **haxis=axis2** *(use axis2 statement for the x-axis)* **overlay** *(together with a plot y*x y*z statment will draw both the y*x and y*z graphs overlaid on the same graph)*
4. plot2: as plot statement but draws an overlaid graph on the right y-axis

Annotate topics:

1. xsys, ysys, zsys
2. color, line, size
3. label, text, position
4. x, y, xlast, ylast, bar, line
5. x, y, move, draw

Examples:

- Low resolution graphics
- Default high resolution graph
- goptions targetdevice, ftext, htext, rotate
- symbol statement
- symbols "by z variable"
- axis statement + symbol splines interpolation
- legend statement + symbol step interpolation + rotate axis values
- SAS formatted legend labels
- Overlaid second graph + axis order= option
- Symbol statement pointlabels option
- Formatted pointlabels
- by-statement
- by-statement with uniform option and #byvar och #byval's in titles.