SAS®9 Graph Template Language Tip Sheet

Simple GTL Example

```
proc sort data=sashelp.class out=class;
  by sex;
run;

proc template;
  define statgraph groupreg;
    begingraph;
      entrytitle 'Separate Fit By Sex';
      layout overlay;
        scatterplot y=weight x=height /
          group=sex;
        regressionplot y=weight x=height /
          group=sex degree=3 name='reg';
        discretelegend 'reg' / title='Sex';
      endlayout;
    endgraph;
  end;
run;

proc sgrender data=class template=groupreg;
run;
```
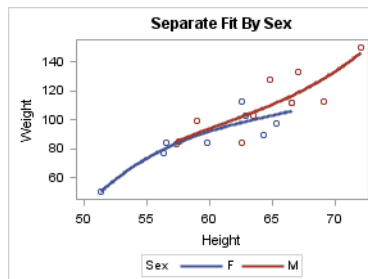

Other GTL Statements

```
notes "template-description";
dynamic dynamic-variable list;
mvar macro-variable list;
nmvar numeric-macro-variable list;
if (condition) GTL-statements
else GTL-statements
endif;
sidebar / <options>; GTL-statements  endsidebar;
cell / <options>; GTL-statements  endcell;
```

Layout Lattice Example

```
proc template;
  define statgraph res;
    begingraph;
      entrytitle 'Residuals by Predictor';
      layout lattice / rows=2 columns=2;
        layout overlay;
          scatterplot y=r x=height / group=sex;
          loessplot y=r x=height;
        endlayout;
        layout overlay;
          boxplot y=r x=sex;
        endlayout;
        layout overlay;
          scatterplot y=r x=age / group=sex;
          loessplot y=r x=age;
        endlayout;
      endlayout;
    endgraph;
  end;
run;
proc glm data=sashelp.class;
  class sex;
  model weight = height sex age;
  output residuals=r out=r;
run; quit;
proc sgrender data=r template=res;
  label r= 'Residuals';
run;
```
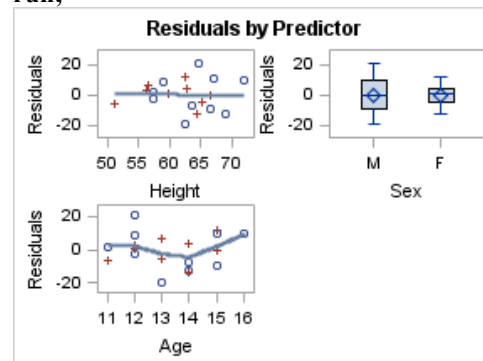

For more information, see:
Kuhfeld, W. F. 2010. *Statistical Graphics in SAS®: An Introduction to the Graph Template Language and the Statistical Graphics Procedures*. Cary, NC: SAS Press.
`support.sas.com/publishing/authors/kuhfeld.html`

For complete information, see the SAS® 9.2 documentation at
`http://support.sas.com/v9doc`

SAS®9

Graph Template Language Tip Sheet

This tip sheet places frequently used information in one place, on one sheet of paper, so you don't have to search through the online documentation. It also gives you something to take home, type in, and try.

ODS Graphics is an extension of ODS (the Output Delivery System). The Graph Template Language (GTL) specifies the layout and details of each graph produced by ODS. This powerful language includes statements for specifying plot layouts (such as lattices or overlays), plot types (such as scatter plots and histograms), and text elements (such as titles, footnotes, and insets). It also provides support for built-in computations (such as histogram binning) and the evaluation of expressions. Visual attributes of graphs are determined by the active ODS style. However, options are available for specifying colors, marker symbols, and other plot attributes.

This tip sheet presents the statements and options used that are most commonly used with the Graph Template Language in SAS® 9.2.

SAS 9 Graph Template Language Tip Sheet

GTL Overview

Each graph has an ODS template—a SAS program that provides instructions for creating the graph. SAS provides a template for every graph. You do not need to know *anything* about templates to create graphs. However, you can easily modify templates and make permanent changes that apply every time that you run SAS.

Graph Template Structure

```
proc template;
  define statgraph template-name;
    begingraph / <designheight=h
      designwidth=w> < options >;
      GTL-global-statements
      GTL-layout-block
    endgraph;
  end;
run;
```

Legend Statements

continuouslegend *names* / < *options* >;
discretelegend *names* / < *options* >;

Text Statements

entry *text-items* / < *options* >;
entryfootnote *text-items* / < *options* >;
entrytitle *text-items* / < *options* >;

Linear Axis Options

integer=*boolean*
origin=*number*
thresholdmax=*number*
thresholdmin=*number*
tickvaluefitpolicy=thin | other-policy
tickvalueformat=(*format-options*) | data | format
tickvaluelist=(*numeric-list*)
tickvaluepriority=*boolean*
tickvaluesequence=(start=*s* end=*e* increment=*i*)
viewmax=*number*
viewmin=*number*

Layout Statements

layout datalattice rowvar=*r-var* columnvar=*c-var* / < *options* >;
layout datapanel classvars = (*c-vars*) / <*options* >;
layout gridded / < *options* >;
layout lattice / <columns=*nc*> < rows=*nr*>
  <rowdatarange=data | union | unionall>
  <columndatarange=data | union | unionall>
  <rowweights=(*list*)> <columnweights=(*list*)>
  <rowgutter=*rg*> <columngutter=*cg*> <options>;
layout overlay / <xaxisopts=(*axis-options*)>
  <yaxisopts=(*axis-options*)>
  <x2axisopts=(*axis-options*)>
  <y2axisopts=(*axis-options*)> < *options* >;
layout overlayequated /
  <equatetype=square | fit | equate>
  <commonaxisopts=(*axis-options*)>
  <xaxisopts=(*axis-options*)>
  <yaxisopts=(*axis-options*)> < *options* >;
layout overlay3d / < *options* >;
layout prototype / < *options* >;

Axis Options

discreteopts=(*discrete-axis-options*)
display=standard | all | none | (*display-options*)
displaysecondary=none | all | standard | (*display-options*)
gridattrs=style-element (*line-options*)
griddisplay=auto_off | auto_on | on | off
label="*string*"
labelattrs=<*style-element*> (*text-options*)
linearopts=(*linear-axis-options*)
logopts=(*log-axis-options*)
offsetmax=auto | autocompress | number
offsetmin=auto | autocompress | number
reverse=*boolean*
shortlabel="*string*"
tickstyle=outside | inside | across
timeopts=(*time-axis-options*)
type=auto | discrete | linear | time | log

Plot Statements

bandplot y|x=*var* limitupper=*u-var* limitlower=*l-var* /
  <outlineattrs=<*style-element*>(*line-options*)>
  < *options* >;
barchart x=*x-var* / <stat=*stat*> <group=*g-var*>
  <orient=vertical | horizontal>
  <outlineattrs=<*style-element*>(*line-options*)>
  < *options* >;
barchartparm y=*y-var* x=*x-var* / <group=*g-var*>
  <orient=vertical | horizontal>
  <outlineattrs=<*style-element*>(*line-options*)>
  < *options* >;
bihistogram3dparm y=*y-var* x=*x-var* z=*z-var*s /
  < *options* >;
blockplot x=*x-var* block=*b-var* / < *options* >;
boxplot y|x=*var* / <orient=vertical | horizontal>
  < *options* >;
boxplotparm y|x=*var* stat=*s-var* /
  <orient=vertical | horizontal> < *options* >;
contourplotparm y=*y-var* x=*x-var* z=*z-var*s /
  < *options* >;
densityplot *var* / <kernel(*options*)>
  <normal(*options*)> < *options* >;
dropline y=*y-var* x=*x-var* / dropto=x|y
  <label=*l-var*> < *options* >;
ellipse y=*y-var* x=*x-var* / < *options* >;
ellipseparm xorigin=*x* yorigin=*y*
  semimajor=*s1-var* seminimor=*s2-var*
  slope=*slope* / < *options* >;
fringeplot *var* / < *options* >;
histogram *var* / <orient=vertical | horizontal>
  < *options* >;
histogramparm y=*y-var* x=*x-var* /
  <orient=vertical | horizontal> < *options* >;
lineparm y=*y-var* x=*x-var* slope=*s* /
  <group=*g-var*> <options>;
loessplot y=*y-var* x=*x-var* / <alpha=*a*>
  <clm=*"name"*> <degree=1|2> <smooth=auto|*s*>
  <interpolation=linear|cubic> <maxpoints=*m*>
  <lineattrs=<*style-element*>(*line-options*)>
  <group=*g-var*> < *options* >;

Plot Statements

modelband *name* / < *options* >;
needleplot y=*y-var* x=*x-var* / <group=*g-var*>
  < *options* >;
pbsplineplot y=*y-var* x=*x-var* / <alpha=*a*>
  <cli=*"name"*> <clm=*"name"*> <degree=*d*>
  <freq=*f-var*> <maxpoints=*m*> <nknots=*n*>
  <smooth=auto|*s*> <weight=*w-var*>
  <lineattrs=<*style-element*>(*line-options*)>
  <group=*g-var*> < *options* >;
referenceline x|y=*var* / < *options* >
  <lineattrs=<*style-element*>(*line-options*)>;
regressionplot y=*y-var* x=*x-var* / <alpha=*a*>
  <cli=*"name"*> <clm=*"name"*> <degree=*d*>
  <freq=*f-var*> <maxpoints=*m*> <weight=*w-var*>
  <lineattrs=<*style-element*>(*line-options*)>
  <group=*g-var*> < *options* >;
scatterplot y=*y-var* x=*x-var* / <datalabel=*l-var*>
  <group=*g-var*> <markercharacter=*m-var*>
  <markerattrs=<*style-element*>(*line-options*)>
  < *options* >;
scatterplotmatrix *var* / <datalabel=*l-var*>
  <group=*g-var*> <markercharacter=*m-var*>
  <diagonal=(<histogram> < normal> < kernel>)
  <markerattrs=<*style-element*>(*line-options*)>
  < *options* >;
seriesplot y=*y-var* x=*x-var* / <group=*g-var*>
  <display=standard | all>
  <lineattrs=<*style-element*>(*line-options*)>
  <markerattrs=<*style-element*>(*line-options*)>
  < *options* >;
stepplot y=*y-var* x=*x-var* / <datalabel=*l-var*>
  <lineattrs=<*style-element*>(*line-options*)>
  <markerattrs=<*style-element*>(*line-options*)>
  <group=*g-var*> < *options* >;
surfaceplotparm y=*y-var* x=*x-var* z=*z-var*s /
  < *options* >;
vectorplot y=*y-var* x=*x-var* xorigin=0 yorigin=0 /
  <datalabel=*l-var*> <group=*g-var*>
  <lineattrs=<*style-element*>(*line-options*)>
  < *options* >;