SAS 9 Graph Template Language Tip Sheet
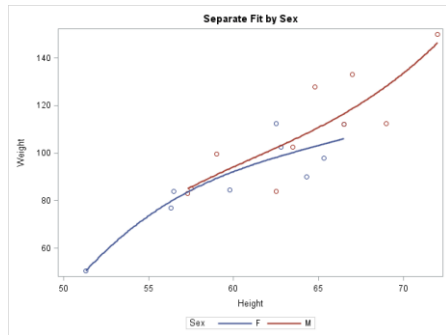
Simple GTL Example

```
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;
```
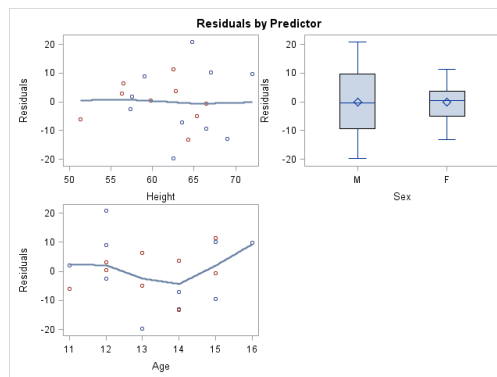

Other GTL Statements

```
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;
quit;

proc sgrender data=r template=res;
  label r= 'Residuals';
run;
```


For more information, see the following:

Basic ODS Graphics Examples
http://support.sas.com/documentation/prod-p/grstat/9.4/en/PDF/odsbasicg.pdf

Advanced ODS Graphics Examples
http://support.sas.com/documentation/prod-p/grstat/9.4/en/PDF/odsadvg.pdf

For complete information, see the SAS 9.4 documentation at http://support.sas.com/documentation/.

SAS 9

Graph Template Language Tip Sheet

This tip sheet collects frequently used information in one place so you don't have to search through the online documentation. It also gives you examples to take home 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 and 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, markers, and other plot features.

This tip sheet presents the statements and options that are most commonly used with the Graph Template Language in SAS® 9.4.

SAS 9 Graph Template Language Tip Sheet

GTL Overview

For every graph and style, SAS provides an ODS template, which is a SAS program that gives instructions for creating the graph or style. You do not need to know *anything* about templates to create statistical graphics. With just a little knowledge of the template languages, you can modify graph and style templates and make permanent changes that apply every time you run a procedure. Some GTL statements and options are listed on this page.

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*>;
legenditem type=*type* name="*name*" / <*options*>;
mergedlegend *names* / <*options*>;

Text Statements

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

Linear Axis Options

integer=*boolean*
minorticks=*boolean*
origin=*number*
thresholdmax=*number*
thresholdmin=*number*
tickvaluefitpolicy=thin | rotate | stagger / *other*
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 | squaredata>
   <commonaxisopts=(*axis-options*)>
   <xaxisopts=(*axis-options*)>
   <yaxisopts=(*axis-options*)> <*options*>;
layout overlay3d / <*options*>;
layout prototype / <*options*>;
layout region / <*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*)>
labelsplitchar="*character-list*"
labelsplitjustify=*justification*
linearopts=(*linear-axis-options*)
lineextent=full | data | *number*
logopts=(*log-axis-options*)
offsetmax=auto | autocompress | *number*
offsetmin=auto | autocompress | *number*
reverse=*boolean*
shortlabel="*string*"
tickstyle=outside | inside | across
tickvalueattrs=<style-element><(*options*)>
tickvaluehalign=left | center | right
tickvaluevalign=top | center | bottom
timeopts=(*time-axis-options*)
type=auto | discrete | linear | time | log

Plot Statements

axistable x=*x-var* value=*v-var* / <*options*>;
bandplot y|x=*var* limitupper=*u-var*
   limitlower=*l-var* /
   <outlineattrs=<*style-element*>(*line-options*)>
   <*options*>;
barchart category=*x-var* <response=*r-var*> /
   <stat=freq | pct | sum | mean | proportion>
   <group=*g-var*> <orient=vertical | horizontal>
   <*options*>;
barchartparm category=*x-var* response=*r-var* /
   <group=*g-var*> <orient=vertical | horizontal>
   <*options*>;
bihistogram3dparm y=*y-var* x=*x-var* z=*z-var*s /
   <*options*>;
blockplot x=*x-var* block=*b-var* / <*options*>;
boxplot y=*y-var* <x=*x-var*> /
   <orient=vertical | horizontal> <*options*>;
boxplotparm y=*y-var* <x=*x-var*> stat=*s-var* /
   <orient=vertical | horizontal> <*options*>;
bubbleplot y=*y-var* x=*x-var* size=*size-var* /
   <bubbleradiusmax=*dimension*>
   <bubbleradiusmin=*dimension*> <*options*>;
contourplotparm y=*y-var* x=*x-var* z=*z-var*s /
   <*options*>;
dendrogram nodeid=*n-var* parentid=*p-var*
   clusterheight=*c-var* / <*options*>;
densityplot *var* / <kernel(*options*)>
   <normal(*options*)> <*options*>;
dropline y=*y-var* x=*x-var* / dropto=x | y | both
   <label=*l-var*> <*options*>;
ellipse y=*y-var* x=*x-var* / <*options*>;
ellipseparm xorigin=*x* yorigin=*y*
   semimajor=*s1-var* semiminor=*s2-var*
   slope=*slope* / <*options*>;
fringeplot *var* / <*options*>;
heatmap<parm> y=*y-var* x=*x-var* /
   <colormodel=(*color-list*)> <*options*>;
highlowplot y | y=*var* low=*l-var* high=*h-var* /
   <*options*>;
histogram *var* / <orient=vertical | horizontal>
   <*options*>;
histogramparm y=*y-var* x=*x-var* /
   <orient=vertical | horizontal> <*options*>;
linechart category=*x-var* <response=*r-var*> /
   <*options*>;
lineparm y=*y-var* x=*x-var* slope=*s* /
   <group=*g-var*> <*options*>;

Plot Statements

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*>;
modelband *name* / <*options*>;
mosaicplotparm category=*vars* count=*c-var* /
   <*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*> <*options*>;
polygonplot y=*y-var* x=*x-var* id=*i-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 *vars* / <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*)>
   <*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*>;
textplot y=*y-var* x=*x-var* text=*t-var* / <*options*>;
vectorplot y=*y-var* x=*x-var* xorigin=0 yorigin=0 /
   <datalabel=*l-var*> <group=*g-var*>
   <lineattrs=<*style-element*>(*line-options*)>
   <*options*>;
waterfallchart category=*x-var* <response=*r-var*> /
   <*options*>;