An effective graph can reveal trends or patterns in your data that may have otherwise remained hidden in a tabular form. SAS 9.2 introduced a new family of procedures for creation of statistical graphs ranging from simple scatter plots to paneled displays to assist in data analysis.

This family of SG procedures includes the SGPLOT, SGSCATTER and SGPANEL procedures. The SG procedures provide a concise syntax to create graphs commonly used in data analysis in many domains.

With SAS 9.3, many features were added to make graphs easier, including Cluster Groups, Interval Box Plots, High Low plots, Attribute Maps and Annotation.

SAS 9.4 and the maintenance releases have added more features that make it really easy to customize your graphs, including setting of group attributes, splitting axis values, jittering, proportional column widths, heat maps, etc.

The AXISTABLE statement makes it easy to include axis aligned textual data in a graph. Marker symbols can be defined from font glyphs and image icons. The POLYGON and TEXT statements provide more flexibility for creating custom graphs and info graphs.

New features include grouped histograms and segment labels. Color and pattern groups are added to series plots to create spaghetti graphs. New options have been added with 9.40M5 to customize the axis and data labels.

These examples and their complete programs can be viewed at: [http://support.sas.com/rnd/datavisualization/yourGraphs/sgf/](http://support.sas.com/rnd/datavisualization/yourGraphs/sgf/)

```sas
/* City Mileage by Type */
title 'City Mileage by Type';
proc sgplot data=cars noautolegend noborder;
   scatter x=type y=mpg_city / jitter=uniform jitterwidth=1
         dataskin=sheen
         markerattrs=(symbol=circlefilled color=green);
   xaxis display=(nolabel noticks); 
   yaxis display=(nolabel noline noticks);
run;

/* Revenues (Millions) by Year */
title 'Revenues (Millions) by Year';
proc sgplot data=Coins noborder noautolegend;
   symbolimage name=Indian image="&Indian";
   scatter x=year y=val / jitterwidth=0.05
         markerattrs=(symbol=Indian size=110) jitter;
   text x=year y=YVal text=resp /
         textattrs=(size=20 color=white)
         strip position=top backlight=0.75;
   xaxis display=(nolabel noticks); 
   yaxis display=none <options> ;
run;
```
title 'Monthly Low and High Prices for Stocks';
proc sgplot data=sashelp.stocks  
(where=( stock ne 'IBM')) noborder; 
band x=date upper=high lower=low /  
group=stock nofill fillpattern outline;  
yaxis display=(<options>) grid;  
xaixs display=(<options>) grid;  
keylegend / title ='' location=inside  
position=topright across=1;  
run;

title 'Actual Values by Name with Data Labels';
proc sgplot data=bars noborder;  
hbar name / response=actual nostatlabel  
dataskin=pressed displaybaseline=auto  
datalabel=name  
datalabelattrs=(weight=bold)  
datalabelfitpolicy=insidepreferred  
categoryorder=respdesc;  
yaxis display=none;  
xaixs offsetmin=0 grid  
display=(nolabel noline noticks);  
run;

title 'Mileage by Type';
proc sgplot data=sashelp.cars noborder;  
vbar type / response=mpg_city stat=mean  
displaybaseline=auto;  
yaxis ranges=(0-27 43-55) grid;  
xaixs display=(nolabel noline noticks);  
run;

title 'Weight by Height';
proc sgplot data=class nowall noborder  
sganno=Circle; 
styleattrs axisbreak=bracket  
axisextent=data;  
scatter x=height y=weight / group=sex;  
yaxis ranges=(40-145 215-260) <options>;  
keylegend / location=inside <options>;  
run;
title 'Distribution of Blood Pressure';
proc sgplot data=heart;
  heatmap x=systolic y=diastolic / colormodel=(white green yellow red)
    nxbins=100 nybins=60 name='a';
  reg x=systolic y=diastolic / nomarkers degree=2 legendlabel='Fit';
  gradlegend 'a';
  keylegend / linelength=20 location=inside position=topright noborder;
run;

title 'QTc Change over Time by Treatment';
proc sgplot data=QTcData noborder;
  styleattrs axisextent=data;
  refline 26 / axis=x;
  refline 0 30 60 / axis=y;
  vbox qtc / category=week group=drug groupdisplay=cluster nofill;
  xaxistable risk / class=drug colorgroup=drug;
  yaxis label='QTc change...'
run;
**Claim Run-out Patterns by Claim Type per Year**

**Inpatient Claim Run-out Patterns per Year**

<table>
<thead>
<tr>
<th>Year</th>
<th>Month 06</th>
<th>Month 12</th>
<th>Month 24</th>
<th>Month 36</th>
<th>Month 48</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>$149,891</td>
<td>$151,037</td>
<td>$150,649</td>
<td>$146,572</td>
<td>$152,758</td>
</tr>
<tr>
<td>2011</td>
<td>$158,886</td>
<td>$160,006</td>
<td>$159,430</td>
<td>$156,914</td>
<td>$160,659</td>
</tr>
<tr>
<td>2012</td>
<td>$168,380</td>
<td>$169,224</td>
<td>$170,666</td>
<td>$169,281</td>
<td>$168,220</td>
</tr>
<tr>
<td>2013</td>
<td>$180,255</td>
<td>$180,656</td>
<td>$178,701</td>
<td>$178,287</td>
<td>$176,437</td>
</tr>
<tr>
<td>2014</td>
<td>$191,137</td>
<td>$193,045</td>
<td>$191,062</td>
<td>$190,873</td>
<td>$187,378</td>
</tr>
<tr>
<td>2015</td>
<td>$198,547</td>
<td>$197,834</td>
<td>$199,231</td>
<td>$201,039</td>
<td>$201,363</td>
</tr>
</tbody>
</table>

**WBC and Differential: Weeks 1-6**

**Average Barley Yields by Site and Variety**

**Average Barley Yields by ... Variety**

```plaintext
title 'Inpatient Claim Run-out ... Year';
proc sgpanel data=final;
  styleattrs wallcolor=cxe0f0e7;
  panelby year / layout=rowlattice onepanel
  uniscale=column noheader noborder spacing=3
  noheaderborder;
  series x=months y=value / markers <opts>;
  rowaxis display=none;
  colaxis display=none;
run;
```

```plaintext
title 'Average Barley Yields by ... Variety';
proc sgpanel data=dan.barley;
  styleattrs wallcolor='cxe0e0e4';
  panelby site / layout=rowlattice novarname
  sort=descmean onepanel noheader
  noborder spacing=10;
  dot variety / group=year response=yield
  stat=mean categoryorder=resdesc;
  inset site / position=bottomright nolabel;
  rowaxis display=(nolabel noline noticks)
  fitpolicy=none gridattrs=(color=white);
  colaxis display=(nolabel) grid <options>;
  grid gridattrs=(color=white);
run;
```