SAS 9.3 New Features

**Annotate**

Custom annotations can be added to the graphs from an annotation data set with reserved column names. Each observation defines one annotation object.

<table>
<thead>
<tr>
<th>Function</th>
<th>X1</th>
<th>Y1</th>
<th>Rotate</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>text</td>
<td>50</td>
<td>50</td>
<td>30</td>
<td>Confidential</td>
</tr>
</tbody>
</table>

Create a SAS data set with one annotation object of type text. Additional reserved columns needed to draw the text string are provided. Supported functions include rectangle, oval, image, arrow, line, polygons and polylines.

PROC SGLOT DATA=dataset SGANNO=anno;
SERIES X=var Y=var / GROUP=var;
RUN;

**Discrete Attribute Map**

Define a mapping between group values and visual attributes like line color or marker symbol for use with group roles using a SAS data set with reserved column names as shown below.

<table>
<thead>
<tr>
<th>Obs</th>
<th>Id</th>
<th>value</th>
<th>linecolor</th>
<th>markercolor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Severity</td>
<td>Severe</td>
<td>Red</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Moderate</td>
<td>Orange</td>
<td>Orange</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Mild</td>
<td>Green</td>
<td>Green</td>
</tr>
</tbody>
</table>

In this case we have created a SAS data set called sev, with one attribute map defined called “Severity”, that has three values “Severe”, “Moderate” and “Mild”. Line and marker colors are defined for each value. The map is used follows:

PROC SGPLOT DATA=dataset ATTRMAP=sev;
SERIES X=var Y=var / GROUP=var;
ATTID=severity;
RUN;

**New Plot Statements**

- **bournep**
- **HighLowplot**
- **Scatter**
- **Boxplot**
- **Waterfall**
- **Bar**
- **Vbar**
- **HB-bar**
- **Inset**
- **Legend**
- **LegendFrame**
- **Panel**
- **Tile**

**New Features**

- Scalable graphics for PDF, EMF, SVG and PS.
- Pad option on the procedure statement leave room around the outside of the graphs:
  PROC SGPLOT data=data pad=(top=5);  
- Cluster groups are supported for all plot types. Group values are placed side by side.  
  GROUPDISPLAY=cluster
- BOXPLOT supports interval data. To get this behavior, set x axis to linear.  
  AXIS TYPE=linear
- Categories can be ordered. VBAR CATEGORY=x / CATEGORYORDER=descending;
- Binning options for Histogram
  BINSTART, BINWIDTH, NBINS.
- Data skins for bar charts. DATASKIN=gloss, sheen, etc.
- New axis options
  LABELATTRS, VALUEATTRS, REVERSE, THRESHOLDMIN, THRESHOLDMAX.

**Example with new SAS 9.3 features**

**Cluster Groups:**

![Cluster Groups](image)

**Box plot on interval axis:**

![Box plot on interval axis](image)

**For more information, see:**


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SAS 9.4 New Features

All Procedure
Priority for rotation of group attributes can be set outside the style definition.

ODS GRAPHICS / ATTRPRIORITY=COLOR

Group attributes can be set using this statement inside the SGPLOT and SGPANEL procedures.

STYLEATTRS DATACOLORS=(color-list)
DATACONTRASTCOLOR=(color-list)
DATALINEPATTERNS=(line-pattern-list)
DATASYMBOLS=(marker-symbol-list);

For the SGSCATTER procedure, group attributes can be set by using these procedure options.

PROC SGSCATTER data=data
DATACOLORS=(color-list)
DATACONTRASTCOLOR=(color-list)
DATALINEPATTERNS=(line-pattern-list)
DATASYMBOLS=(marker-symbol-list);

New symbols can be defined using the following:

SYMBOLCHAR name= char= / opts >;
SYMBOLIMAGE name= image= / opts >;

SGPLOT Procedure - New Statements
BLOCK X=var BLOCK=var / opts >;
YAXISTABLE var-list / opts >;
YAXISTABLE var-list / opts >;
POLYGON x=var y=var / opts >;
HEATMAP x=var y=var / opts >;

SGPANEL Procedure - New Statements
INSET var-list / opts >;
BLOCK X=var BLOCK=var / opts >;

New Features

Procedure options
• High resolution rendering for line and bars. This is automatically set by procedure:
SUBPIXEL | NOSUBPIXEL

• When the summarization statistic is PERCENT, the value can be for the whole graph (default), for individual groups in a graph or across by groups.
FCTLEVEL=BY | GRAPH | GROUP | CELL

Fit policies for text strings
• Axis tick value string can be split to fit.
• Curve labels and data labels can be split.
• Bar labels can be rotated or split.

SGPANEL Procedure:
• Proportional row and column weights.
• Option can suppress headers.
FANELLBY var / PROPORTIONAL;
FANELLBY var / NOHEADER;

Example with new SAS 9.4 features

SGPLOT: Grouped Histograms:

Example with new SAS 9.4 features

SGPLOT: Jittering with filled markers:

SGPLOT: Broken axis, Gradient fill:

SGPLOT: Scatter with image symbols

Example with new SAS 9.4 features

SGPLOT: Polygon plot with overlays: