SAS 9.3 New Features

Discrete Attribute Map

Define a mapping between group values and visual attributes like line color or marker symbol for use with group roles.

Define a discrete attribute map:
DISCRETEATTRMAP NAME='map-name';
VALUE statement; (one or more)
ENDDISCRETEATTRMAP;

Define one or more value mappings:
VALUE 'string' / LINEATTRS=<opts>;
MARKERATTRS=<opts>;
FILLATTRS=<opts>;

Create a discrete attribute variable:
DISCRETEATTRVAR ATTRVAR=attr-var VAR=<var> ATTRMAP='map-name';

Use discrete attr var with the plot:
SCATTERPLOT X=var Y=var / GROUP=attr-var;

Range Attribute Map

Define a mapping between value ranges and colors for use with color response roles.

Define a range attribute map:
RANGEDATTRMAP NAME='map-name';
RANGE statement; (one or more)
ENDRANGEDATTRMAP;

Define one or more range mappings:
RANGE range-spec / RANGECOLOR=color RANGECOLORMODEL=(color-list);

Create a range attribute variable:
RANGEDATTRVAR ATTRVAR=attr-var VAR=<var> ATTRMAP='map-name';

Use range attr var with the plot:
BUBBLEPLOT X=var Y=var SIZE=var / COLORRESPONSE=attr-var;

New Plot Statements

BUBBLEPLOT X=var | Y=var SIZE=num-var / < options >;
HIGHLOWPLOT X=var | Y=var HIGH=num-var LOW=num-var / < opts >;
HEATMAPPARM X=var | Y=var COLORRESPONSE=num-var | COLORGROUP=var / < opt >;
MOASICPLOYTPARM CATEGORY=var-list COUNT=non-negative-num-var /
FILLATTRS=<opts>;
PIZECHART CATEGORY=var RESPONSE=var / < opts >;
WATERFALLCHART CATEGORY=var RESPONSE=var / < opts >

New Draw Statements

The DRAW statements listed below allow you to place custom graphics and text in your graph. The statements can draw in graph, layout, wall and data space with pixel, percent and data values.

DRAWARROW, DRAWIMAGE, DRAWLNE, DRAWOVAL, DRAMETECT
BEGINPOLYGON - DRAW - ENDPOLYGON
BEGINPOLYLINE - DRAW - ENDPOLYLINE.

New Features

- Scalable graphics output for PDF and EMF.
- Cluster groups are supported for all plot types.
- Group values are placed side by side.
- Boxplot supports interval data.
- Data skins for bar charts and pie charts.
- Fixed data label position.

Legend Item

Define an item that can be included in the legend by referring to its name.
LEGENDITEM TYPE=type NAME='name' / label='Mean' lineattrs=(color=red);

Example with new SAS 9.3 features

Cluster Groups:

Mileage by Type and Origin

```
Mileage By Type and Origin

Asia       Europe        USA

<table>
<thead>
<tr>
<th>Type</th>
<th>Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>30</td>
</tr>
<tr>
<td>Truck</td>
<td>25</td>
</tr>
<tr>
<td>Van</td>
<td>40</td>
</tr>
</tbody>
</table>

Legend:
- Car
- Truck
- Van
```

New Features in GTL for SAS 9.3 and 9.4

This tip sheet will get you started with many new GTL features in SAS 9.3 and SAS 9.4.

For SAS 9.3, GTL is part of SAS® Base. The new features include attribute maps, draw statements and plot statements such as high low plot, bubble plot, heat map and pie chart. Cluster grouping is supported for all plot types and box plot supports interval data.

For SAS 9.4, the new features include axis table, annotation and heat map. Text splitting is supported for tick values, curve labels and data labels. Marker jittering and proportional cell sizing are supported. Attribute priority and group attributes can be set in the template.
SAS 9.4 New Features

Annotations from SG anno data sets
SG annotation data sets can be used with the SGRENDER procedure to draw annotations on a GTL graph.

New Plot Statements
AXISTABLE X=var VALUE=var </ opts >;
AXISTABLE Y=var VALUE=var </ opts >;
LINECHART CATEGORY=var </ opt >;
HEATMAP X=var Y=var </ opt >;
HEATMAPFARM X=var Y=var COLORRESPONSE=var / COUNT=non-negative-num-var |
COLORGROUP=var </ opt >;
MOSAICPLOTPARM CATEGORY=var </ opt >;
POLYGONPLOT ID=var X=var Y=var VALUE=var </ opts >;
POLYGONPLOT ID=var X=var Y=var VALUE=var </ opts >;
COUNT=non-negative-num-var / (var-list);
LINECHART CATEGORY=var RESPONSE=var </ opt >;
AXISTABLE X=var VALUE=var </ opts >;
AXISTABLE Y=var VALUE=var </ opts >;
LINECHART CATEGORY=var </ opt >;
HEATMAP X=var Y=var </ opt >;
HEATMAPFARM X=var Y=var COLORRESPONSE=var / COUNT=non-negative-num-var /
COLORGROUP=var </ opt >;
MOSAICPLOTPARM CATEGORY=var </ opt >;
POLYGONPLOT ID=var X=var Y=var VALUE=var </ opts >;
POLYGONPLOT ID=var X=var Y=var VALUE=var </ opts >;
COUNT=non-negative-num-var / (var-list);

New Features
Global options on the BEGINGRAPH statement.
- Attribute priority for ODS style.
- Data skin for all plots. Local overrides are available on all plot statements.
- Group attributes lists for color, contrast color, line patterns and symbols. These override the lists from the active style.
- Label placement algorithm.
- Subpixel for high resolution rendering of line plots and bar charts.

Fit policies for axis and other places
- Axis tick value string can be split to fit.
- Curve labels and data labels can be split.
- Bar labels can be rotated or split.

Layout features
- Preferred weights for layout lattice.
- Proportional weights for data panel and lattice.
- Sort order for data panel and lattice headers.
- Equate type of square data.

- Outer pad for legends and axes.
- Inner margins supported on all four sides.

Plot features
- Filled markers can now be rendered with fill and outline. Markers can be skinned.
- Jitter option for scatter plot added to shift the markers when they overlap. Jittering is supported for discrete and interval axis.
- Error bar cap shape can be set.
- Matrix type full or upper or lower triangle.
- Suppress tips on individual plot.
- Label strip for data and marker character.
- Auto clip caps for low high bar.

Attributes map from data sets
Discrete attribute maps defined in datasets can be used with SGRENDER procedure with SAS 9.4M1.

Define custom symbols
Custom marker symbols can be defined in the BEGINGRAPH block using image icons or font glyphs with SAS 9.4M1. These symbols can then be referred to just like any other predefined symbol name.

Example with new SAS 9.4 features
Split axis tick values:

Example with new SAS 9.4 features
Bar label fitting

Example with new SAS 9.4 features
Proportional cell sizing for data lattice:

Example with new SAS 9.4 features
Annotation from data set:

Symbol Image statement: