Graph Template Language (GTL) is the power tool you need to create any and all types of graphs in SAS. It also forms the foundation of the system that is used by SG Procedures and ODS Graphics Designer to render the graphs.

GTL is structured and easy to use. It creates visually aesthetic graphs that effectively communicate the results of your analysis with minimal coding. GTL also provides a wide range of features and options to customize the graph. These features can be used to create single-cell multi-layered graphs, multi-cell graphs, multi-level classification panels and matrix plots. Layouts can be nested for maximum flexibility.

GTL provides a building block approach to creating a graph. The basic statements and features can be combined in creative ways to construct the graph you need. These are:

- Plot statements
- Layout statements
- Titles, Footnotes, Entries & Legends.
- Conditional syntax and Function evaluation
- Dynamics and Macro Variables

This handout shows some examples of graphs created using GTL from SAS 9.2 (TS2M0) release and some examples use SAS 9.3 features.

Finally, graphs are included that use new plot statements and features to be released with SAS 9.4. SAS 9.4 GTL also supports SG annotation using the same data set definition used by SG procedure annotations.

These examples and their complete programs can be viewed at the following location: [http://support.sas.com/rnd/datavisualization/yourGraphs/analyticalCustom/sgf2013](http://support.sas.com/rnd/datavisualization/yourGraphs/analyticalCustom/sgf2013)

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**A History of Home Values for USA**

The Yale economist Robert J. Schiller created an index of American Housing prices going back to 1890. It is based on sale prices of standard existing homes, not new construction, to track the value of housing as an investment over time. It presents housing values in consistent terms over 116 years, factoring out the effects of inflation.

The 1890 benchmark is 100 on the chart. If a standard house sold in 1890 for $100,000 (inflation adjusted to today’s dollars), an equivalent standard house would have sold for $85,000 in 1920 (65 on the index scale) and $199,000 in 2006 (190 on the index scale), or 55% higher than 1890.

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*Decline and Run-Up:* Prices dropped as mass production techniques appeared early in the 20th century. Prices spiked with post-war housing demand.

*Boom Times:* Two gains in recent decades were followed by returns to levels consistent since the late 1950’s. Since 1997, the index has risen about 83 percent.

This graph was created using the new SGAAnnotation support in GTL

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**V94_Schiller_Plot – Uses SAS 9.4 SGAAnnotation**
Histogram.sas

Top20AdverseEvents.sas

EyeIrritation.sas
(Simulated data) Stacked Graphs. Byron & Wattenberg. IEEE InfoVis 2008

**ThemeRiver.sas**

**Heat Maps with Discrete Axes**

Emerging Issues

DNA Microarray

**HeatMaps.sas**

**Probability Distribution Functions with Placebo and MDA**

This graph uses the new DATACOLORS option on BEGINGRAPH statement to set group colors.

**V94_Bean_Plot.sas** – Uses SAS 9.4 options to set group colors in BEGINGRAPH
**V9.4_Lipid_Profile_Group.sas** – Uses SAS 9.4 Axis Table

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**V94_Forest_Plot.sas** - Uses SAS 9.4 indented Axis Table

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**V94_Jitter_cars.sas** - Uses SAS 9.4 ScatterPlot with JITTER option in a proportional data lattice.

For more examples and tips on creating graphs visit [http://blogs.sas.com/content/graphicallyspeaking/](http://blogs.sas.com/content/graphicallyspeaking/).