STAT604 SAS Lesson 17

SAS

Graphics Techniques

The SGPLOT and SGPANEL Procedures – SAS Documents

SAS

Introduction to SAS ODS Graphics

ODS Statistical Graphics (also known as ODS Graphics) is functionality for easily creating statistical graphics. It is available in a number of SAS products, including SAS/STAT, SAS/ETS, SAS/QC, and SAS/GRAPH software.

Documentation (1882 pages):

SAS® 9.4 ODS Graphics: Procedures Guide, Sixth Edition

http://documentation.sas.com/api/docsets/grstatproc/9.4/content/grstatproc.pdf?locale=en #nameddest=n1e0ztxxbnqjgnn182s1te817t3i

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SAS ODS Graphics Procedures

There are seven ODS Graphics procedures. Each has a specific purpose:

- **SGPLOT**
  - creates single-cell plots with a variety of plot and chart types and overlays.

- **SGPANEL**
  - creates classification panels for one or more classification variables. Each graph cell in the panel can contain either a simple plot or multiple, overlaid plots.

Note: The SGPLOT and SGPANEL procedures largely support the same types of plots and charts and have an almost identical syntax. The main distinction between the two procedures is that the SGPANEL procedure produces a panel of graphs, one for each level of a classification variable.

SAS ODS Graphics Procedures (Self-Study)

- SGPIE (Preproduction)

  - New in SAS 9.4M6. Creates pie and donut charts.

- SGMAP

  - Provides concise syntax for creating geographical maps and overlaying other plots onto the map.

- SGSCATTER

  - Creates scatter plot panels and scatter plot matrices with optional fits and ellipses.

- SGRENDER

  - Produces graphs from graph templates that are written in the Graph Template Language. You can also render a graph from a SAS ODS Graphics Editor (SGE) file.

- SGDESIGN

  - Creates graphical output based on a graph file that has been created by using the ODS Graphics Designer application.

List of Plots and Charts

Band plot

Bar chart

Block plot

Box plot

Bubble plot

Density plot

Donut chart

Dot plot

Ellipse plot

Fringe plot

Heat map

High-Low plot

Histogram

Line chart

Line, drop

Line, parameterized

Line, reference

Loess plot

Needle plot

Penalized B-Spline plot

Pie chart

Regression plot

Scatter plot

Series plot

Spline plot

Step plot

Text Inset

Text plot

Vector plot

Waterfall chart

Handwritten annotation: Available in SGPlot / Don't need to know every chart / this PG

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Producing Charts with the SGPLOT Procedure

General form of the PROC SGPLOT procedure:

PROC SGPLOT DATA=*SAS-data-set*;

       TYPE1 chart-variable(s). . . </ options>;
       TYPE2 chart-variable(s) . . . </ options>;

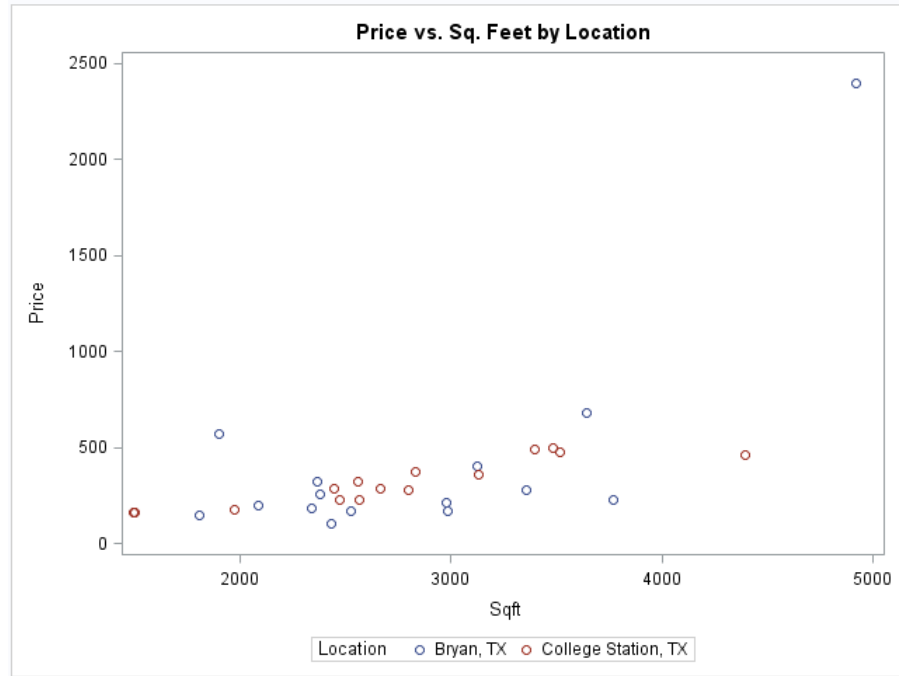**RUN**;

Producing Charts with the SGPLOT Procedure

Example:

```
title 'Price vs. Sq. Feet by Location';
proc sgplot data=bcs;
      scatter x=sqft y=price /group=location;
run;
```

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Producing Charts with the SGPLOT Procedure

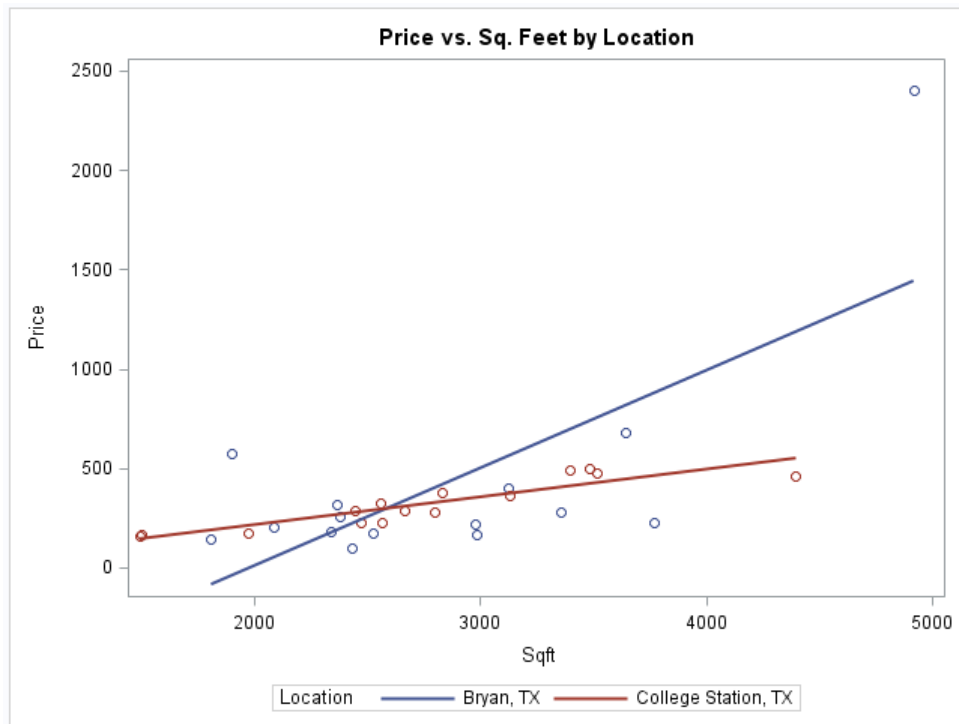Results:

Fit Lines with the SGPLOT Procedure

Example:

```
title 'Price vs. Sq. Feet by Location';
proc sgplot data=bcs;
        reg x=sqft y=price /group=location;
run;
```

Insted of satkg, adds a fit line for each group (handwritten annotation)

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Fit Lines with the SGPLOT Procedure

Results:

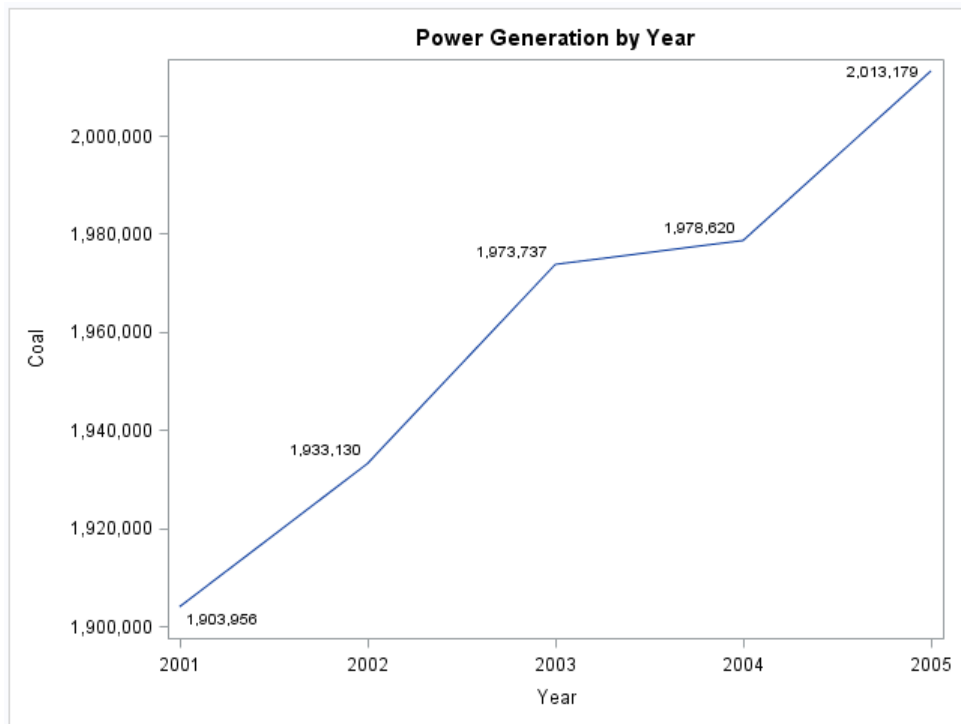# Producing Lines with the SGPLOT Procedure

Example:

```
title 'Power Generation by Year';
proc sgplot data=sashelp.electric;
        where year >= 2001
            and customer="Residential";
        series x=year y=coal / datalabel;
run;
```

- can use where statement on proc sgplot
- series adds lines than datapts.
- data label adds data values at point

Producing Lines with the SGPLOT Procedure

Results:
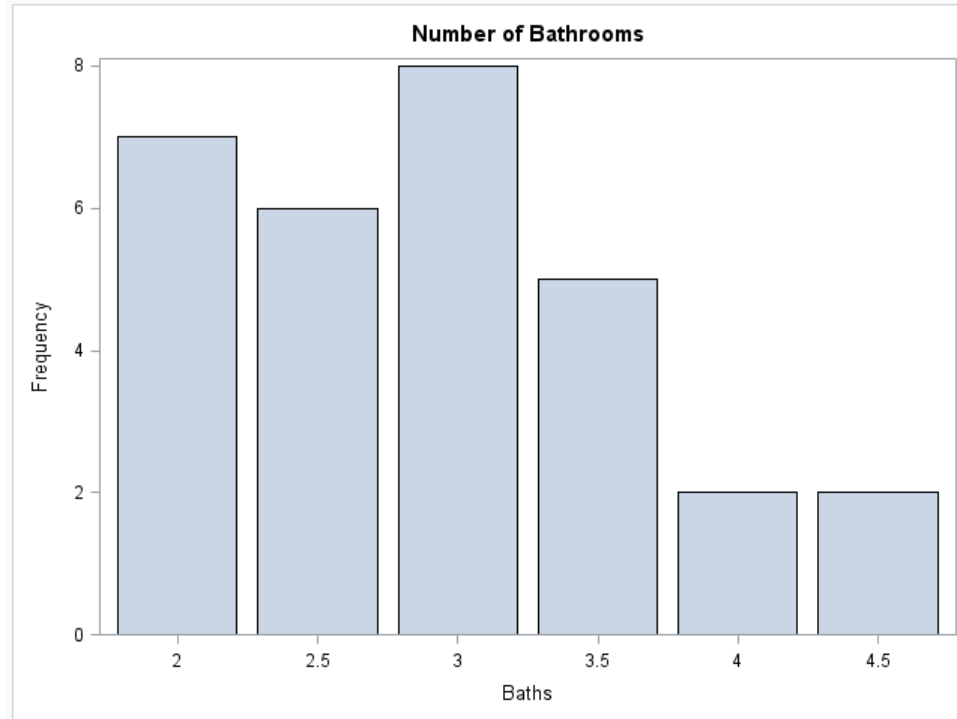
Bar Plots with the SGPLOT Procedure

Example:

```
title 'Number of Bathrooms';
proc sgplot data=bcs;
      vbar baths;
run;
```

Bar Plots with the SGPLOT Procedure

Results:

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Histograms with the SGPLOT Procedure
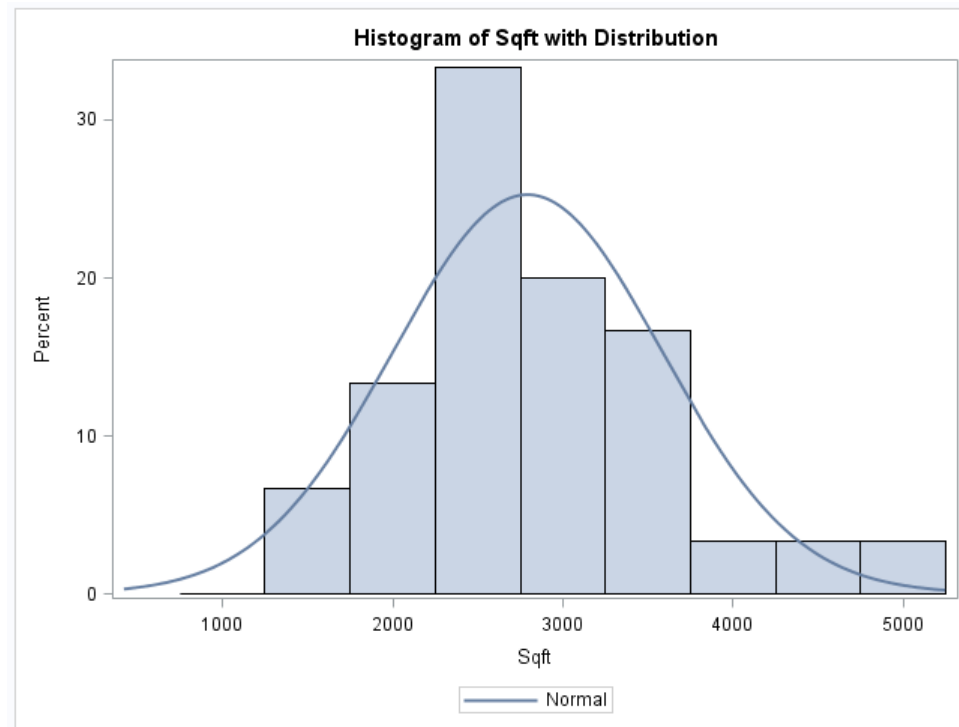
Example:

```
title 'Histogram of Sqft with Distribution';
proc sgplot data=bcs;
       histogram sqft / binwidth=500 ;
       density sqft;
run;
```

goes density line.

space

binwidth

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Histograms with the SGPLOT Procedure

Results:

Boxplots with the SGPLOT Procedure

Example:

```
title 'Real Estate Sales Prices';
proc sgplot data=bcs;
        vbox price /group=location;
run;
```

group is an option

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Boxplots with the SGPLOT Procedure

Results:

Mean Marker

Producing Charts with the SGPANEL Procedure

General form of the PROC SGPANEL procedure:

```
PROC SGPANEL DATA=SAS-data-set;

   PANELBY group-variable;

             TYPE1 chart-variable(s). . . </ options>;
             TYPE2 chart-variable(s) . . . </ options>;

RUN;
```
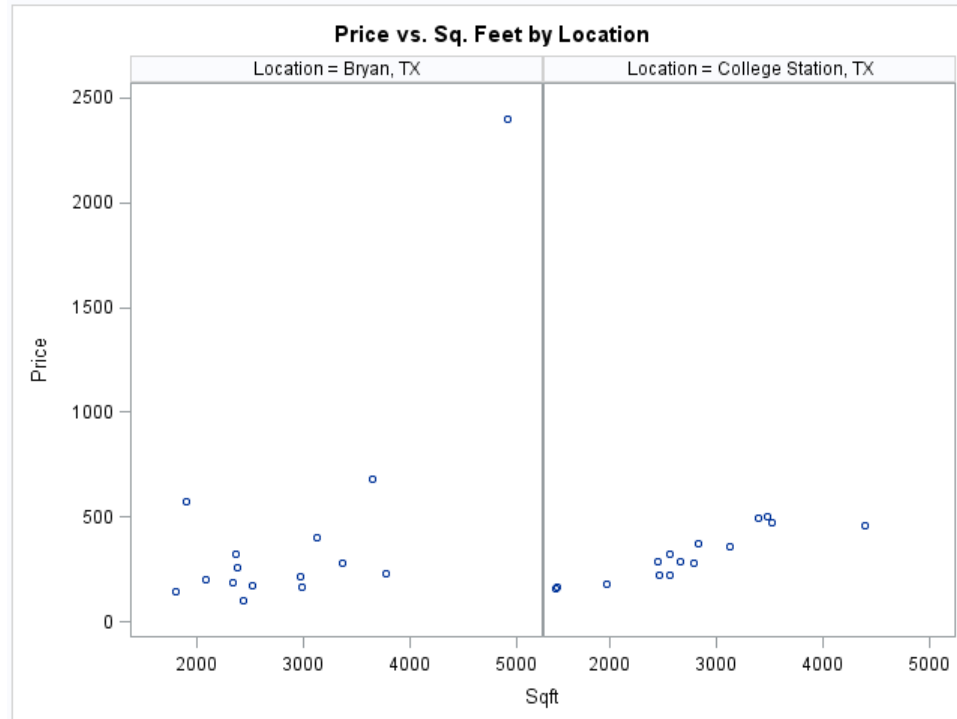
Producing Charts with the SGPANEL Procedure

Example:

```
title 'Price vs. Sq. Feet by Location';
proc sgpanel data=bcs;
       panelby location;
       scatter x=sqft y=price;
run;
```

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Producing Charts with the SGPANEL Procedure
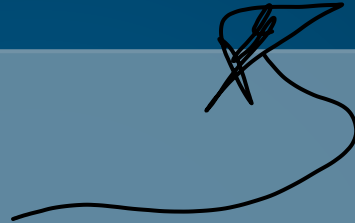
Results:

Visualizing data with graphics procedures

This demonstration explores a few of the options for the GPLOT and GPANEL procedures.

Just rms code from slides

22-Graphics

Linear Models

The REG Procedure

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Producing Models with the REG Procedure

General form of the PROC REG procedure:

```
PROC REG DATA=SAS-data-set;

        MODEL model specifications;
        <CODE FILE= "SAS program.sas">;

RUN; QUIT;
```

needs both run & Quit.

• Requires SAS STAT license

• MODEL - specifies the dependent and independent variables, etc.

• CODE – writes DATA STEP code for predicting values according to the fitted model

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Producing Models with the REG Procedure

Example:

```
title 'Model of Min Pressure/Max Wind';
PROC REG DATA=pg1.storm_final;
       MODEL maxwindmph=minpressure;
       CODE FILE = "&path.stormmodel.sas";
run;
```

(handwritten annotations):

maxwind is dependant on minpressure

macro variable containing path.

need period after macro as delimiter

Analyzing data with PROC REG

This demonstration shows the basic operation and output produced by the REG procedure

22-Graphics

STAT 604 Takeaways

1. Know thy data

2. Pay attention to detail

3. Error-free log does not mean results are correct.

4. Think!