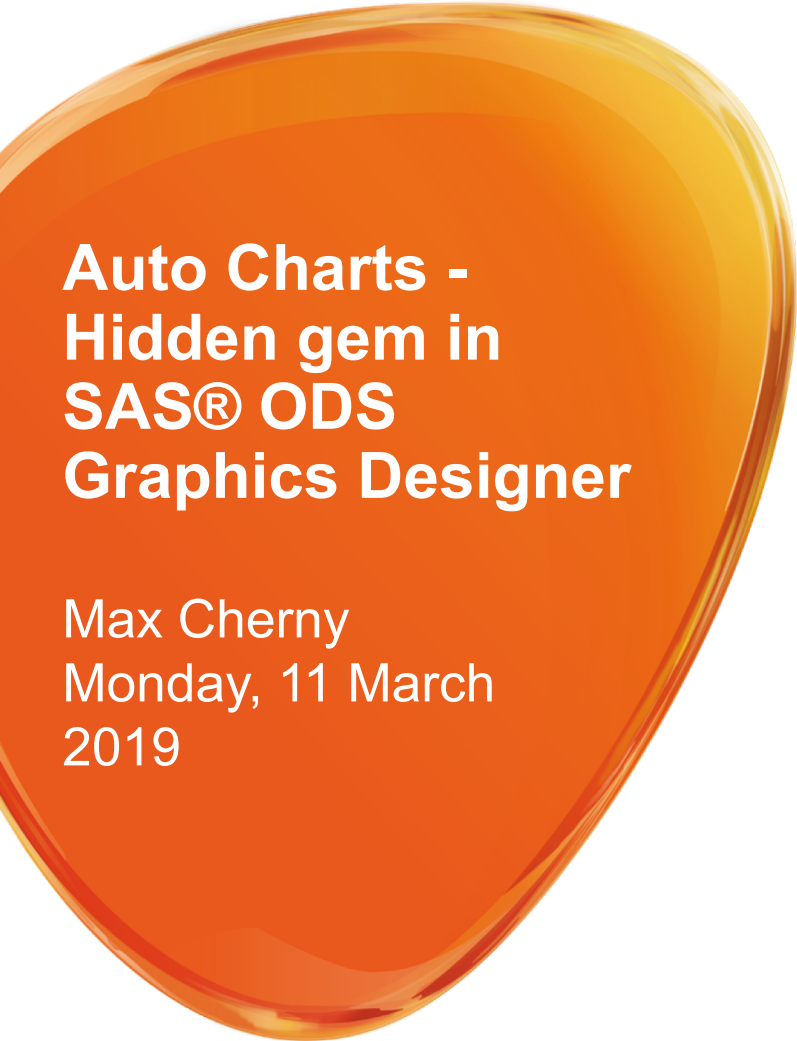




Auto Charts - Hidden gem in SAS® ODS Graphics Designer

Max Cherny
Monday, 11 March
2019

- Overview of Auto Charts
- Using Auto Charts
 - Example 1
 - Example 2
- Q&A

Overview of Auto Charts



- Automatically creates many possible figures based on variables in a dataset
- Code behind each figure can be reviewed and modified further as needed
- Ideal for experimentation, quick generation of graphs and learning ODS graphics
- Easy to use
- No prior experience with graphics or ODS is needed

Example 1: Scatter plot



Input dataset contains baseline heart rate and weight per subject:

Subject (Subject)	Treatment (Treatment)	Heart Rate (HeartRate)	Weight (Weight)
1	A	79	80
2	A	60	91
3	B	100	67
4	A	65	77
5	B	88	88
6	A	102	71
7	B	65	86
8	B	87	75
9	B	98	90
10	A	101	78

[illegible] **Favorite Folders**

File Edit View Tools Run Solutions Help

00001
00002
00003
00004
00005

— x



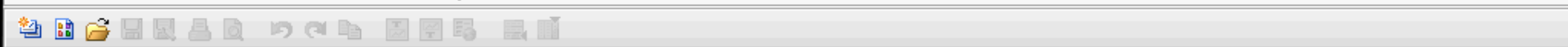
SAS: Program Editor-start.sas

File Edit View Tools Run Solutions Help

```
00001 %sgdesign;
00002
00003
00004
00005
```

— x





Elements

Plot Layers

- Scatter
- Series
- Needle
- Step
- Histogram
- Histogram(h)
- Box
- Box(h)
- Bar
- Bar(h)
- BarError
- BarError(h)

Insets

-
-

Graph Gallery

Basic Grouped Analytical Custom Matrix Panels

- Scatter Plot
- Series Plot
- Step Plot
- Histogram
- Vertical Box
- Horizontal Box
- Vertical Bar
- Horizontal Bar
- Contour Plot

Scatter Series Needle Step Histogram Histogram(h) Box Box(h) Bar Bar(h) BarError BarError(h)

Basic Grouped Analytical Custom Matrix Panels

Scatter Plot Series Plot Step Plot

Histogram Vertical Box Horizontal Box

Vertical Bar Horizontal Bar Contour Plot

Scatter Series Needle Step Histogram Histogram(h) Box Box(h) Bar Bar(h) BarError BarError(h)

Basic Grouped Analytical Custom Matrix Panels

Scatter Plot Series Plot Step Plot

Histogram Vertical Box Horizontal Box

Vertical Bar Horizontal Bar Contour Plot

(0 observations)

Type

Delete All

Advanced Plots

 [Terminal]

[SAS: Session ...

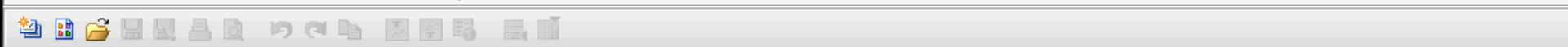
SAS: ToolBox: ...

SAS: Results

SAS: Explorer

SAS: Output-U...

 SAS: Program ..



Scatter Series

Needle Step

Histogram Histogram(h)

Box Box(h)

Bar Bar(h)

BarError BarError(h)

Generate Graphs

Library: WORK Data Set: <none> (0 observations)

Type	
WORK	
TEST	
SASHELP	
SASUSER	

Open Save As Delete Delete All

Select graph types:

☒ Univariate ☒ Bivariate

☐ Grouped ☐ Advanced Plots

Plot Layers

Plot Layers

Scatter

Series

Needle

Step

Histogram

Histogram(H)

Box

Box(H)

Bar

Bar(H)

BarError

BarError(H)

Insets

 Auto Charts

Library: TEST

Data Set:

(0 observations)

Variable

Details

Type

Open

Save As

Delete

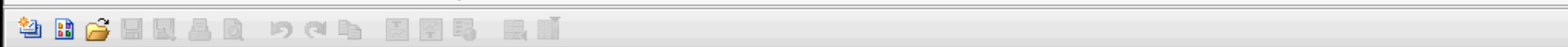
Delete All

Select graph types:

☒ Univariate☒ Bivariate☐ Grouped

Advanced Plots

Generate Graphs



Scatter Series

Needle Step

Histogram Histogram(h)

Box Box(h)

Bar Bar(h)

BarError BarError(h)

Library: TEST Data Set: <none> (0 observations)

<none>		
Variable	Details	Type
HEARTRATEBYVISIT		
VITALSIGNS		

Delete Delete All

Select graph types:

☒ Univariate ☒ Bivariate

☐ Grouped ☐ Advanced Plots

Generate Graphs

Scatter
 Series
 Needle
 Step
 Histogram
 Histogram(h)
 Box
 Box(h)
 Bar
 Bar(h)
 BarError
 BarError(h)

	Variable	Details	Type
☐	SUBJE...	1 - 10	Continuous
☐	TREAT...	2	Discrete
☐	HEART...	60 - 102	Continuous
☐	WEIGHT	67 - 91	Continuous

Library: TEST Data Set: VITALSIGNS (10 observations)

	Variable	Type	Details
☒	SUBJECT	Continuous	1 - 10
☒	TREATMENT	Discrete	2
☒	HEARTRATE	Continuous	60 - 102
☒	WEIGHT	Continuous	67 - 91

Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☐ Grouped
- ☐ Advanced Plots

Generate Graphs

Open Save As Delete Delete All | 27 graphs (0 new)

Library: TEST Data Set: VITALSIGNS (10 observations)

	Variable	Type	Details
☒	SUBJECT	Continuous	1 - 10
☒	TREATMENT	Discrete	2
☒	HEARTRATE	Continuous	60 - 102
☒	WEIGHT	Continuous	67 - 91

Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs

Open Save As Delete Delete All | 27 graphs (0 new)

Elem...

Plot Layers

Scatter

Series

Needle

Step

Histogram

Histogram

Insets

Auto Charts

Library: TEST Data Set: VITALSIGNS (10 observations)

	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Select graph types:

☒ Univariate
 ☒ Bivariate
☒ Grouped
 ☒ Advanced Plots

Generate Graphs

Open Save As Delete Delete All | 0 graphs (0 new)

Generating graphs (0 of 32)

0%

Library: TEST Data Set: VITALSIGNS (10 observations)

	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuous
☒	TREATMENT	2	Discrete

Open Save As Delete Delete All | 0 graphs (0 new)

Generating graphs (5 of 32)

Graph Creation Error



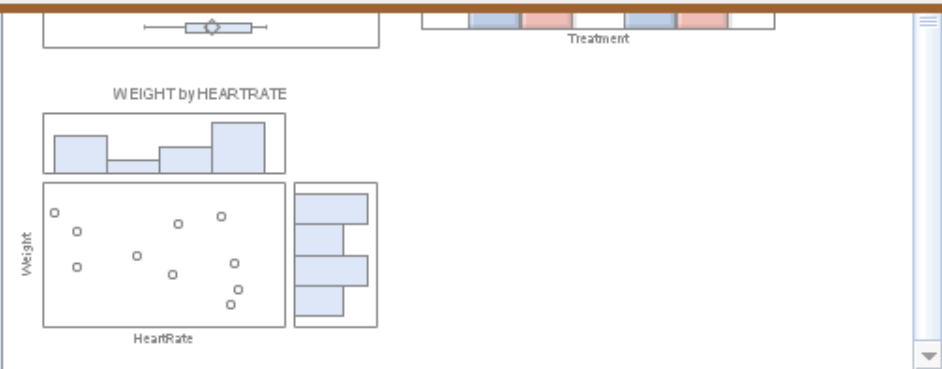
WARNING: Confidence and/or prediction limits could not be computed for one or more groups.
 WARNING: The modelband statement named 'modelband' will not be drawn because one or more of the required arguments were not supplied.
 WARNING: The modelband statement named 'modelband2' will not be drawn because one or more of the required arguments were not supplied.
 The current change will be discarded.

OK

Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs



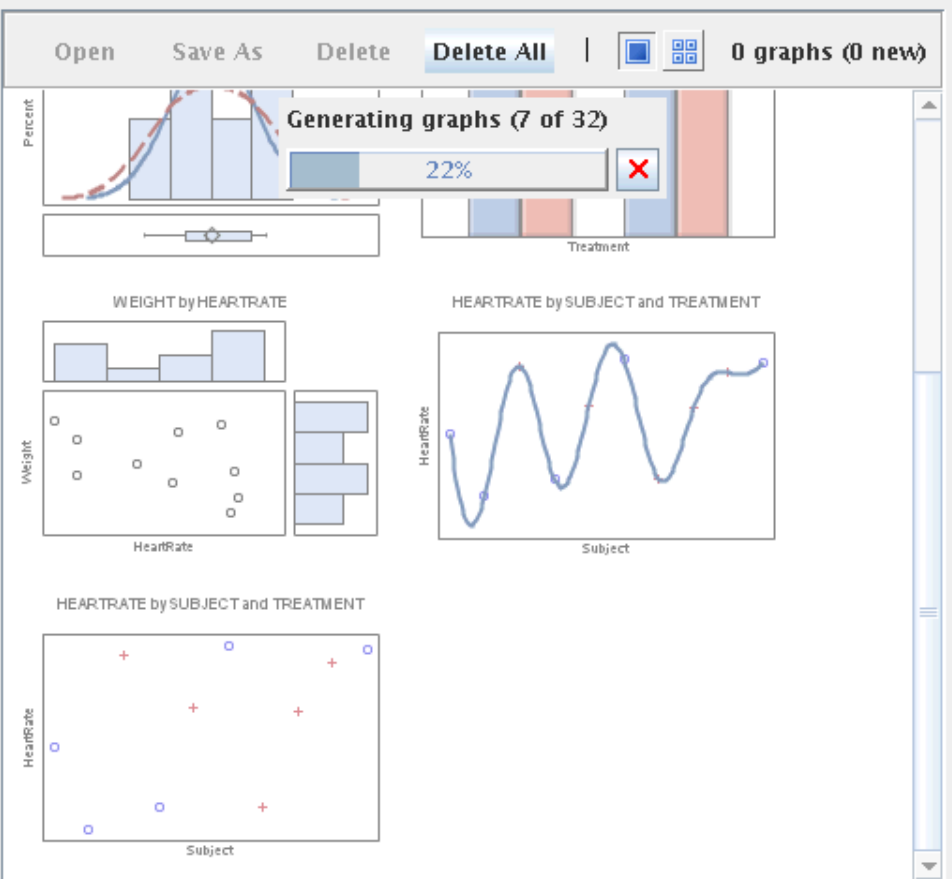
Library: TEST Data Set: VITALSIGNS (10 observations)

	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Select graph types:

☒ Univariate
 ☒ Bivariate
 ☒ Grouped
 ☒ Advanced Plots

Generate Graphs



Library: TEST

Data Set: VITALSIGNS (10 observations)

	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs



Library: TEST Data Set: VITALSIGNS (10 observations)

	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Select graph types:

☒ Univariate ☒ Bivariate

☒ Grouped ☒ Advanced Plots

Generate Graphs



Library: TEST

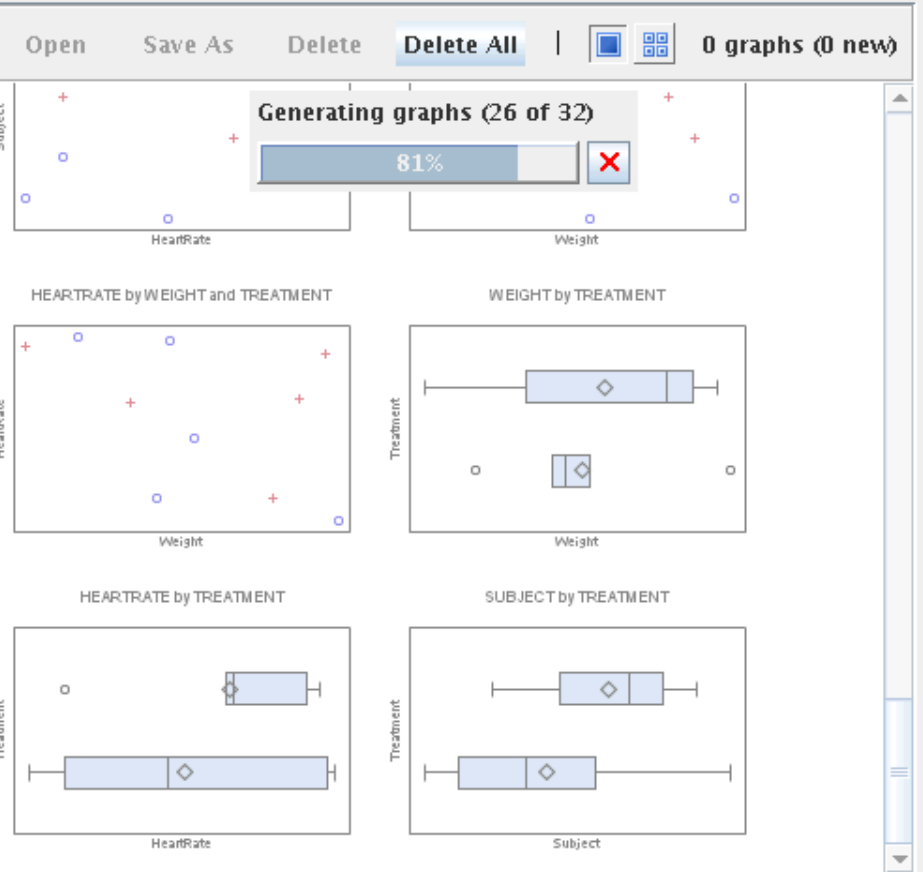
Data Set: VITALSIGNS (10 observations)

	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs



Library: TEST

Data Set: VITALSIGNS (10 observations)

	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Select graph types:

- ☒ Univariate
 ☒ Bivariate
☒ Grouped
 ☒ Advanced Plots

Generate Graphs

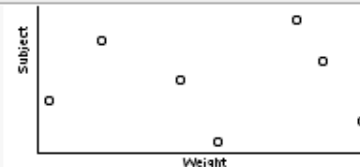
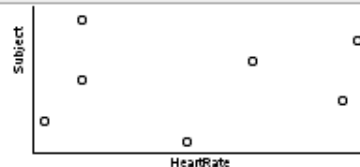
Open

Save As

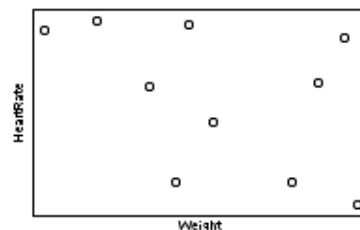
Delete

Delete All

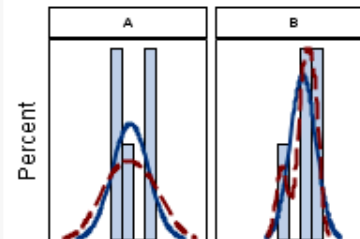
32 graphs (32 new)



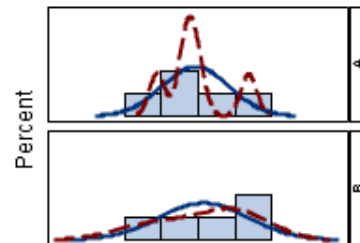
HEARTRATE by WEIGHT



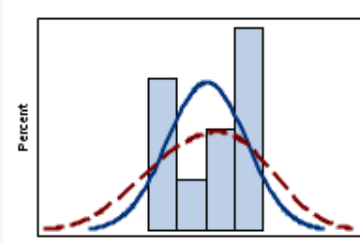
Panel of HEARTRATE Distribution



Panel of WEIGHT Distribution



HEARTRATE Distribution



Library: TEST

Data Set: VITALSIGNS (10 observations)

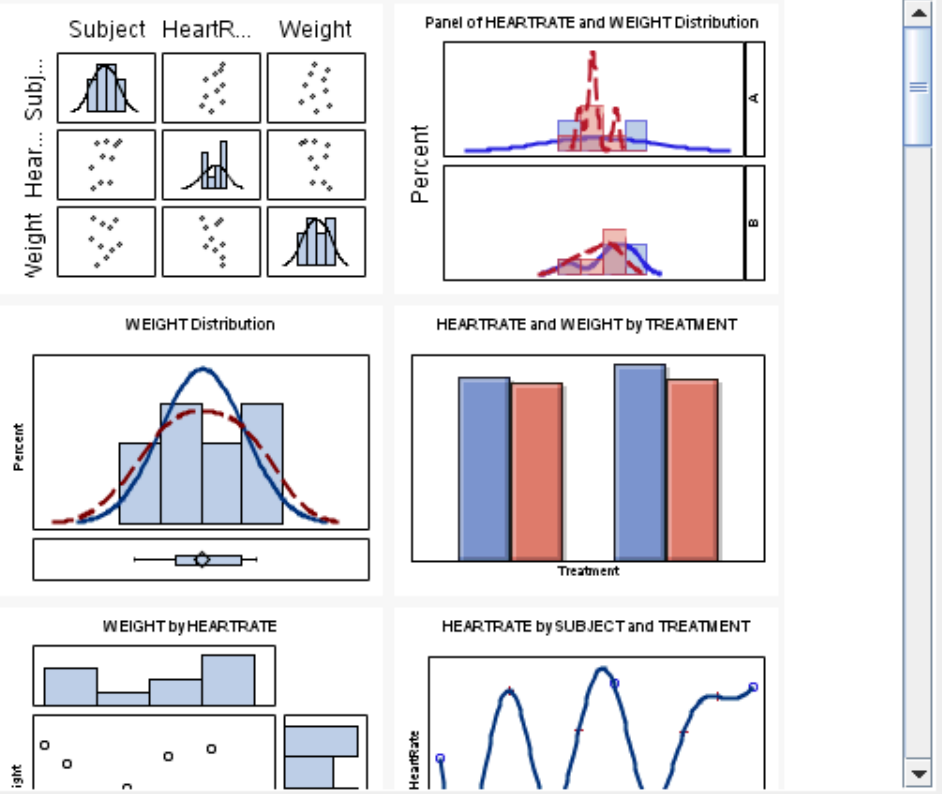
	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs

Open Save As Delete Delete All 32 graphs (32 new)



Library: TEST

Data Set: VITALSIGNS (10 observations)

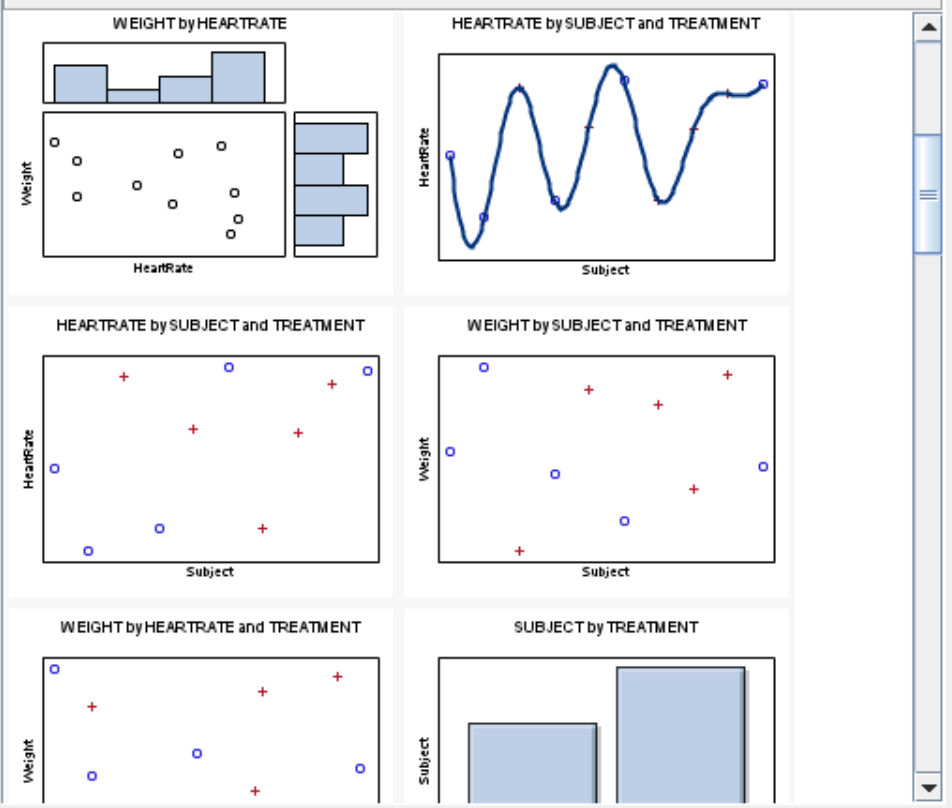
	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Select graph types:

- ☒ Univariate
 ☒ Bivariate
- ☒ Grouped
 ☒ Advanced Plots

Generate Graphs

Open Save As Delete Delete All | 32 graphs (32 new)



Library: TEST

Data Set: VITALSIGNS (10 observations)

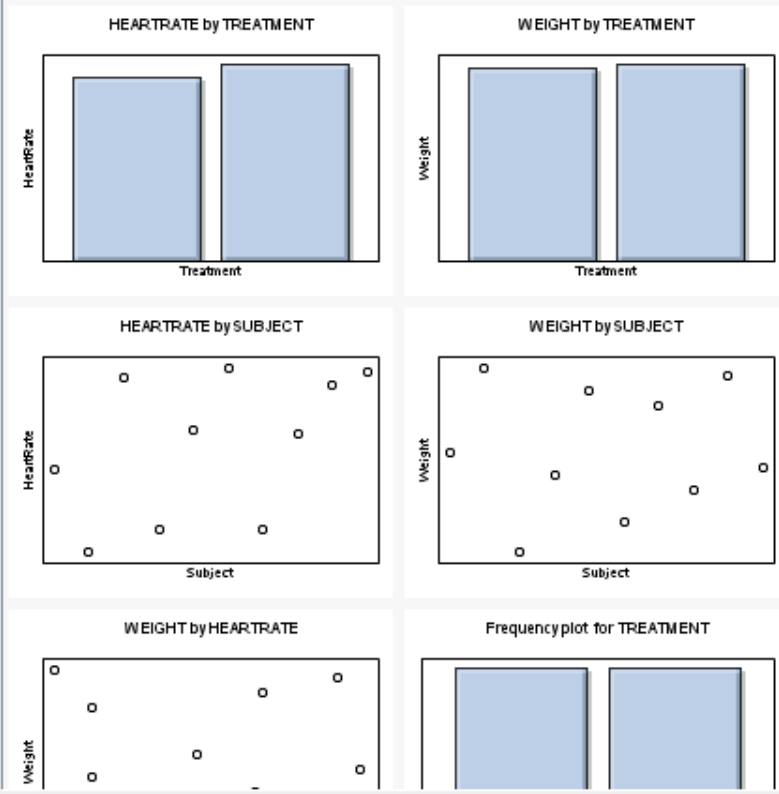
	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuou
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuou
☒	WEIGHT	67 - 91	Continuou

Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs

Open Save As Delete Delete All | 32 graphs (32 new)



Library: TEST

Data Set: VITALSIGNS (10 observations)

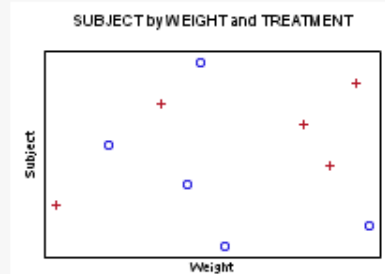
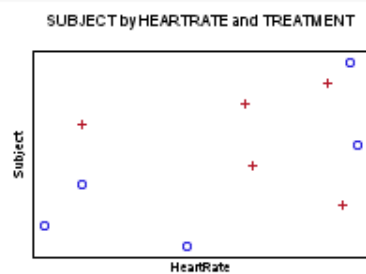
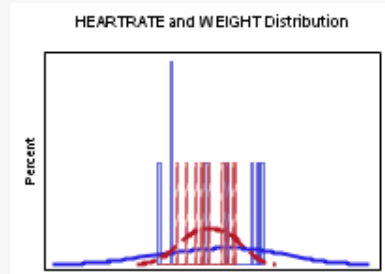
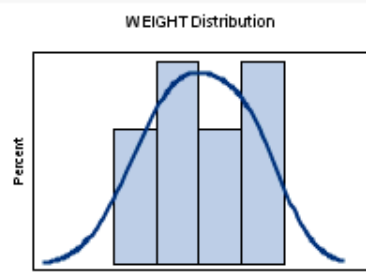
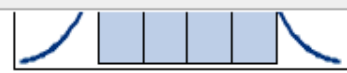
	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs

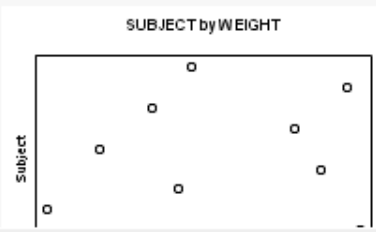
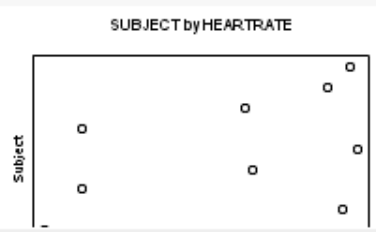
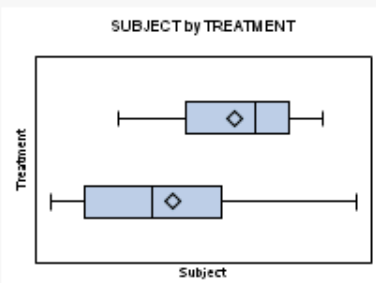
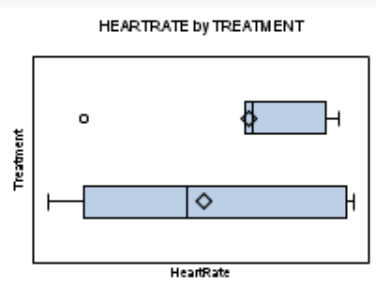
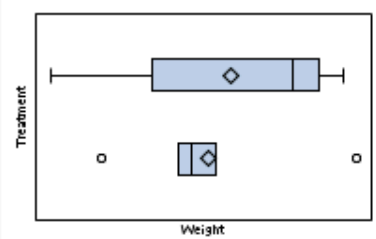
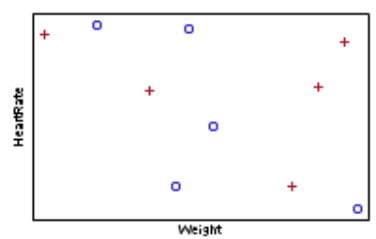
Open Save As Delete Delete All | 32 graphs (32 new)



Library: TEST Data Set: VITALSIGNS (10 observations)

	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

Open Save As Delete Delete All | 32 graphs (32 new)



Select graph types:

☒ Univariate ☒ Bivariate

☒ Grouped ☒ Advanced Plots

Generate Graphs

Library: TEST

Data Set: VITALSIGNS (10 observations)

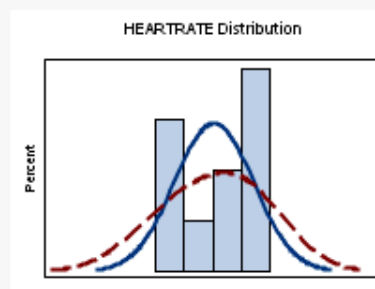
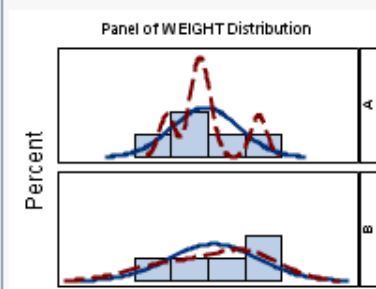
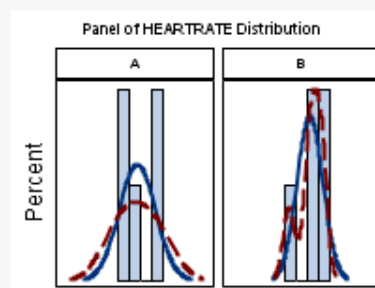
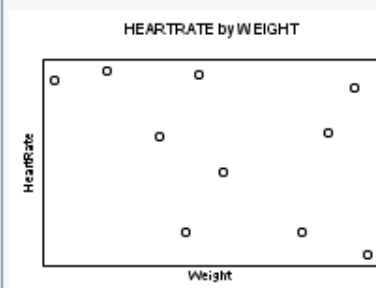
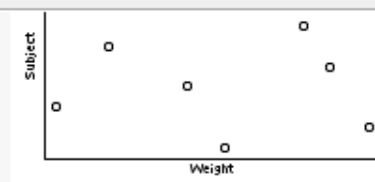
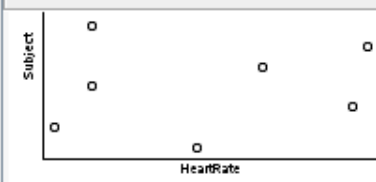
	Variable	Details	Type
☒	SUBJECT	1 - 10	Continuoy
☒	TREATMENT	2	Discrete
☒	HEARTRATE	60 - 102	Continuoy
☒	WEIGHT	67 - 91	Continuoy

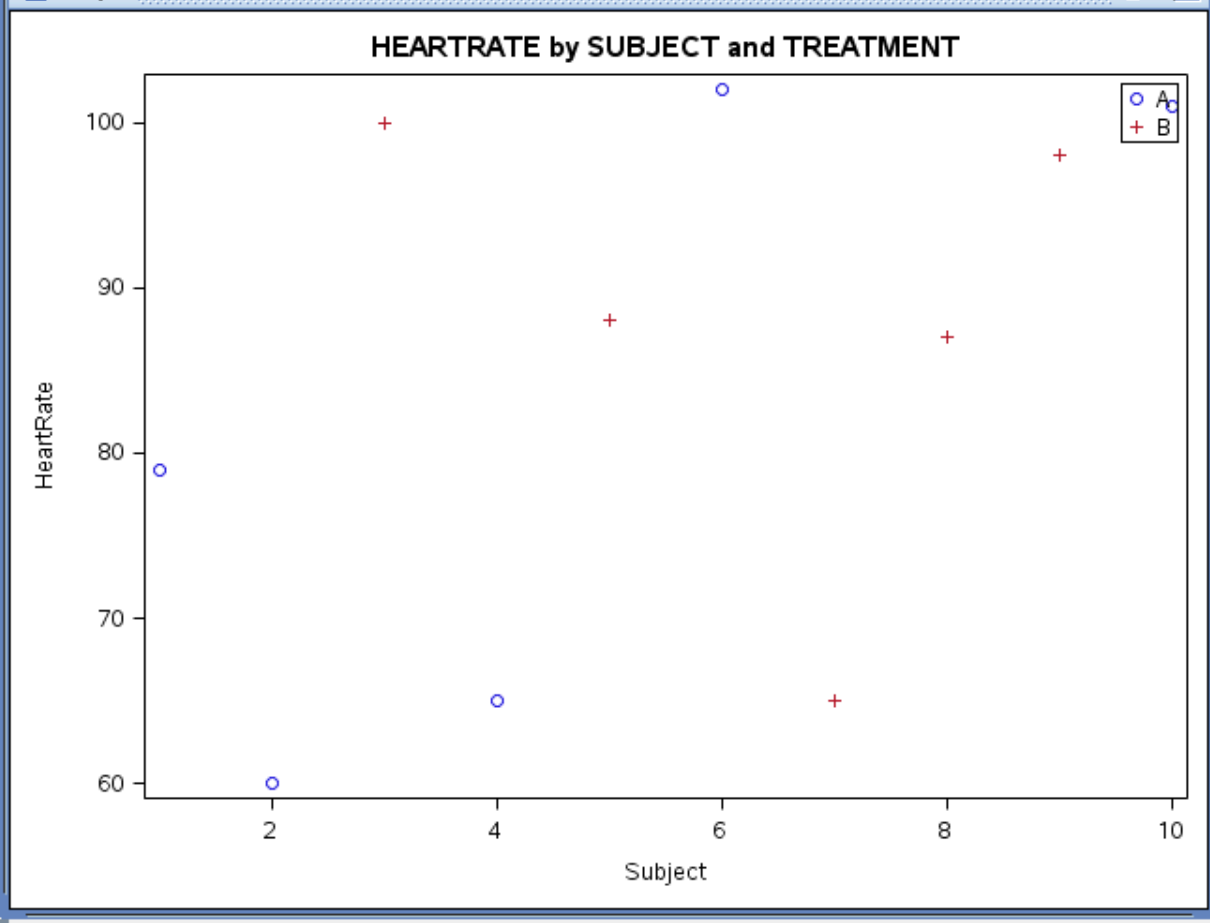
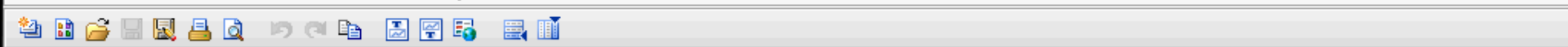
Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs

Open Save As Delete Delete All | 32 graphs (32 new)





32 graphs (32 new)

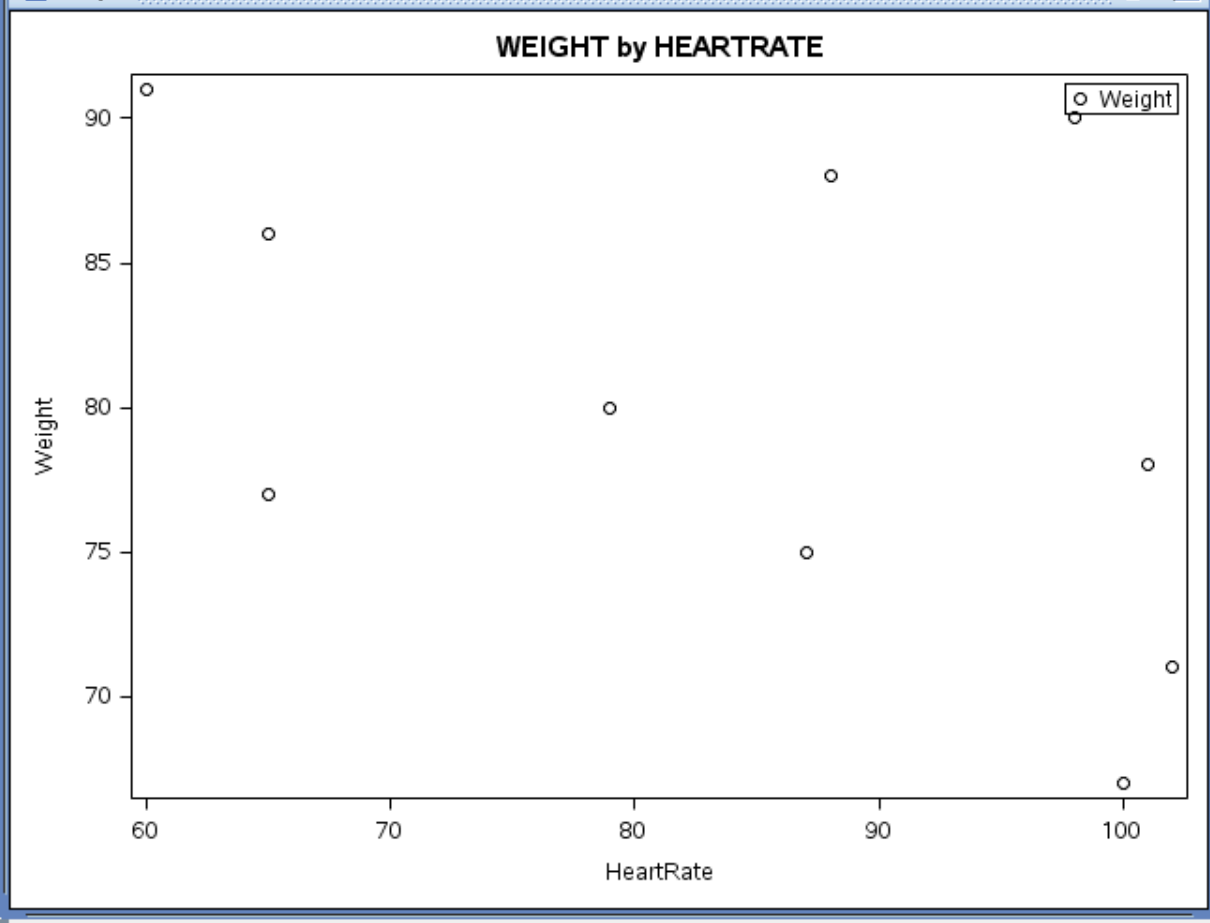
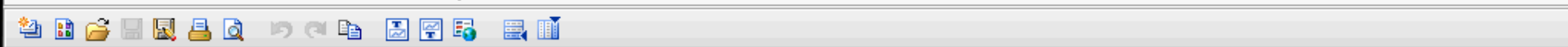
ect

T and TREATMENT

ect

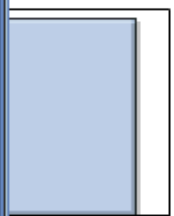
TREATMENT

ent

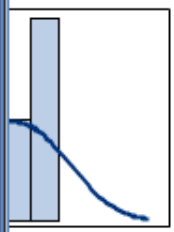


32 graphs (32 new)

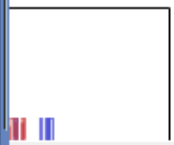
TREATMENT

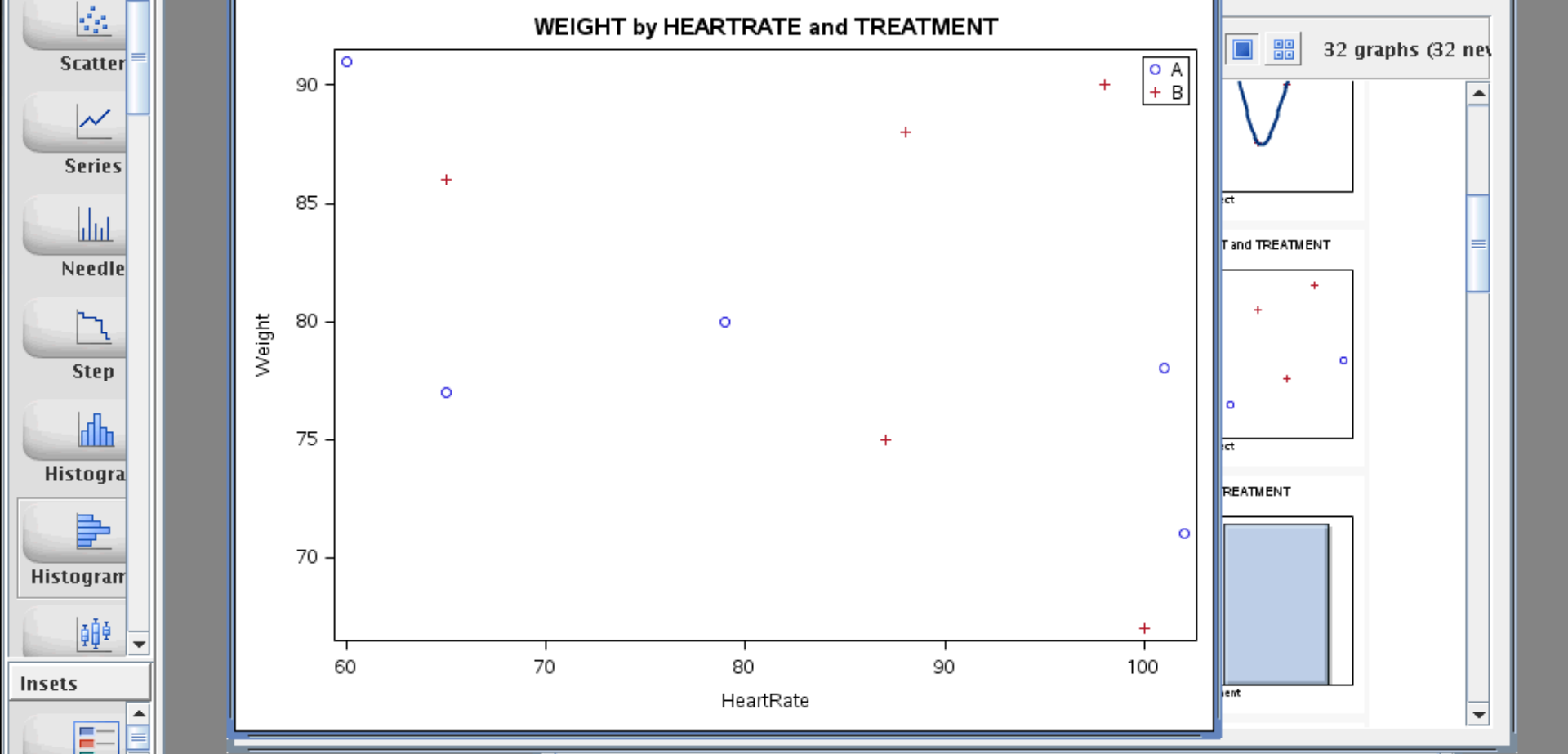


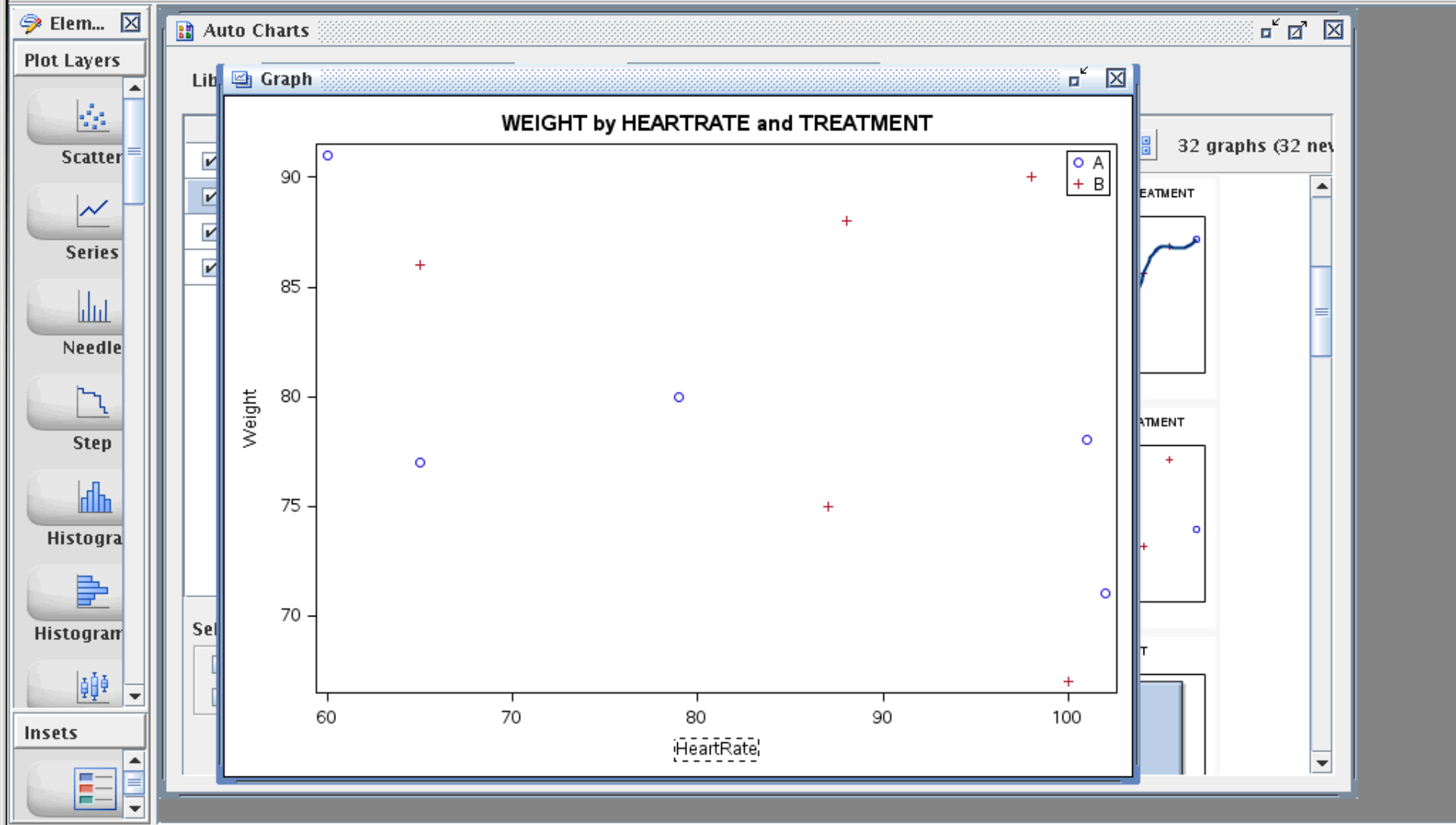
Distribution

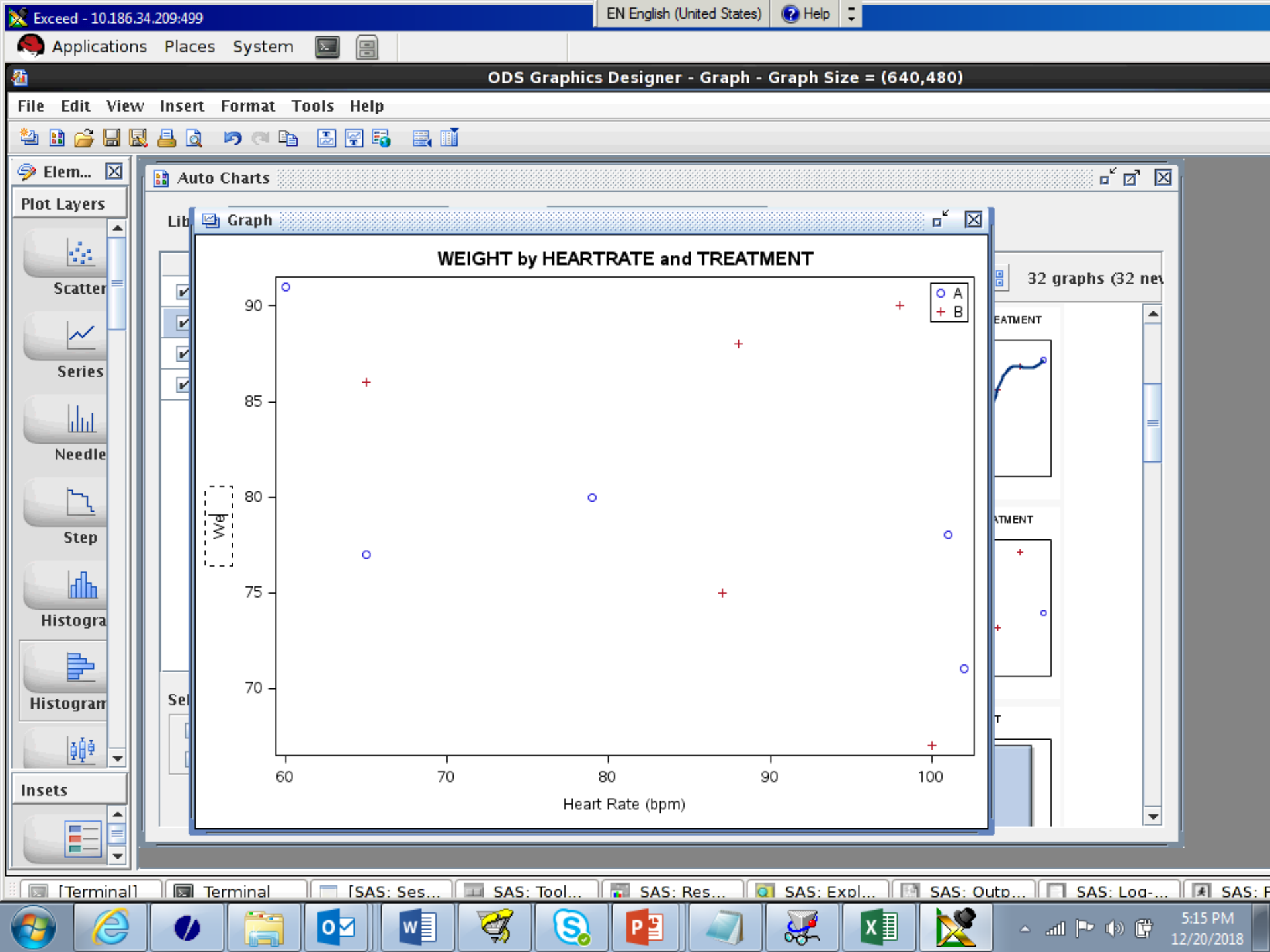


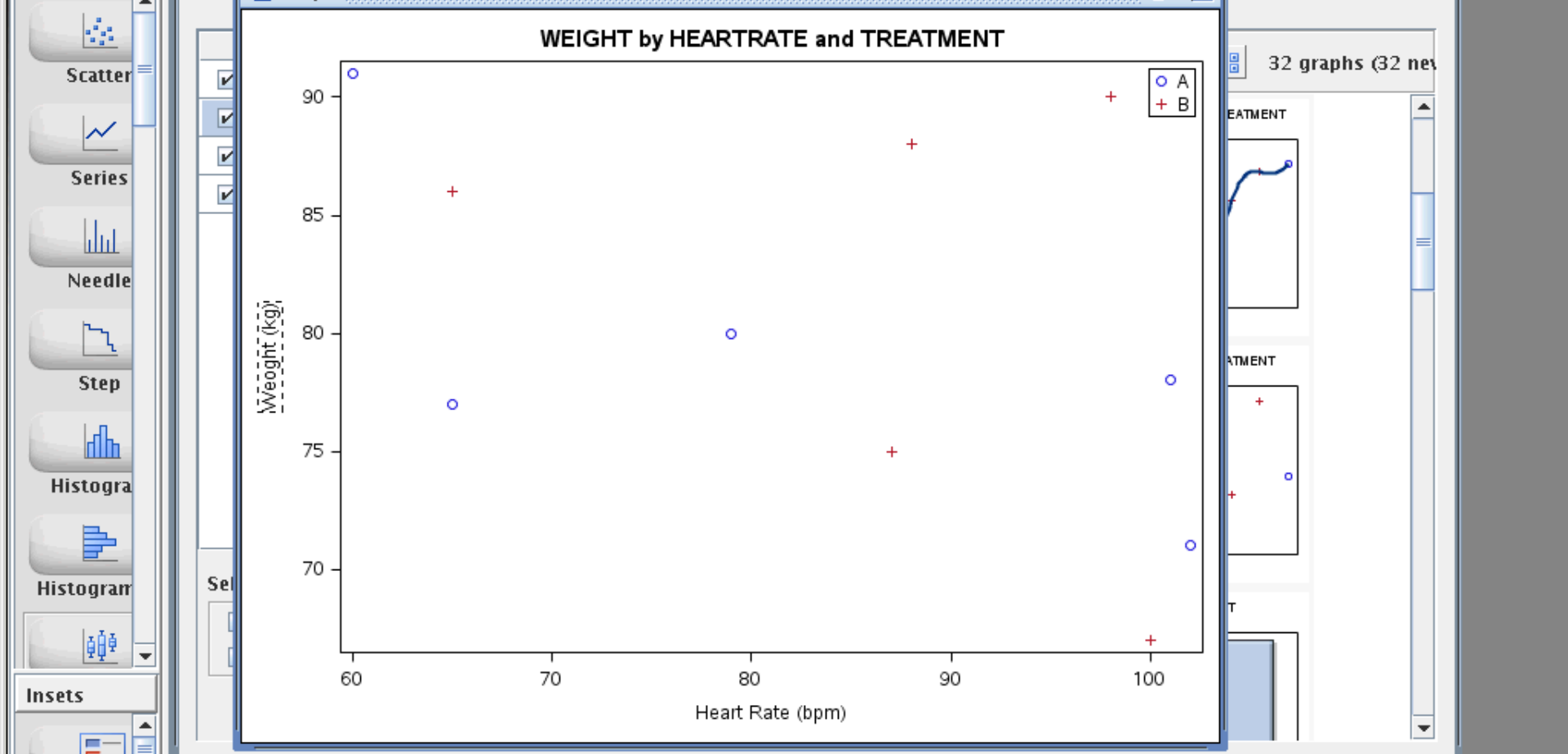
WEIGHT Distribution











ODS Graphics Designer - Code - Graph

File Edit View Insert Format Tools Help



Elem...

Code - Graph

Plot Layers

Scatter

Series

Needle

Step

Histogram

Histogram

Insets

```
proc template;
define statgraph sgdesign;
dynamic _HEARTRATE _WEIGHT _TREATMENT;
begingraph;
  entrytitle halign=center 'WEIGHT by HEARTRATE and TREATMENT';
  layout lattice / rowdatarange=data columndatarange=data rowgutter=10 columngutter=10;
  layout overlay / xaxisopts=( display=(TICKS TICKVALUES LINE LABEL ) label=('Heart Rate (bpm)') discreteopts=
tickvaluefitpolicy=splitrotate)) yaxisopts=( display=(TICKS TICKVALUES LINE LABEL ) label=('Weight (kg)') discrete
tickvaluefitpolicy=none));
  scatterplot x=_HEARTRATE y=_WEIGHT / group=_TREATMENT name='scatter';
  discretelegend 'scatter' / opaque=false border=true halign=right valign=top displayclipped=true across=1 o
location=inside;
  endlayout;
  endlayout;
endgraph;
end;
run;

proc sgrender data=TEST.VITALSIGNS template=sgdesign;
dynamic _HEARTRATE="HEARTRATE" _WEIGHT="WEIGHT" _TREATMENT="TREATMENT";
run;
```

File Edit View Insert Format Tools Help



Elem...

Plot Layers



Scatter



Series



Needle



Step



Histogram



Histogram



Insets

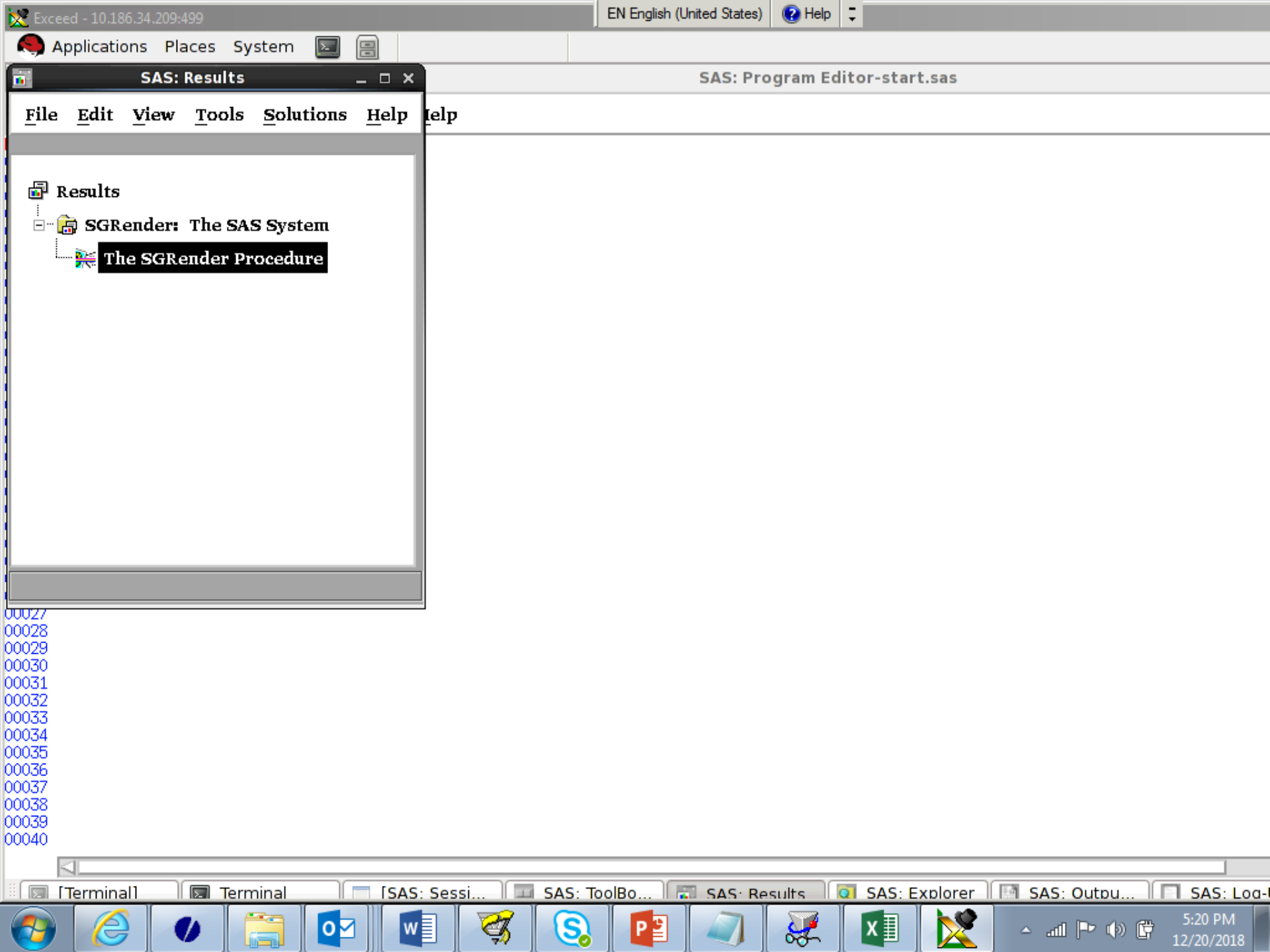
Code - Graph

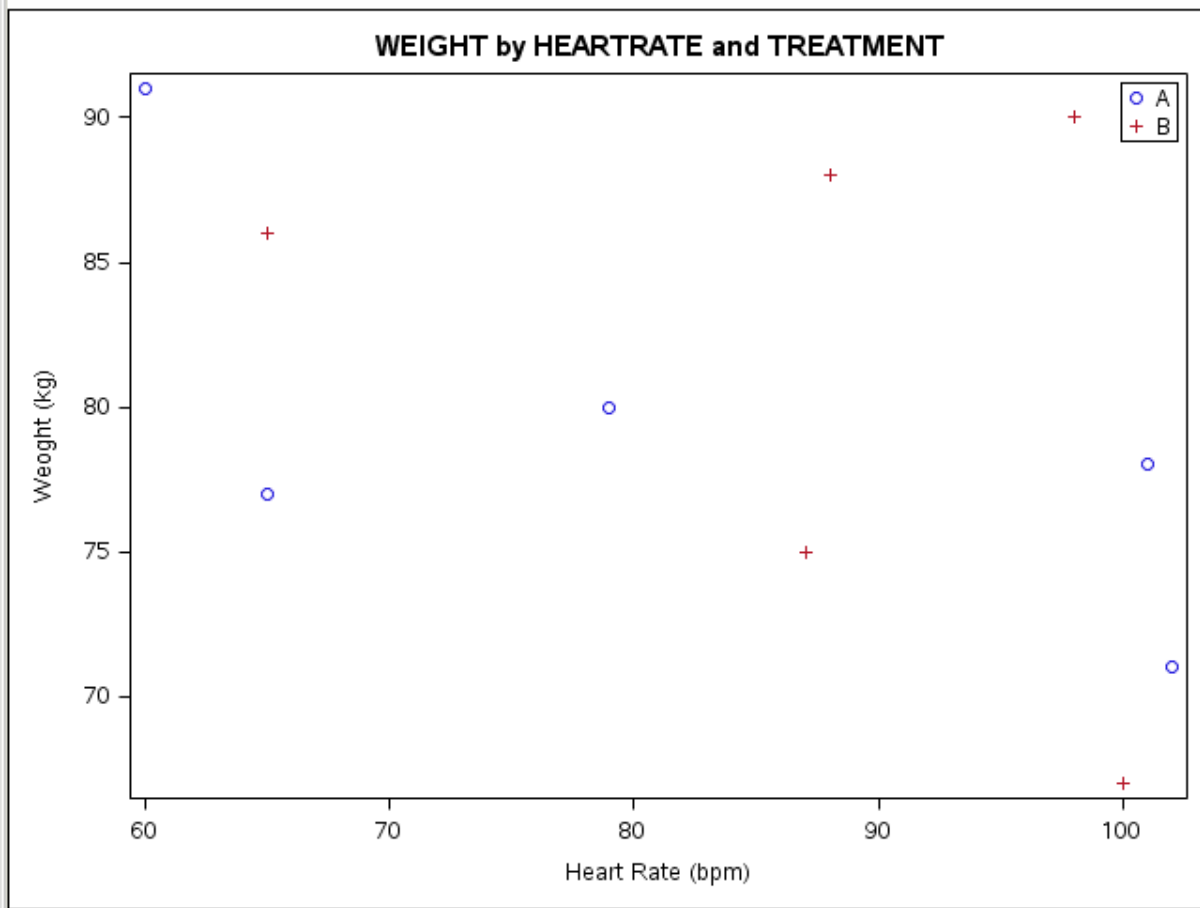
```
proc template;
define statgraph sgdesign;
dynamic _HEARTRATE _WEIGHT _TREATMENT;
begingraph;
  entrytitle halign=center 'WEIGHT by HEARTRATE and TREATMENT';
  layout lattice / rowdatarange=data columndatarange=data rowgutter=10 columngutter=10;
  layout overlay / xaxisopts=( display=(TICKS TICKVALUES LINE LABEL ) label=('Heart Rate (bpm)') discreteopts=
tickvaluefitpolicy=splitrotate) yaxisopts=( display=(TICKS TICKVALUES LINE LABEL ) label=('Weight (kg)') discrete
tickvaluefitpolicy=none));
  scatterplot x=_HEARTRATE y=_WEIGHT / group=_TREATMENT name='scatter';
  discretelegend 'scatter' / opaque=false border=true halign=right valign=top displayclipped=true across=1 a
location=inside;
  endlayout;
  endlayout;
endgraph;
end;
run;

proc sgrender data=TEST.VITALSIGNS template=sgdesign;
dynamic _HEARTRATE="HEARTRATE" _WEIGHT="WEIGHT" _TREATMENT="TREATMENT";
run;
```

File Edit View Tools Run Solutions Help

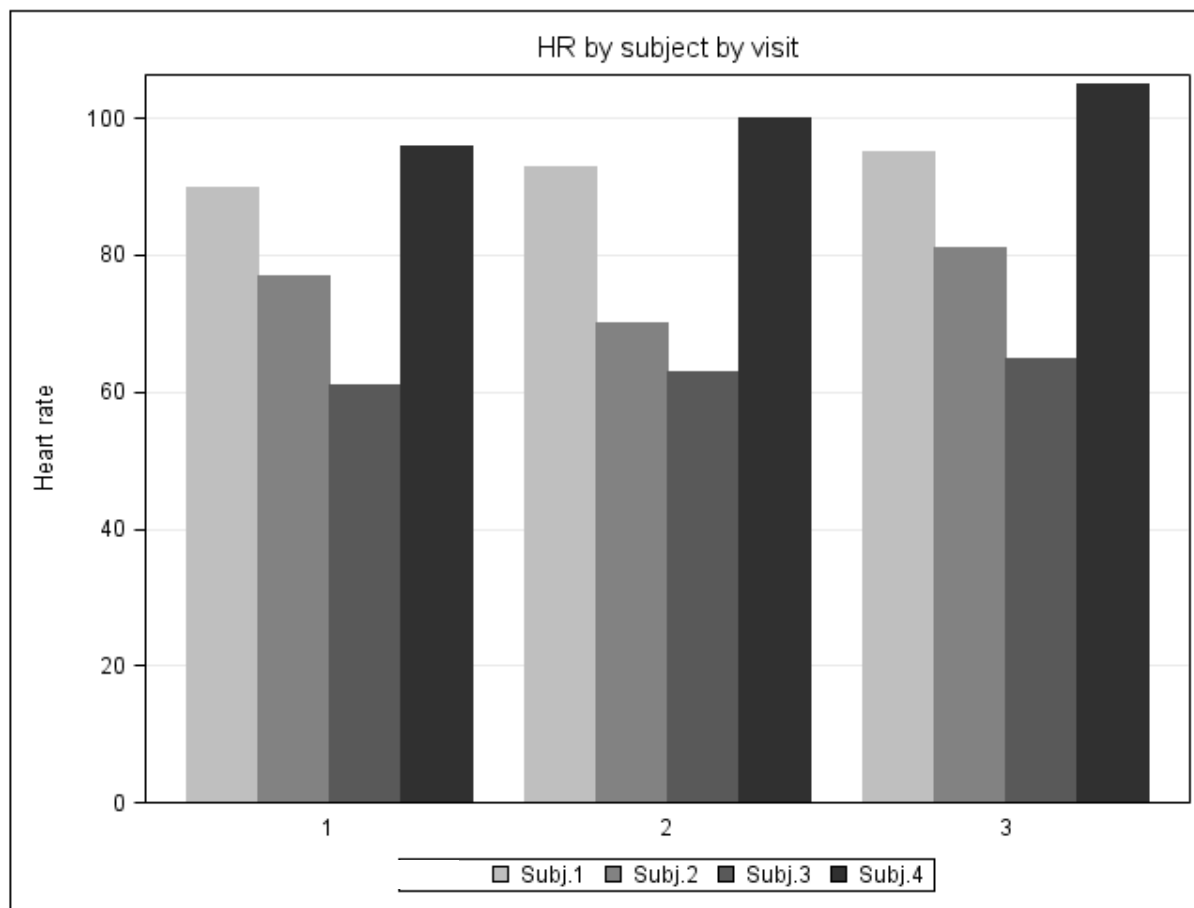
```
00001
00002 proc template;
00003 define statgraph sgdesign;
00004 dynamic _HEARTRATE _WEIGHT _TREATMENT;
00005 begingraph;
00006   entrytitle halign=center 'WEIGHT by HEARTRATE and TREATMENT';
00007   layout lattice / rowdatarange=data columndatarange=data rowgutter=10 columngutter=10;
00008     layout overlay / xaxisopts=( display=(TICKS TICKVALUES LINE LABEL ) label=('Heart Rate (bpm)') discreteopts=( tickvaluefitpolicy=split
00009       scatterplot x=_HEARTRATE y=_WEIGHT / group=_TREATMENT name='scatter';
00010       discretelegend 'scatter' / opaque=false border=true halign=right valign=top displayclipped=true across=1 order=rowmajor location=in
00011     endlayout;
00012   endlayout;
00013 endgraph;
00014 end;
00015 run;
00016
00017 proc sgrender data=TEST.VITALSIGNS template=sgdesign;
00018 dynamic _HEARTRATE="HEARTRATE" _WEIGHT="WEIGHT" _TREATMENT="TREATMENT";
00019 run;
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```





Example 2: Vertical bar chart

Required graph:



Example 2: Vertical bar chart



Input dataset contains heart rate per subject per visit:

Subject (Subject)	Visit (Visit)	HeartRate (HeartRate)
Subj.1	1	90
Subj.1	2	93
Subj.1	3	95
Subj.2	1	77
Subj.2	2	70
Subj.2	3	81
Subj.3	1	61
Subj.3	2	63
Subj.3	3	65
Subj.4	1	96
Subj.4	2	100
Subj.4	3	105

Library: TEST Data Set: HEARTRATEBYVISIT (12 observations)

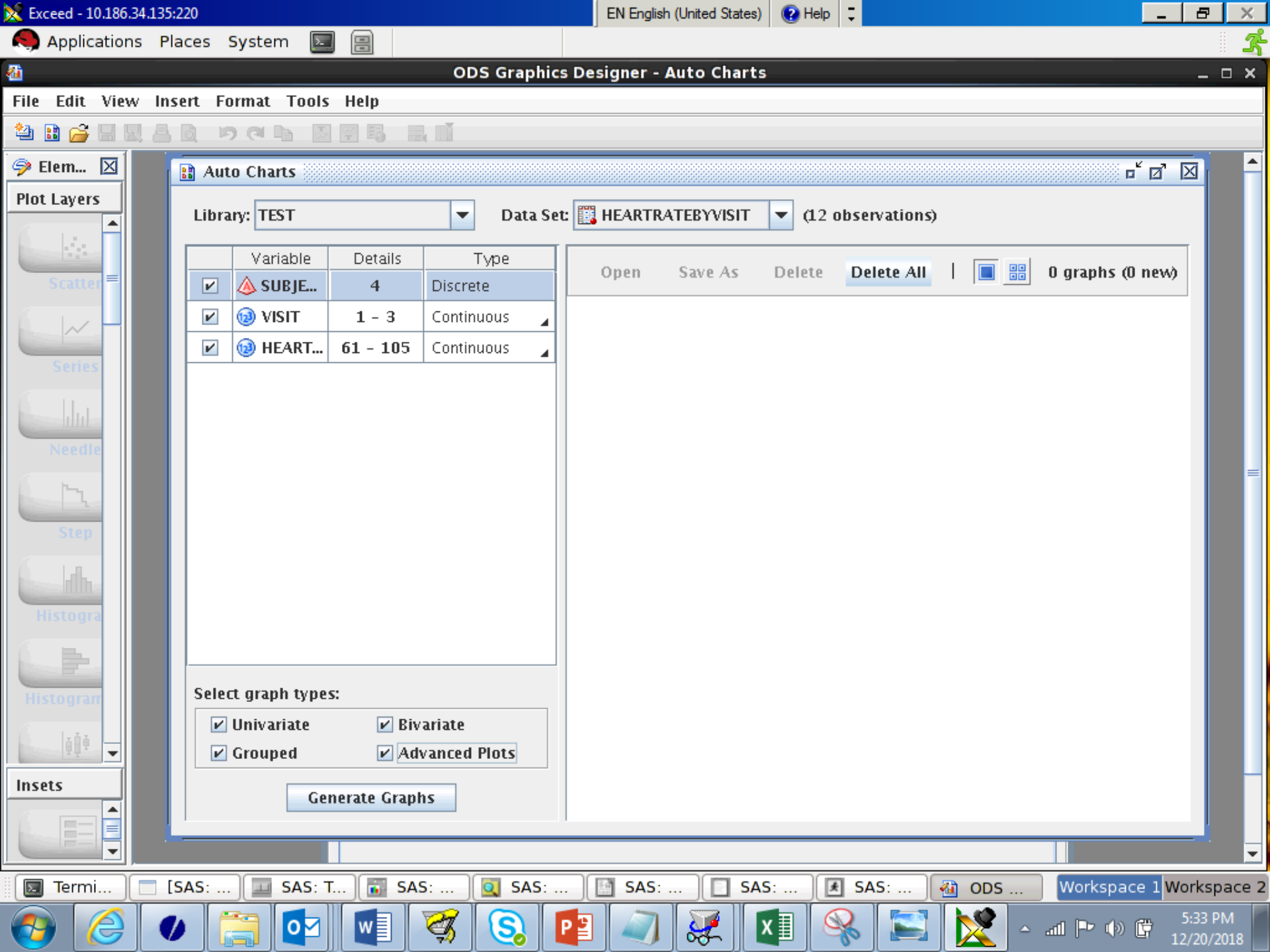
	Variable	Details	Type
☐	▲ SUBJE...	4	Discrete
☐	⑬ VISIT	1 - 3	Continuous
☐	⑬ HEART...	61 - 105	Continuous

Open Save As Delete Delete All | 0 graphs (0 new)

Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☐ Grouped
- ☐ Advanced Plots

Generate Graphs



Library: TEST Data Set: HEARTRATEBYVISIT (12 observations)

	Variable	Details	Type
☒	SUBJE...	4	Discrete
☒	VISIT	1 - 3	Continuous
☒	HEART...	61 - 105	Any
			Continuous
			Discrete

Open Save As Delete Delete All | 0 graphs (0 new)

Select graph types:

- ☒ Univariate ☒ Bivariate
- ☒ Grouped ☒ Advanced Plots

Generate Graphs

Library: TEST Data Set: HEARTRATEBYVISIT (12 observations)

	Variable	Details	Type
☒	SUBJE...	4	Discrete
☒	VISIT	3	Discrete
☒	HEART...	61 - 105	Continuous

Open Save As Delete Delete All | 0 graphs (0 new)

Select graph types:

- ☒ Univariate ☒ Bivariate
- ☒ Grouped ☒ Advanced Plots

Generate Graphs

Library: TEST Data Set: HEARTRATEBYVISIT (12 observations)

	Variable	Details	Type
☒	SUBJE...	4	Discrete
☒	VISIT	3	Discrete
☒	HEART...	61 - 105	Continuous
			Any
			Continuous
			Discrete

Open Save As Delete Delete All | 0 graphs (0 new)

Select graph types:

- ☒ Univariate ☒ Bivariate
- ☒ Grouped ☒ Advanced Plots

Generate Graphs

Library: TEST Data Set: HEARTRATEBYVISIT (12 observations)

	Variable	Details	Type
☒	SUBJE...	4	Discrete
☒	VISIT	3	Discrete
☒	HEART...	12, 61 - ...	Any

Open Save As Delete Delete All | 0 graphs (0 new)

Select graph types:

- ☒ Univariate ☒ Bivariate
- ☒ Grouped ☒ Advanced Plots

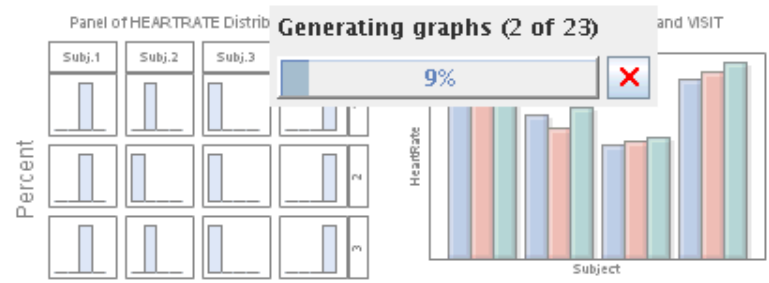
Generate Graphs

Library: TEST

Data Set: HEARTRATEBYVISIT (12 observations)

	Variable	Details	Type
☒	SUBJE...	4	Discrete
☒	VISIT	3	Discrete
☒	HEART...	12, 61 - ...	Any

Open Save As Delete Delete All | 0 graphs (0 new)



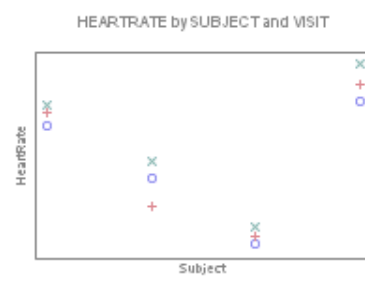
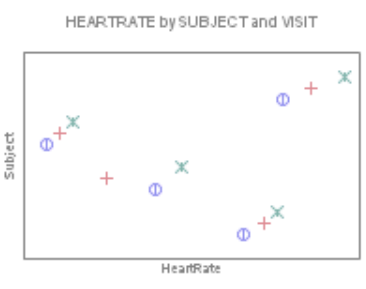
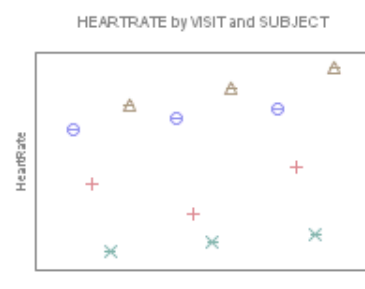
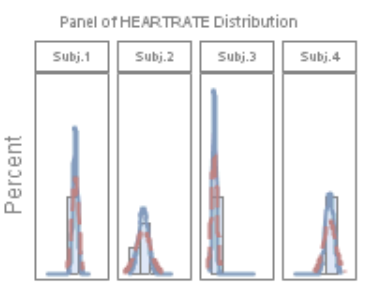
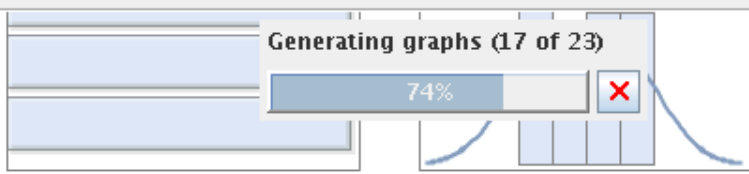
Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs

	Variable	Details	Type
☒	SUBJE...	4	Discrete
☒	VISIT	3	Discrete
☒	HEART...	12, 61 - ...	Any

Open Save As Delete Delete All | 0 graphs (0 new)



Select graph types:

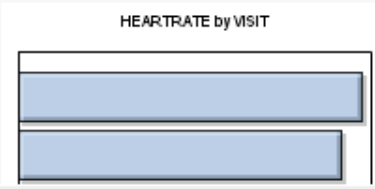
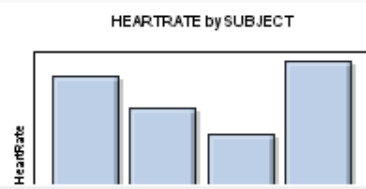
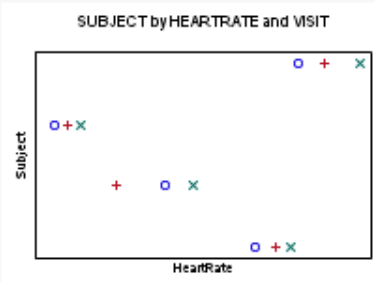
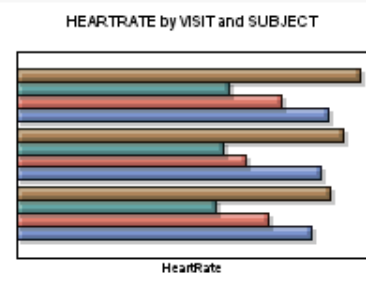
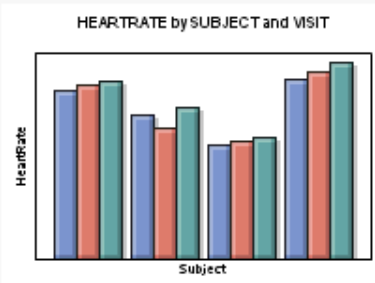
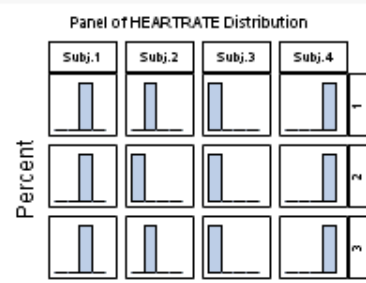
☒ Univariate ☒ Bivariate

☒ Grouped ☒ Advanced Plots

Generate Graphs

	Variable	Details	Type
☒	△ SUBJE...	4	Discrete
☒	⑫ VISIT	3	Discrete
☒	⑫ HEART...	12, 61 - ...	Any

Open Save As Delete Delete All | 23 graphs (23 new)



Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

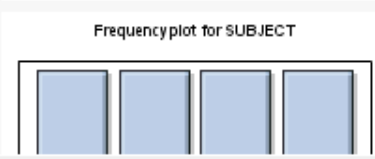
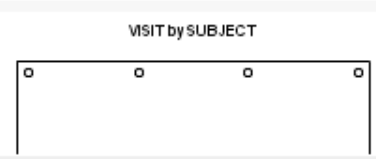
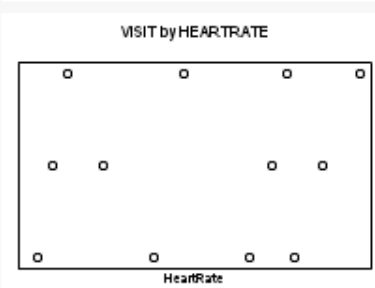
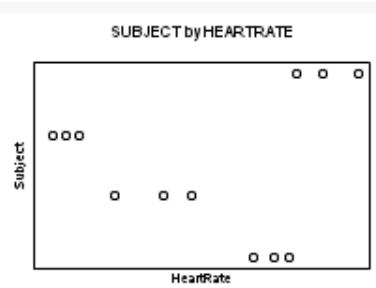
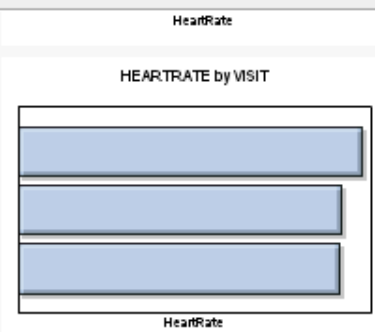
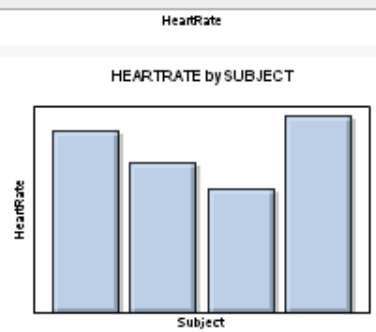
Generate Graphs

Library: TEST

Data Set: HEARTRATEBYVISIT (12 observations)

	Variable	Details	Type
☒	SUBJE...	4	Discrete
☒	VISIT	3	Discrete
☒	HEART...	12, 61 - ...	Any

Open Save As Delete Delete All | 23 graphs (23 new)



Select graph types:

- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

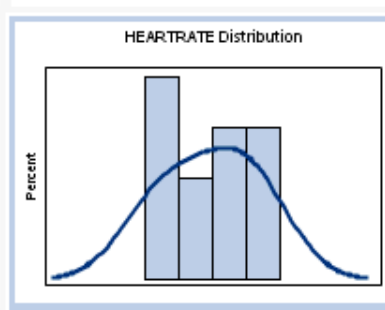
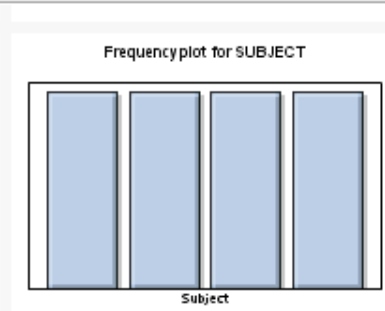
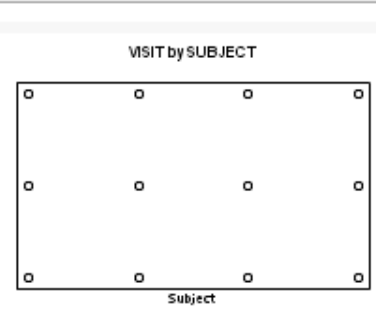
Generate Graphs

Library: TEST

Data Set: HEARTRATEBYVISIT (12 observations)

	Variable	Details	Type
☒	SUBJE...	4	Discrete
☒	VISIT	3	Discrete
☒	HEART...	12, 61 - ...	Any

Open Save As Delete Delete All | 23 graphs (23 new)

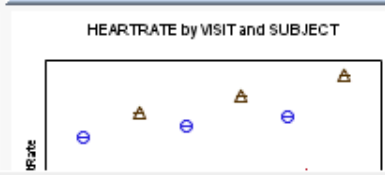
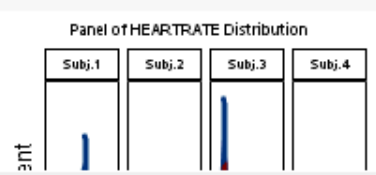


Select graph types:

☒ Univariate ☒ Bivariate

☒ Grouped ☒ Advanced Plots

Generate Graphs

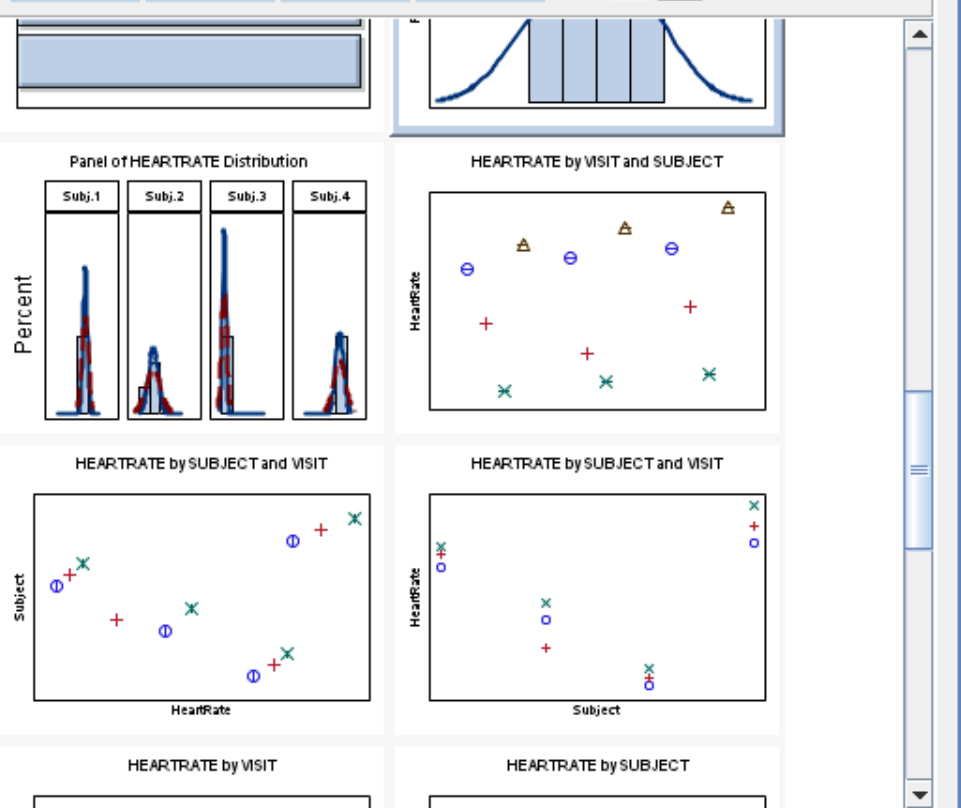


Library: TEST

Data Set: HEARTRATEBYVISIT (12 observations)

	Variable	Details	Type
☒	SUBJE...	4	Discrete
☒	VISIT	3	Discrete
☒	HEART...	12, 61 - ...	Any

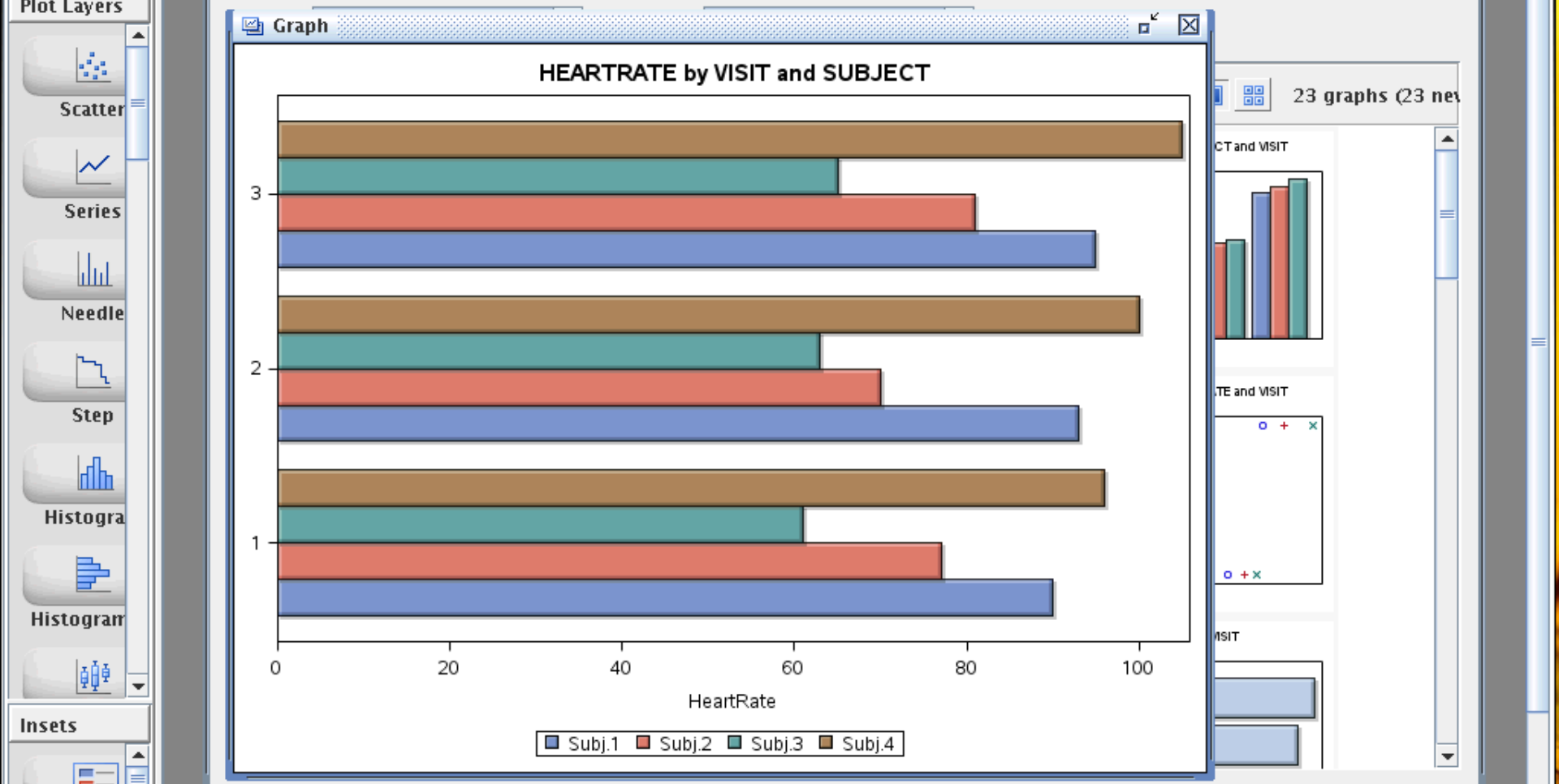
Open Save As Delete Delete All | 23 graphs (23 new)

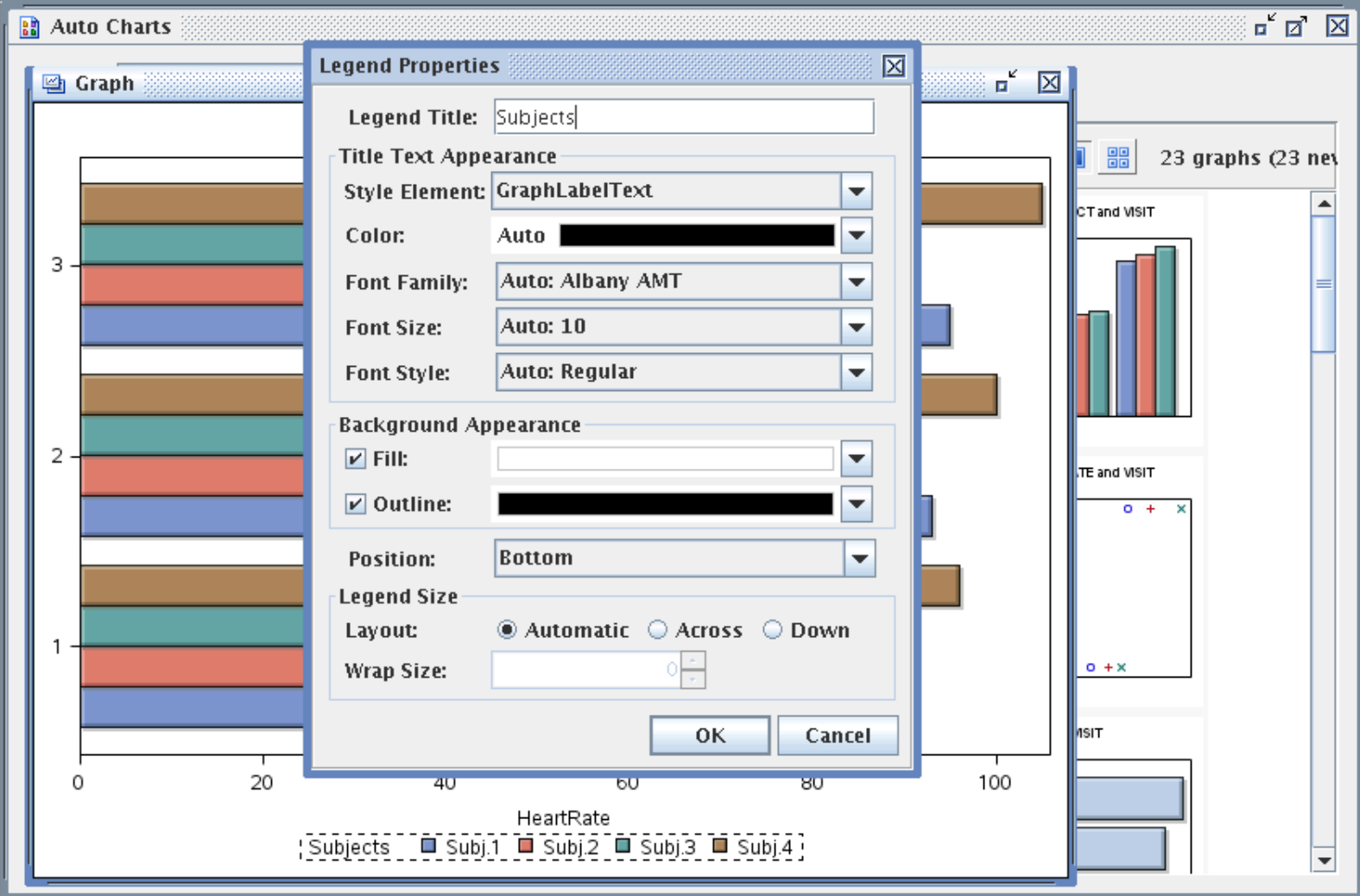
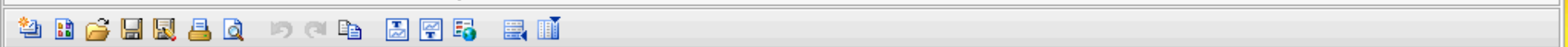


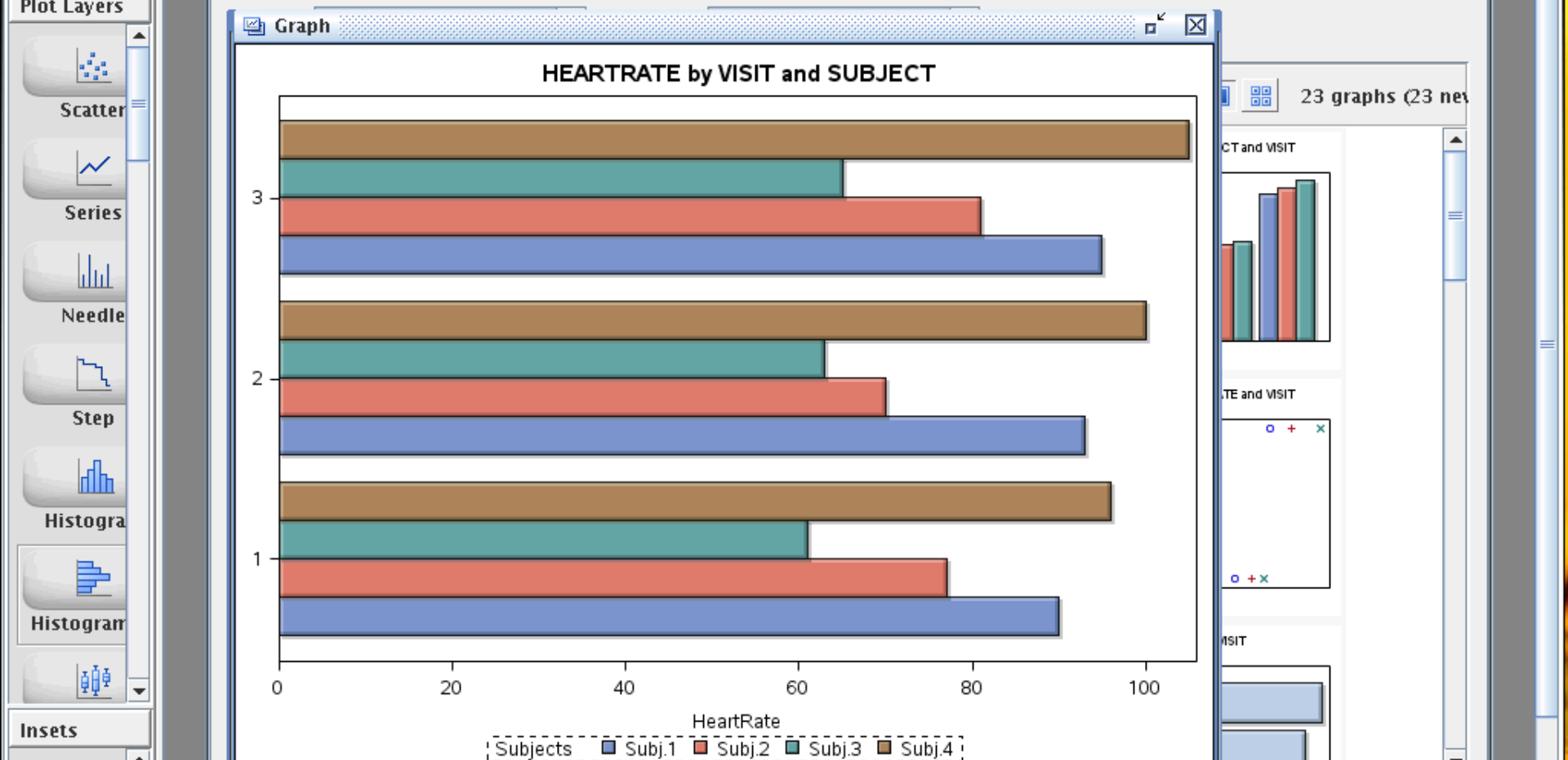
Select graph types:

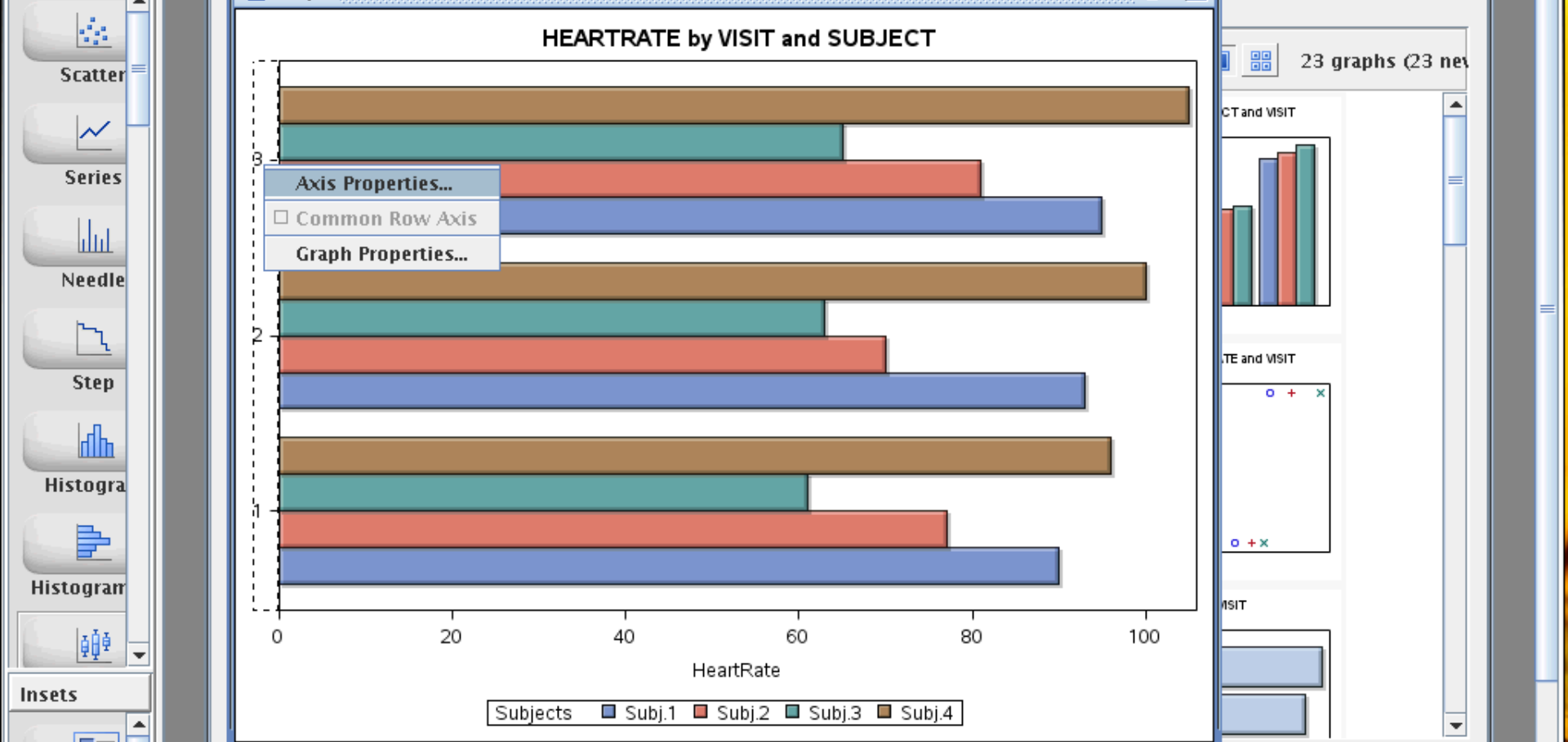
- ☒ Univariate
- ☒ Bivariate
- ☒ Grouped
- ☒ Advanced Plots

Generate Graphs









Cell Properties

General Plots Axes

Axis: Y

Type: Discrete

☒ Label ☒ Value ☐ Grid ☒ Tick

General Label Value Grid Range

Label: Visit

Offset: Min: * Max: *

☐ Minor Ticks

☐ Reverse

☐ Discrete Color Bands

☐ Even ☐ Odd

Element: GraphBlock

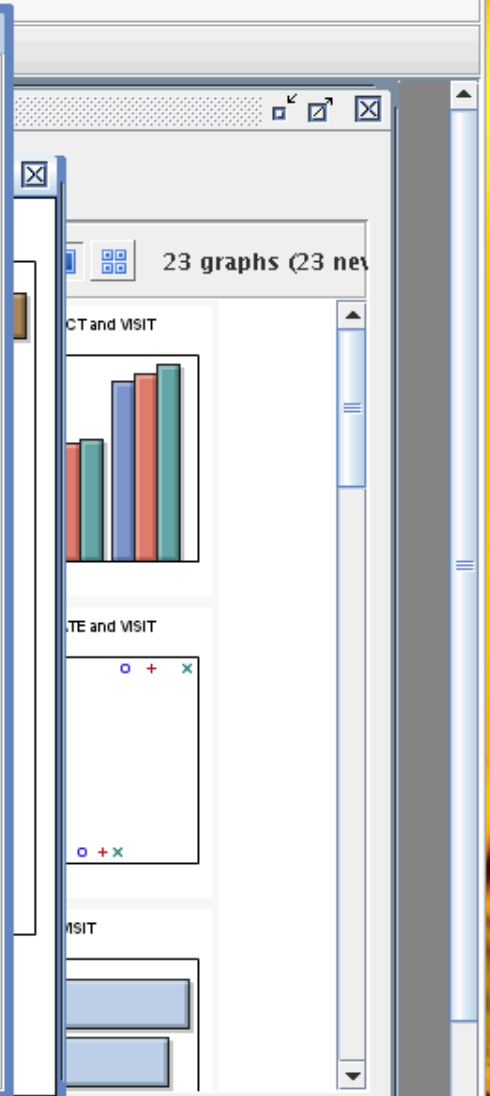
Color: Auto

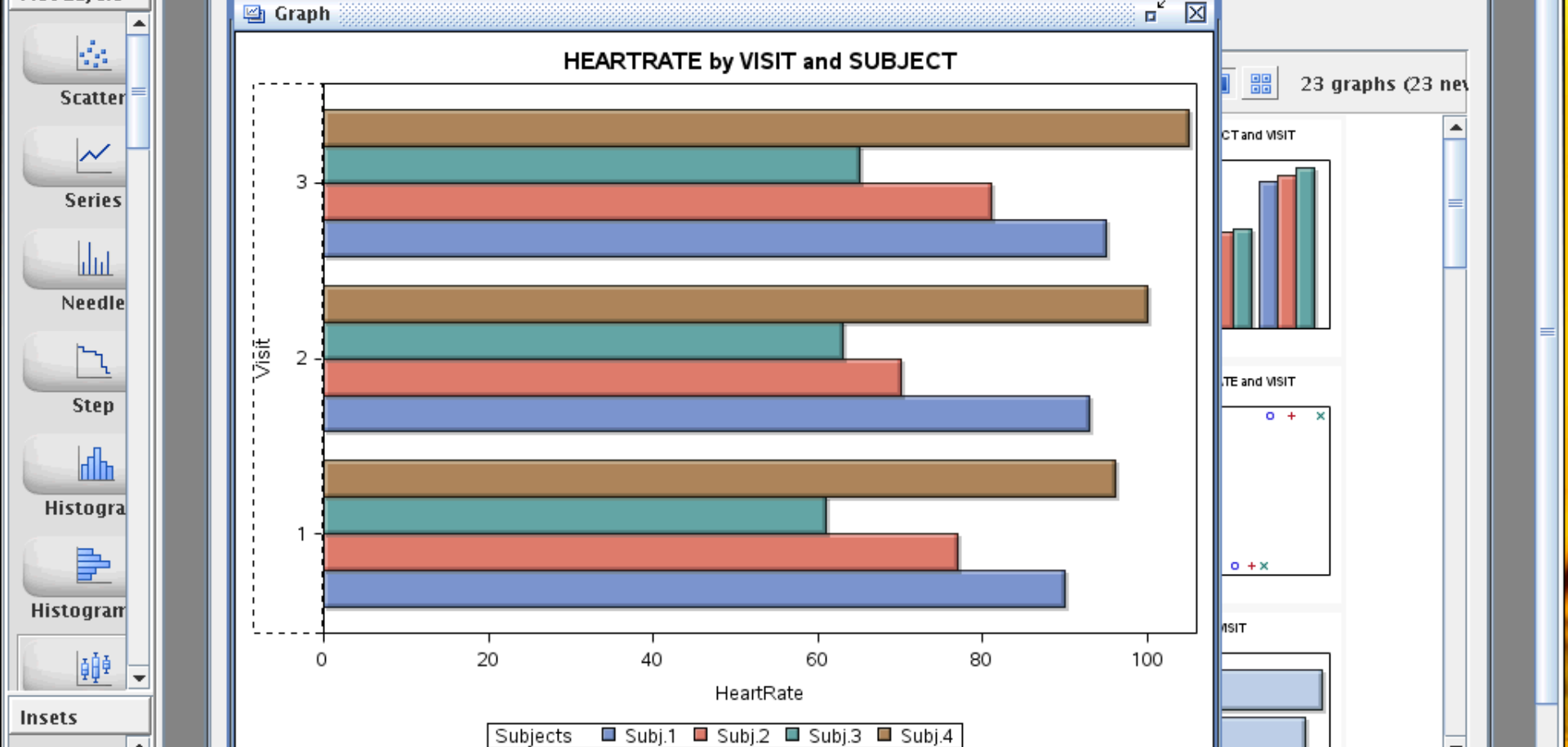
Transparency: 0%

Tick Value: Fit Policy: None

Data Range: Data

OK Cancel





Exceed - 10.186.34.135:220 EN English (United States) ? Help

Applications Places System

ODS Graphics Designer - Code - Graph

File Edit View Insert Format Tools Help

Elem... Plot Layers

Scatter

Series

Needle

Step

Histogram

Histogram

Insets

```
proc template;
define statgraph sgdesign;
dynamic _VISIT _HEARTRATE _SUBJECT;
begingraph / dataskin=CRISP;
  entrytitle halign=center 'HEARTRATE by VISIT and SUBJECT';
  layout lattice / rowdatarange=data columndatarange=data rowgutter=10 columngutter=10;
  layout overlay / xaxisopts=( display=(TICKS TICKVALUES LINE LABEL ) discreteopts=(
tickvaluefitpolicy=splitrotate)) yaxisopts=( display=(TICKS TICKVALUES LINE LABEL ) discreteopts=(
tickvaluefitpolicy=none));
  barchart category=_VISIT response=_HEARTRATE / group=_SUBJECT name='bar(h)' stat=mean
orient=horizontal groupdisplay=Cluster;
endlayout;
  sidebar / align=bottom spacefill=false;
  discretelegend 'bar(h)' / opaque=true border=true halign=center valign=center title='Subjects'
displayclipped=true order=rowmajor;
endsidebar;
endlayout;
endgraph;
end;
run;

proc sgrender data=TEST.HEARTRATEBYVISIT template=sgdesign;
dynamic _VISIT="VISIT" _HEARTRATE="HEARTRATE" _SUBJECT="SUBJECT";
run;
```

Termi... [SAS: ... SAS: T... SAS: ... SAS: ... SAS: ... SAS: ... SAS: ... ODS ... Workspace 1 Workspace 2

5:43 PM 12/20/2018

```
proc template;
define statgraph sgdesign;
dynamic _VISIT _HEARTRATE _SUBJECT;
begingraph / dataskin=CRISP;
  entrytitle halign=center 'HEARTRATE by VISIT and SUBJECT';
  layout lattice / rowdatarange=data columndatarange=data rowgutter=10 columngutter=10;
  layout overlay / xaxisopts=( display=(TICKS TICKVALUES LINE LABEL ) discreteopts=(
tickvaluefitpolicy=splitrotate)) yaxisopts=( display=(TICKS TICKVALUES LINE LABEL )
discreteopts=( tickvaluefitpolicy=none));
  barchart category=_VISIT response=_HEARTRATE / group=_SUBJECT name='bar(h)'
stat=mean orient=horizontal groupdisplay=cluster;
  endlayout;
  sidebar / align=bottom spacefill=false;
  discretelegend 'bar(h)' / opaque=true border=true halign=center valign=center
title='Subjects' displayclipped=true order=rowmajor;
  endsidebar;
  endlayout;
endgraph;
end;
run;

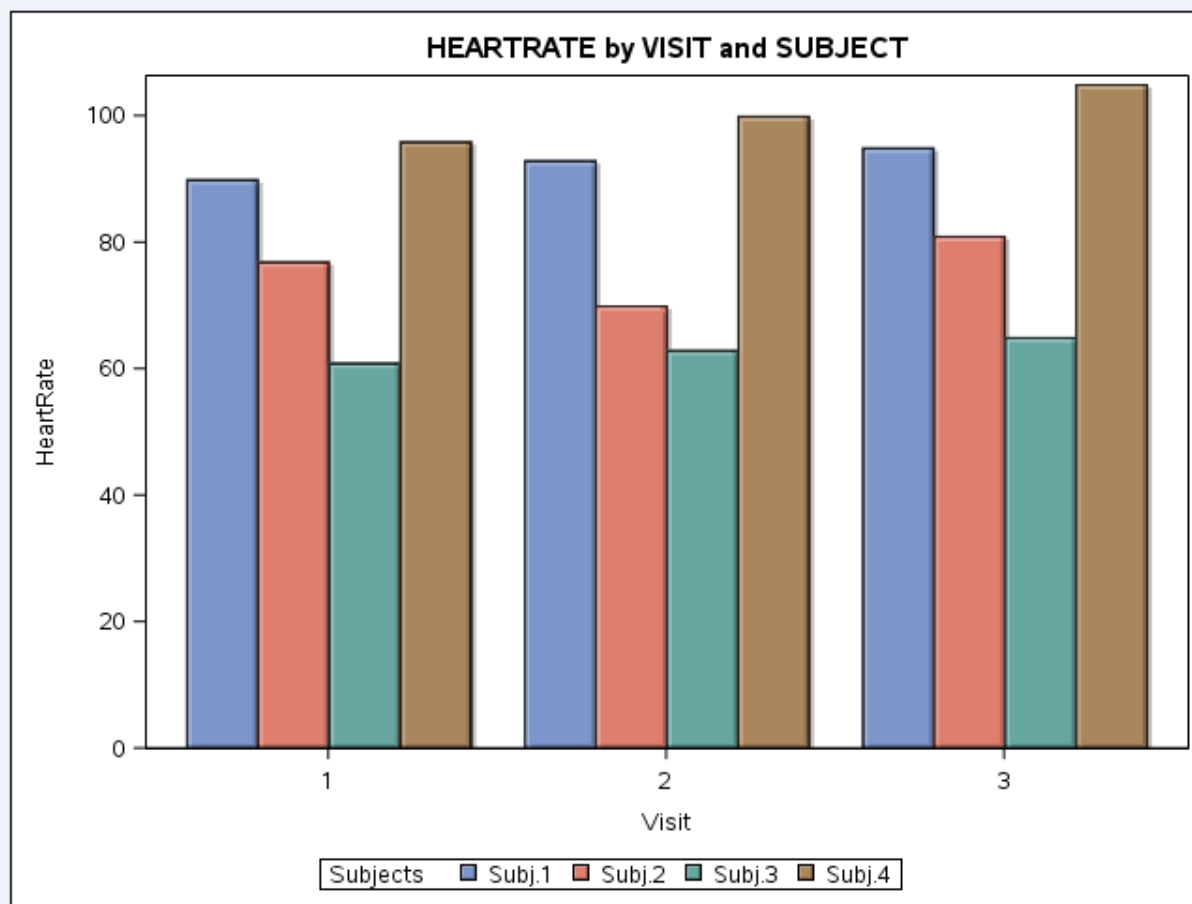
proc sgrender data=TEST.HEARTRATEBYVISIT template=sgdesign;
dynamic _VISIT="VISIT" _HEARTRATE="HEARTRATE" _SUBJECT="SUBJECT";
run;
```



```
proc template;
define statgraph sgdesign;
dynamic _VISIT _HEARTRATE _SUBJECT;
begingraph / dataskin=CRISP;
  entrytitle halign=center 'HEARTRATE by VISIT and SUBJECT';
  layout lattice / rowdatarange=data columndatarange=data rowgutter=10 columngutter=10;
  layout overlay / xaxisopts=( display=(TICKS TICKVALUES LINE LABEL ) discreteopts=(
tickvaluefitpolicy=splitrotate)) yaxisopts=( display=(TICKS TICKVALUES LINE LABEL )
discreteopts=( tickvaluefitpolicy=none));
  barchart category=_VISIT response=_HEARTRATE / group=_SUBJECT name='bar(h)'
stat=mean orient=vertical groupdisplay=cluster;
  endlayout;
  sidebar / align=bottom spacefill=false;
  discretelegend 'bar(h)' / opaque=true border=true halign=center valign=center
title='Subjects' displayclipped=true order=rowmajor;
  endsidebar;
  endlayout;
endgraph;
end;
run;

proc sgrender data=TEST.HEARTRATEBYVISIT template=sgdesign;
dynamic _VISIT="VISIT" _HEARTRATE="HEARTRATE" _SUBJECT="SUBJECT";
run;
```





- Excellent tool for SAS users at any experience level to generate various graphs for data exploration or learning ODS/GTL
- Automatic generation of all possible combinations of graphs is the main advantage over other similar SAS products (e.g. Enterprise Guide, SAS Studio, SAS ODS designer, Graph-N-G and SAS Assist)

Questions?