Chapter 41
SAS/INSIGHT Statements

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Chapter 41
SAS/INSIGHT Statements

You can submit SAS/INSIGHT statements to create graphs and analyses automatically. This saves time when you have repetitive analyses to perform or when you work with large data sets.

SAS/INSIGHT statements also provide a record of the analyses you create, including model equations. You can store statements in a text file or in the SAS log.

Included in this release are the new WINDOW statement, the OTHER= option, the MARKERSIZE= option, and axis options.
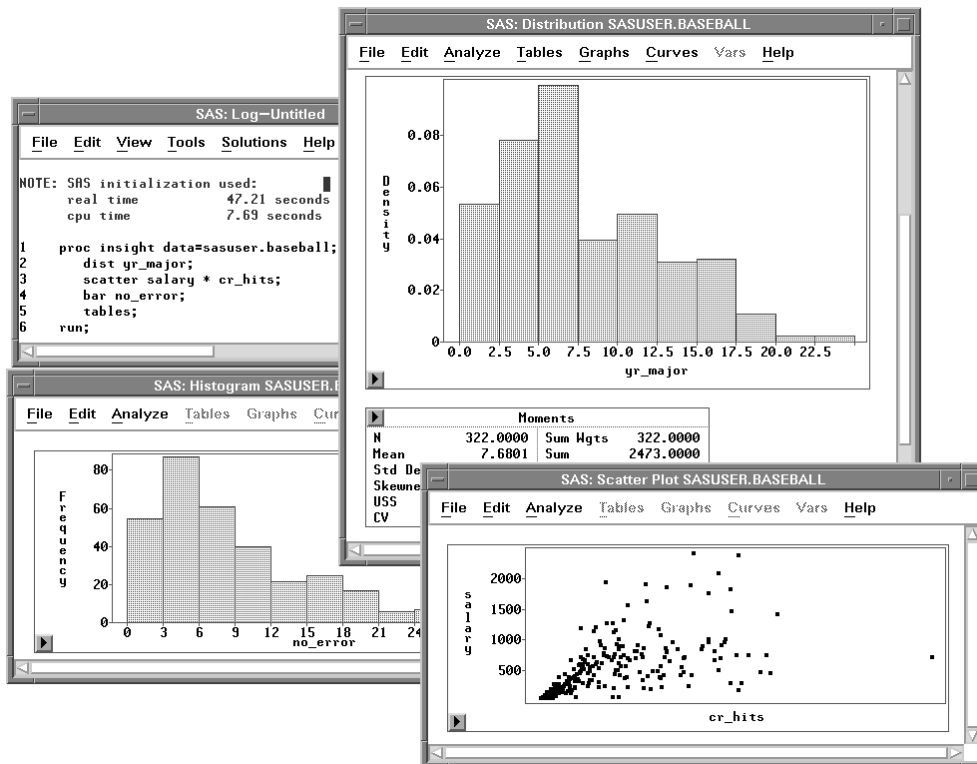
Figure 41.1. SAS/INSIGHT Statements and Output

Details

You can use the following statements when invoking SAS/INSIGHT either as a procedure or as a task. Brackets (<>) denote optional parameters.

PROC INSIGHT *< INFILE=fileref > < FILE<=fileref> >*
      < DATA=SAS-data-set > < TOOLS >
      < NOMENU > < NOBUTTON > < NOCONFIRM >;
WINDOW *< x y width height > < / NOSCROLL >;*
OPEN *SAS-data-set < / NODISPLAY >;*
BY *< variable-list >;*
CLASS *variable-list;*
BAR *variable-list*
      < / < FREQ=variable > < OTHER=value >
      < XAXIS=axis > < YAXIS=axis > >;
BOX *variable-list < * variable-list >*
      < / < FREQ=variable > < LABEL=variable >
      < OTHER=value > < < MARKERSIZE | MS >=value >
      < YAXIS=axis > >;
LINE *variable-list * variable*
      < / < LABEL=variable > < < MARKERSIZE | MS >=value >
      < XAXIS=axis > < YAXIS=axis > >;
SCATTER *variable-list * variable-list*
      < / < LABEL=variable > < < MARKERSIZE | MS >=value >
      < XAXIS=axis > < YAXIS=axis > >;
ROTATE *variable-list * variable-list * variable-list*
      < / < LABEL=variable > < < MARKERSIZE | MS >=value >
      < XAXIS=axis > < YAXIS=axis > < ZAXIS=axis > >;
DIST *variable-list*
      < / < FREQ=variable > < WEIGHT=variable >
      < LABEL=variable > >;
MULT *variable-list*
      < / < FREQ=variable > < WEIGHT=variable >
      < LABEL=variable > >;
FIT *variable-list < = effects-list >*
      < / < FREQ=variable > < WEIGHT=variable >
      < LABEL=variable > < NOINT >
      < RESP=response > < BINOM=variable >
      < OFFSET=variable > < LINK=link >
      < POWER=value > < NOEXACT > < FISHER >
      < QUASI > < SCALE=scale > < CONSTANT=value > >;
TABLES*;*
RUN*;*
QUIT*;*

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Unless you override them with the options listed above, graph and analysis statements use options stored in your SASUSER.PROFILE catalog. For more information on SAS/INSIGHT options, see Chapter 30, "Working with Other SAS Products."

The WINDOW statement and the NODISPLAY, OTHER=, MARKERSIZE=, and axis options can be used as input, but they are not recordable.

PROC INSIGHT Statement

> **PROC INSIGHT** *< INFILE=fileref > < FILE<=fileref > >*
>
> *< DATA=SAS-data-set > < TOOLS >*
>
> *< NOMENU > < NOBUTTON > < NOCONFIRM >***;**

PROC INSIGHT options apply to both the procedure and the task. When invoking SAS/INSIGHT from the command line, you can follow the INSIGHT command with any of the PROC INSIGHT options.

INFILE=*fileref*
> The INFILE= option directs SAS/INSIGHT software to read additional statements from the specified text file. For examples using the INFILE= option, see Chapter 30, "Working with Other SAS Products."

FILE | FILE=*fileref*
> The FILE option directs SAS/INSIGHT software to write statements to the SAS log. FILE=*fileref* directs SAS/INSIGHT software to write statements to the text file *fileref*. For examples using the FILE option, see Chapter 30, "Working with Other SAS Products."

DATA | DATA=*SAS-data-set*
> The DATA option opens a SAS data set and displays it in a window. If DATA is used without =*SAS-data-set*, a new data window is created. You can use either the DATA option or the OPEN statement to specify an initial data set. If you use neither, but simply enter "insight" or "proc insight; run;", a data set dialog prompts you to choose an initial data set.
>
> You can specify data set options in parentheses after the data set name. For example, to see all businesses that had large profits, you might enter

```
insight data=sasuser.business(where=(profits>=2000))
```

> Alternatively, you can enter data set options by pressing the **Options** button in the data set dialog. Data set options are described in *SAS Language Reference: Dictionary*.

TOOLS
> The TOOLS option causes the Tools window to be displayed by default. If you use tools frequently, this option saves the step of choosing **Edit:Windows:Tools**.

NOMENU | NOMEN

> The NOMENU option suppresses the display of menu bars. If your host defines a pop-up key, menu bars are still available when you press the pop-up key in an area containing no graphs or tables.

NOBUTTON | NOBUT

> The NOBUTTON option suppresses the display of pop-up menu buttons. If your host defines a pop-up key, pop-up menus are still available when you press the pop-up key on graphs or tables.

NOCONFIRM | NOCON

> The NOCONFIRM option suppresses the display of confirmation dialogs for potentially harmful user actions. Such actions include deleting variables, closing data windows, and exiting SAS/INSIGHT. By default, confirmation dialogs provide a chance to cancel these actions.

WINDOW Statement

> **WINDOW** *< x y width height > < / NOSCROLL >*;

The WINDOW statement specifies the position of subsequently created windows. Parameters are percentage values between 0 and 100. If parameters are omitted, the next created window uses a default position.

For example, to position a window in the upper left corner, covering one quarter of the display, you might enter

```
window 0 0 50 50;
```

To restore default positioning, use

```
window;
```

You can use the NOSCROLL option to create windows without scroll bars. On most hosts, this option simplifies your display. However, it should be used only when creating single graphs for which scrolling is not needed.

OPEN Statement

> **OPEN** *SAS-data-set < / NODISPLAY >*;

The OPEN statement opens a SAS data set and displays it in a window. An OPEN statement with the NODISPLAY option opens a data set without displaying a window.

You can use the OPEN statement to open multiple data sets at the same time. BY, CLASS, graph, and analysis statements apply only to the most recently opened data set.

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You can specify data set options in parentheses after the data set name. For example, to see all businesses that had large profits, you might enter

```
open sasuser.business(where=(profits>=2000));
```

Data set options are described in *SAS Language Reference: Dictionary*.

BY Statement

BY < *variable-list* >;

The BY statement assigns variables the group role in subsequent graphs and analyses.

To de-assign group roles, use the BY statement without specifying variables.

CLASS Statement

CLASS *variable-list*;

The CLASS statement sets the measurement level of the specified variables to nominal. Use this statement to override the default interval measurement level of numeric variables.

BAR Statement

BAR *variable-list*

< / < FREQ=*variable* > < OTHER=*value* >

< XAXIS=*axis* > < YAXIS=*axis* > >;

The BAR statement creates bar charts or histograms for the specified **Y** variables. You can use the FREQ= option to assign a **Frequency** variable.

Use the OTHER= option to set the "Other" threshold for nominal bar charts. The "Other" threshold is a percentage between 0 and 100.

Use the XAXIS= and YAXIS= options to specify axes for numeric variables with interval measurement level. The *axis* specification is a list of six numeric values: *First Tick*, *Last Tick*, *Tick Increment*, *Number of Minor Ticks*, *Axis Minimum*, and *Axis Maximum*.

For example, to specify tick marks ranging from 2 to 8, with tick increment 2, 1 minor tick, and Y axis ranging from 0 to 10, you could use

```
bar age / yaxis = 2 8 2 1 0 10;
```

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Note that the "X" and "Y" prefixes refer to variable roles, not vertical or horizontal orientation. For the BAR statement, the YAXIS= option specifies the axis of the **Y** variable, and the XAXIS= option specifies the Frequency axis.

BOX Statement

> **BOX** *variable-list* < * *variable-list* >
>
>   < / < FREQ=*variable* > < LABEL=*variable* >
>
>   < OTHER=*value* > < < MARKERSIZE | MS >=*value* >
>
>   < YAXIS=*axis* > >;

The BOX statement creates box or mosaic plots. The BOX statement requires at least one list of **Y** variables, optionally followed by an asterisk (*) and a list of **X** variables. If the **Y** variables have interval measurement level, the BOX statement creates box plots. If the **Y** variables are nominal, the BOX statement creates mosaic plots.

If you use **X** variables, you get one plot for each **Y** variable, and each plot contains one schematic diagram for each combination of **X** values. If you use no **X** variables, you get one plot containing one schematic diagram for each **Y** variable.

You can use the FREQ= and LABEL= options to assign **Frequency** and **Label** variables.

Use the OTHER= option to set the "Other" threshold for mosaic plots. The "Other" threshold is a percentage between 0 and 100.

Use the MARKERSIZE= or MS= option to specify the size of observation markers. Marker size is a number between 1 and 8.

Use the YAXIS= option to specify a numeric axis for the Y variable. The syntax for axis options is described under the BAR statement.

LINE Statement

> **LINE** *variable-list* * *variable*
>
>   < / < LABEL=*variable* > < < MARKERSIZE | MS >=*value* >
>
>   < XAXIS=*axis* > < YAXIS=*axis* > >;

The LINE statement creates overlaid line plots, with one line for each **Y** variable.

Use at least one **Y** variable, followed by an asterisk, followed by a single **X** variable. You can use the LABEL= option to assign a **Label** variable.

Use the MARKERSIZE= or MS= option to specify the size of observation markers. Marker size is a number between 1 and 8.

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Use the XAXIS= and YAXIS= options to specify numeric axes. The syntax for axis options is described under the BAR statement.

SCATTER Statement

> **SCATTER** *variable-list* ***** *variable-list*
>
> *< / < LABEL=variable > < < MARKERSIZE | MS >=value >*
>
> *< XAXIS=axis > < YAXIS=axis > >***;**

The SCATTER statement creates two-dimensional scatter plots.

Use at least one **Y** variable, followed by an asterisk, followed by at least one **X** variable. Use multiple **Y** and **X** variables to create a scatter plot matrix. For example, you might use

```
scatter a b c * a b c;
```

to create a 3×3 scatter plot matrix for the variables **a**, **b**, and **c**.

You can use the LABEL= option to assign a **Label** variable.

Use the MARKERSIZE= or MS= option to specify the size of observation markers. Marker size is a number between 1 and 8.

Use the XAXIS= and YAXIS= options to specify numeric axes. The syntax for axis options is described under the BAR statement.

CONTOUR Statement

> **CONTOUR** *variable-list* ***** *variable-list* ******variable-list*
>
> *< / < LABEL=variable > < < MARKERSIZE | MS >=value >*
>
> *< XAXIS=axis > < YAXIS=axis > < ZAXIS=axis > >***;**

The CONTOUR statement creates level curves of a surface that fits the data, assuming that the **Z** variable is a function of the **X** and **Y** variables.

Use at least one **Z** variable, followed by an asterisk, followed by at least one **Y** variable, followed by an asterisk, followed by at least one **X** variable. Use multiple **Z**, **Y**, and **X** variables to create a matrix of contour plots.

You can use the LABEL= option to assign a **Label** variable.

Use the MARKERSIZE= or MS= option to specify the size of observation markers. Marker size is a number between 1 and 8.

Use the XAXIS=, YAXIS=, and ZAXIS= options to specify numeric axes. The syntax for axis options is described under the BAR statement.

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ROTATE Statement

> **ROTATE** *variable-list* * *variable-list* * *variable-list*
>
> *< / < LABEL=variable > < < MARKERSIZE | MS >=value >*
>
> *< XAXIS=axis > < YAXIS=axis > < ZAXIS=axis > >*;

The ROTATE statement creates three-dimensional rotating plots.

Use at least one **Z** variable, followed by an asterisk, followed by at least one **Y** variable, followed by an asterisk, followed by at least one **X** variable. Use multiple **Z**, **Y**, and **X** variables to create a rotating plot matrix. For example, you might use

```
rotate a b c d * a b c d * a b c d;
```

to create a matrix displaying all possible three-dimensional plots for the variables **a**, **b**, **c**, and **d**.

You can use the LABEL= option to assign a **Label** variable.

Use the MARKERSIZE= or MS= option to specify the size of observation markers. Marker size is a number between 1 and 8.

Use the XAXIS=, YAXIS=, and ZAXIS= options to specify numeric axes. Syntax of axis options is described under the BAR statement.

DIST Statement

> **DIST** *variable-list*
>
> *< / < FREQ=variable > < WEIGHT=variable >*
>
> *< LABEL=variable > >*;

The DIST statement creates a distribution analysis of the specified **Y** variables. You can use the FREQ=, WEIGHT=, and LABEL= options to assign **Freq**, **Weight**, and **Label** variables.

MULT Statement

> **MULT** *variable-list*
>
> *< / < FREQ=variable > < WEIGHT=variable >*
>
> *< LABEL=variable > >*;

The MULT statement creates a multivariate analysis of the specified **Y** variables. You can use the FREQ=, WEIGHT=, and LABEL= options to assign **Freq**, **Weight**, and **Label** variables.

FIT Statement

> **FIT** *variable-list* < = *effects-list* >
>
> < / < FREQ=*variable* > < WEIGHT=*variable* >
>
> < LABEL=*variable* > < NOINT >
>
> < RESP=*response* > < BINOM=*variable* >
>
> < OFFSET=*variable* > < LINK=*link* >
>
> < POWER=*value* > < NOEXACT > < FISHER >
>
> < QUASI > < SCALE=*scale* > < CONSTANT=*value* > >**;**

The FIT statement creates a fit analysis.

You must specify at least one **Y** variable. You can follow the **Y** variables with an equal sign (=) and a list of model effects, including simple, crossed, and nested effects:

```
Y = X
Y = X1 * X2
Y = X( A B )
```

If you do not specify an effects list, a model with only an intercept term (mean) is fit.

You can use the FREQ=, WEIGHT=, and LABEL= options to assign **Freq**, **Weight**, and **Label** variables.

FIT statement options default to fit classical linear models, but you can set them to fit the generalized linear model.

NOINT
Use the NOINT option to fit a model without an intercept term.

RESP=*response*
For response distribution, choose NORMAL, INVGAUSS, GAMMA, POISSON, or BINOMIAL. By default, RESP= is NORMAL.

BINOM=*variable*
Use the BINOM= option to specify a **Binomial** variable when RESP=Binomial. When RESP is not Binomial, the BINOM= option is not used.

OFFSET=*variable*
Use the OFFSET= option to specify an **Offset** variable.

LINK=*link*
For link function, choose CANONICAL, IDENTITY, LOG, LOGIT, PROBIT, CLOGCLOG, or POWER. By default, LINK= is CANONICAL.

POWER=*value*
Use the POWER= option to set a value for the POWER link function. If LINK= is not set to POWER, the POWER= option is not used.

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NOEXACT

Use the NOEXACT option to fit a linear model without using exact distributions for the test statistics.

FISHER

Use the FISHER option to use Fisher's scoring method in the maximum-likelihood estimation for the regression parameters.

QUASI

If overdispersion is present in the model, you can use the QUASI option to fit the generalized linear model using the quasi-likelihood functions. To use the QUASI option, you must also set the SCALE= option to a scale other than M **SCALE=***scale*

For scale, choose MLE, DEVIANCE, PEARSON, or CONSTANT. By default, SCALE= is MLE (maximum-likelihood estimate).

CONSTANT=*value*

Use the CONSTANT= option to set a constant value when SCALE=CONSTANT. If SCALE= is not set to CONSTANT, the CONSTANT= option is not used.

TABLES statement

> **TABLES;**

The TABLES statement saves and prints all tables in the most recent analysis, using the Output Delivery System.

You can redirect output to a text file by using the PRINTTO procedure.

For more information on PROC PRINTTO, refer to the *SAS Procedures Guide*.

RUN statement

> **RUN;**

The RUN statement invokes SAS/INSIGHT software and executes all preceding SAS/INSIGHT statements.

Use the RUN statement if you want SAS/INSIGHT to remain available after executing your statements. You must terminate the list of statements with either a RUN or a QUIT statement.

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QUIT statement

QUIT;

The QUIT statement invokes SAS/INSIGHT software, executes all preceding statements, and exits SAS/INSIGHT software.

Use the QUIT statement if you do not want SAS/INSIGHT to remain available after executing your statements. You must terminate the list of statements with either a QUIT or a RUN statement.