SAS/ETS® 14.2 User's Guide
Window Reference

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SAS/ETS® 14.2 User's Guide

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Chapter 62
Window Reference

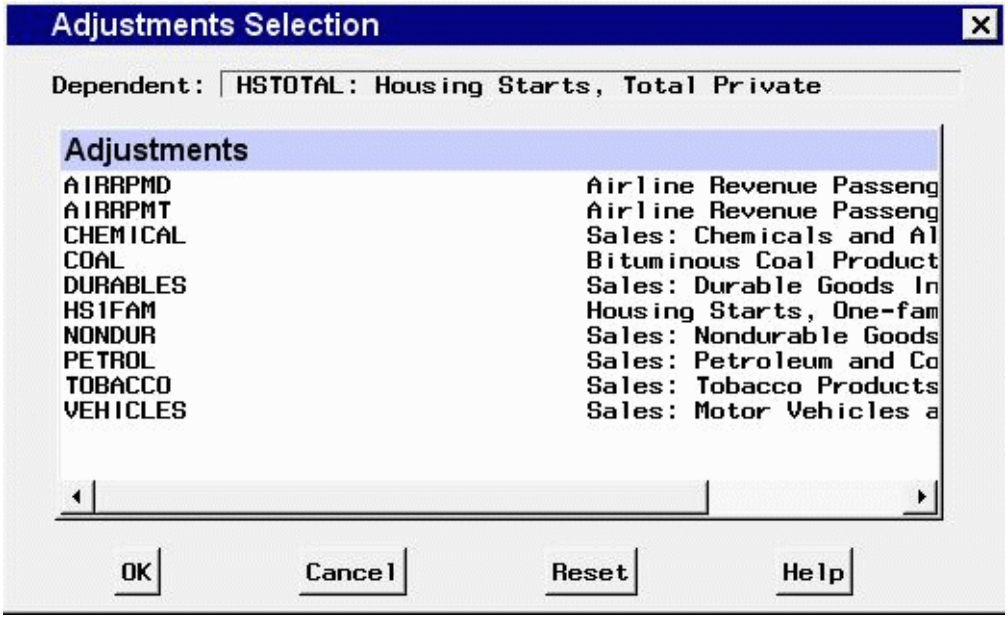
Contents

Overview

This chapter provides a reference to the various windows of the Time Series Forecasting System. The windows are presented in alphabetical order by name. Each section describes the purpose of the window, how to open it, its controls, fields, and menus. For windows that have their own menus, there is a description of each menu item under the heading "Menu Bar." These windows also have a toolbar with icons that duplicate the more commonly used menu items. Each icon has a *screen tip*: a brief description that appears when you hover the mouse pointer over the icon. If you don't see the screen tips, open the SAS Preferences window, under the Options submenu of the Tools menu. Select the View tab and make sure the "Screen tips" check box is checked.

Adjustments Selection Window

Use the Adjustments Selection window to select input variables for use as adjustments to the forecasts and add them to the Predictors list. Invoke this window from the pop-up menu that appears when you click the Add button in the ARIMA Model Specification window or Custom Model Specification window. For more information, see the "Adjustments" section in Chapter 60, "Using Predictor Variables."



Controls and Fields

`Dependent`
: is the name and variable label of the current series.

`Adjustments`
: is a table that lists the names and labels in the input data set available for selection as adjustments. The variables you select are highlighted. Selecting a highlighted row again deselects that variable.

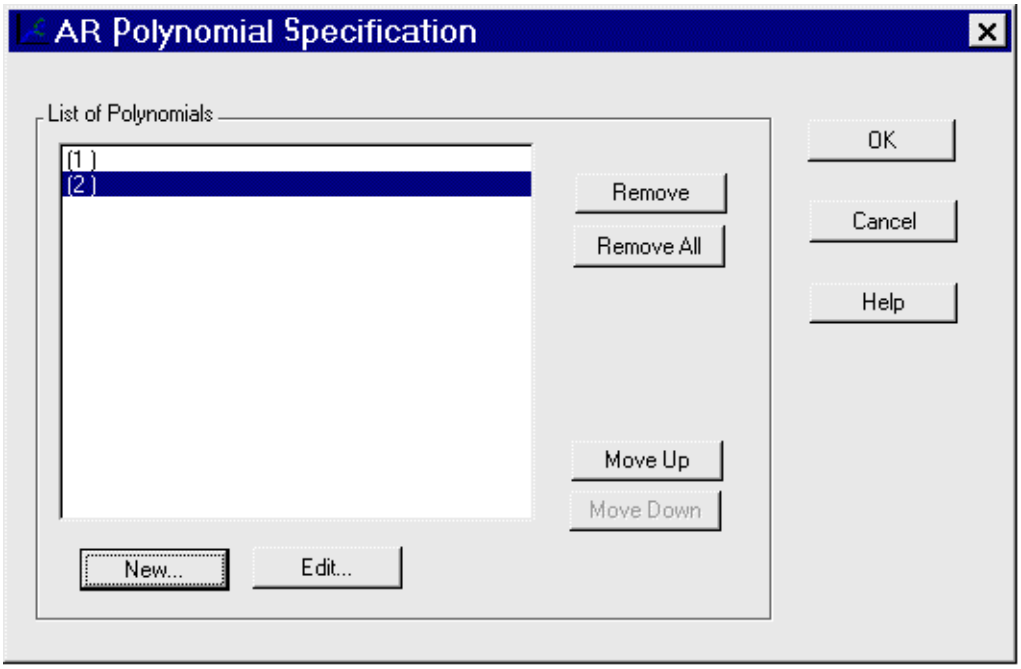
`OK`
: closes the Adjustments Selection window and adds the selected variables as adjustments in the model.

`Cancel`
: closes the window without adding any adjustments.

`Reset`
: resets all selections to their initial values upon entry to the window.

AR/MA Polynomial Specification Window

Use these windows to specify the autoregressive and moving-average terms in a factored ARIMA model. Access the AR Polynomial Specification window from the Set button next to the Autoregressive term in the Factored ARIMA Model Specification window. Access the MA Polynomial Specification window from the Set button next to the Moving Average term.



Controls and Fields

`List of Polynomials`

lists the polynomials that have been specified. Each polynomial is represented by a comma-delimited list of lag values enclosed in parentheses.

`New`
opens the Polynomial Specification window to add a new polynomial to the model.

`Edit`
opens the Polynomial Specification window to edit a polynomial that has been selected. If no polynomial is selected, this button is unavailable.

`Remove`
removes a selected polynomial from the list. If none are selected, this button is unavailable.

`Remove All`
clears the list of polynomials.

`Move Up`
moves a selected polynomial up one position in the list. If no polynomial is selected, or the first one is selected, this button is unavailable.

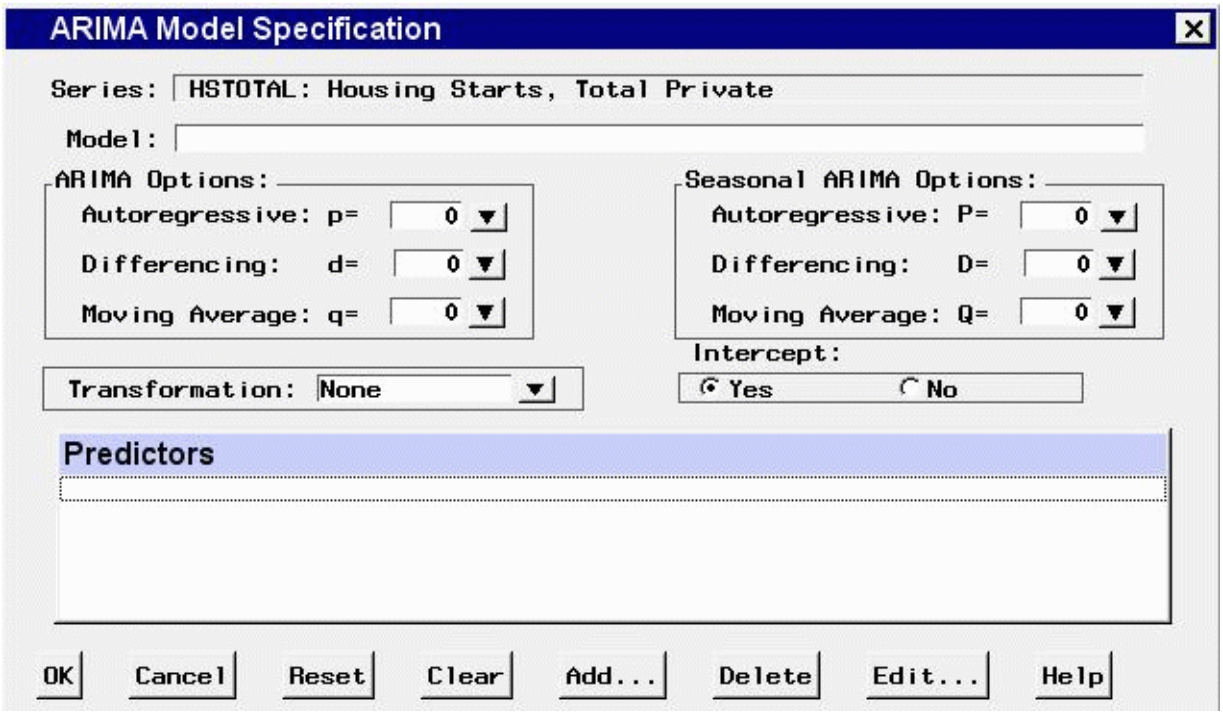
`Move Down`
moves a selected polynomial down one position in the list. If no polynomial is selected, or the last one is selected, this button is unavailable.

`OK`
closes the window and returns the specified list of polynomials to the Factored ARIMA Model Specification window.

`Cancel`
closes the window and discards any changes made to the list of polynomials.

ARIMA Model Specification Window

Use the ARIMA Model Specification window to specify and fit an ARIMA model with or without predictor effects as inputs. Access it from the Develop Models menu, where it is invoked from the Fit Model item under Edit on the menu bar, or from the pop-up menu when you click an empty area of the model table.



Controls and Fields

`Series`
is the name and variable label of the current series.

`Model`
is a descriptive label for the model that you specify. You can type a label in this field or allow the system to provide a label. If you leave the label blank, a label is generated automatically based on the options you specify.

`ARIMA Options`
specify the orders of the ARIMA model. You can either type in a value or click the arrow to select from a list.

`Autoregressive`
defines the order of the autoregressive part of the model.

Differencing
: defines the order of simple differencing—for example, first difference or second difference.

Moving Average
: defines the order of the moving-average part of the model.

Seasonal ARIMA Options
: specifies the orders of the seasonal part of the ARIMA model. You can either type in a value or click the arrow to select from a list.

  Autoregressive
  : defines the order of the seasonal autoregressive part of the model.

  Differencing
  : defines the order of seasonal differencing—for example, first difference or second difference at the seasonal lags.

  Moving Average
  : defines the order of the seasonal moving-average part of the model.

Transformation
: defines the series transformation for the model. When a transformation is specified, the ARIMA model is fit to the transformed series, and forecasts are produced by applying the inverse transformation to the ARIMA model predictions. The available transformations are Log, Logistic, Square Root, Box-Cox, and None.

Intercept
: specifies whether a mean or intercept parameter is included in the ARIMA model. By default, the Intercept option is set to No when the model includes differencing and Yes when there is no differencing.

Predictors
: lists the predictor effects included as inputs in the model.

OK
: closes the ARIMA Model Specification window and fits the model.

Cancel
: closes the ARIMA Model Specification window without fitting the model. Any options you specified are lost.

Reset
: resets all options to their initial values upon entry to the ARIMA Model Specification window. This might be useful when editing an existing model specification; otherwise, Reset has the same function as Clear.

Clear
: resets all options to their default values.

Add
: opens a menu of types of predictors to add to the Predictors list.

Delete
: deletes the selected (highlighted) entry from the Predictors list.

Edit
: edits the selected (highlighted) entry in the Predictors list.

Mouse Button Actions

You can select or deselect entries in the Predictors list by clicking them. The selected (highlighted) predictor effect is acted on by the Delete and Edit buttons. Double-clicking on a predictor in the list invokes an appropriate edit action for that predictor.

If you right-click an entry in the Predictors list, the system displays the following menu of actions that encompass the features of the Add, Delete, and Edit buttons.

`Add Linear Trend`
: adds a Linear Trend item to the Predictors list.

`Add Trend Curve`
: opens a menu of different time trend curves and adds the curve you select to the Predictors list. Certain trend curve specifications also set the Transformation field.

`Add Regressors`
: opens the Regressors Selection window to enable you to select other series in the input data set as regressors to predict the dependent series and add them to the Predictors list.

`Add Adjustments`
: opens the Adjustments Selection window to enable you to select other series in the input data set for use as adjustments to the forecasts and add them to the Predictors list.

`Add Dynamic Regressor`
: opens the Dynamic Regressor Selection window to enable you to select a series in the input data set as a predictor of the dependent series and also specify a transfer function model for the effect of the predictor series.

`Add Interventions`
: opens the Interventions for Series window to enable you to define and select intervention effects and add them to the Predictors list.

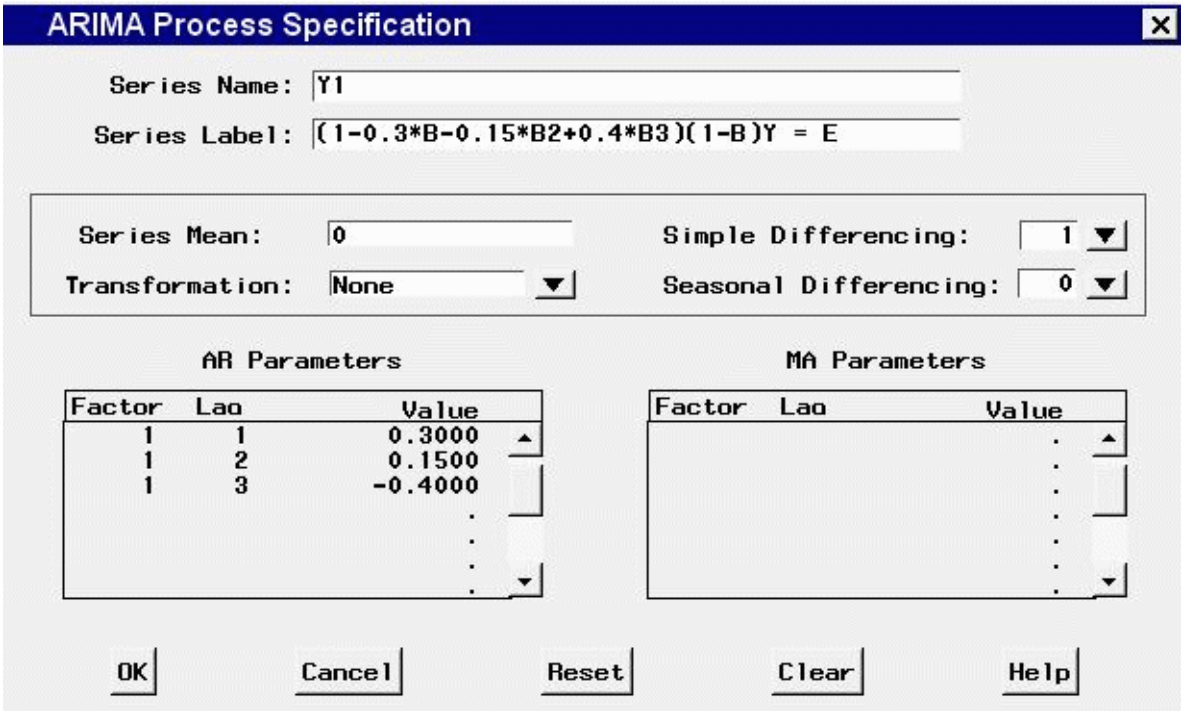
`Add Seasonal Dummies`
: adds a Seasonal Dummies predictor item to the Predictors list.

`Edit Predictor`
: edits the selected (highlighted) entry in the Predictors list.

`Delete Predictors`
: deletes the selected (highlighted) entry from the Predictors list.

ARIMA Process Specification Window

Use the ARIMA Process Specification window to define ARIMA processes for simulation. Invoke this window from the Add Series button in the Time Series Simulation window.



Controls and Fields

`Series Name`
: is the variable name for the series to be simulated.

`Series Label`
: is the variable label for the series to be simulated.

`Series Mean`
: is the mean of the simulated series.

`Transformation`
: defines the series transformation.

`Simple Differencing`
: is the order of simple differencing for the series.

`Seasonal Differencing`
: is the order of seasonal differencing for the series.

`AR Parameters`
: is a table of autoregressive terms for the simulated ARIMA process. Enter a value for Factor, Lag, and Value for each term of the AR part of the process you want to simulate. For a non-factored AR model, make the Factor values the same for all terms. For a factored AR model, use different Factor values to group the terms into the factors.

`MA Parameters`
: is a table of moving-average terms for the simulated ARIMA process. Enter a value for Factor, Lag, and Value for each term of the MA part of the process you want to simulate. For a non-factored MA model, make the Factor values the same for all terms. For a factored MA model, use different Factor values to group the terms into the factors.

`OK`
closes the ARIMA Process Specification window and adds the specified process to the Series to Generate list in the Time Series Simulation window.

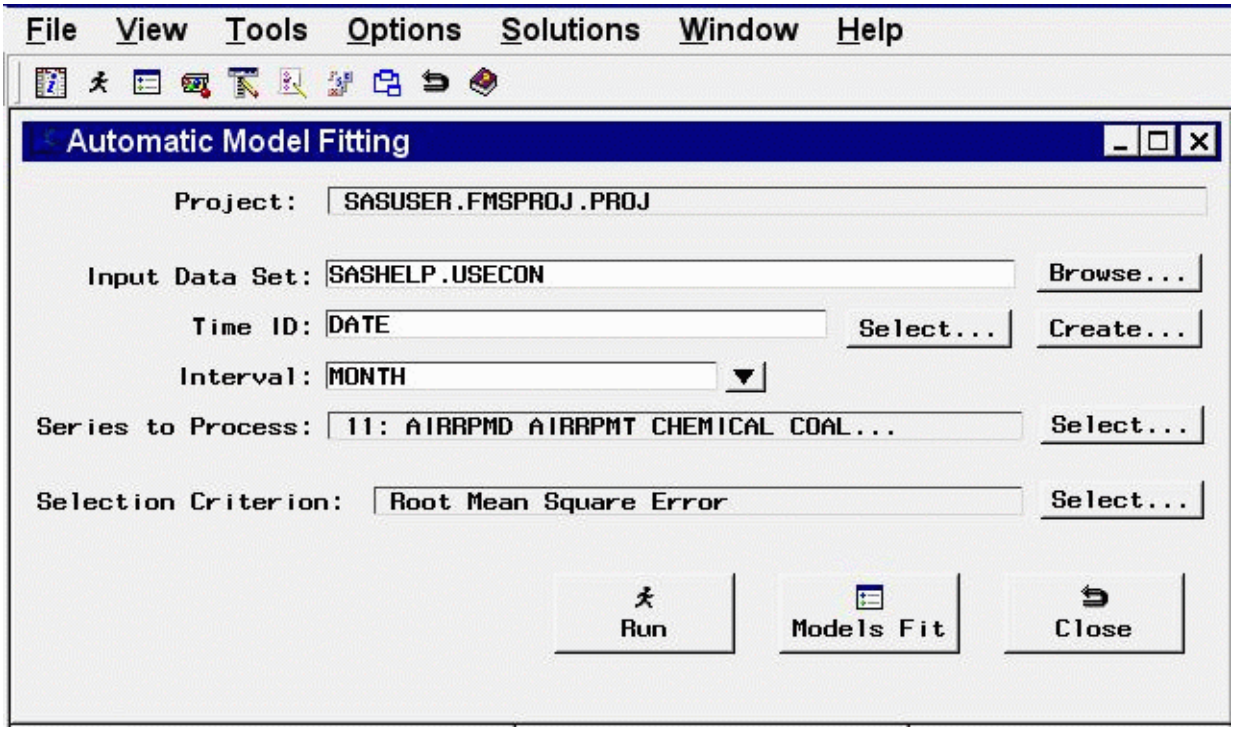
`Cancel`
closes the window without adding to the Series to Generate list. Any options you specified are lost.

`Reset`
resets all the fields to their initial values upon entry to the window.

`Clear`
resets all the fields to their default values.

Automatic Model Fitting Window

Use the Automatic Model Fitting window to perform automatic model selection on all series or selected series in an input data set. Invoke this window by using the Fit Models Automatically button in the Time Series Forecasting window. Note that you can also perform automatic model fitting, one series at a time, from the Develop Models window.



Controls and Fields

`Project`
is the name of the SAS catalog entry in which the results of the model search process are stored.

`Input Data Set`
is the name of the current input data set. You can type in a one-level or two-level data set name here.

`Browse` button
opens the Data Set Selection window for selecting an input data set.

`Time ID`
is the name of the ID variable for the input data set. You can type in the variable name here or use the Select or Create button.

time ID `Select` button
opens the Time ID Variable Specification window.

time ID `Create` button
opens a menu of choices of methods for creating a time ID variable for the input data set. Use this feature if the input data set does not already contain a valid time ID variable.

`Interval`
is the time interval between observations (data frequency) in the current input data set. You can type in an interval name or select one by using the combo box pop-up menu.

`Series to Process`
indicates the number and names of time series variables for which forecasting model selection will be applied.

Series to Process `Select` button
opens the Series to Process window to let you select the series for which you want to fit models.

`Selection Criterion`
shows the goodness-of-fit statistic that will be used to determine the best fitting model for each series.

Selection Criterion `Select` button
opens the Model Selection Criterion window to enable you to select the goodness-of-fit statistic that will be used to determine the best fitting model for each series.

`Run` button
begins the automatic model fitting process.

`Models Fit` button
opens the Automatic Model Fitting Results window to display the models fit during the current invocation of the Automatic Model Fitting window. The results appear automatically when model fitting is complete, but this button enables you to redisplay the results window.

`Close` button
closes the Automatic Model Fitting window.

Menu Bar

`File`

`Import Data`
is available if you license SAS/ACCESS software. It opens an Import Wizard, which you can use to import your data from an external spreadsheet or database to a SAS data set for use in the Time Series Forecasting System.

`Export Data`
: is available if you license SAS/ACCESS software. It opens an Export Wizard, which you can use to export a SAS data set, such as a forecast data set created with the Time Series Forecasting System, to an external spreadsheet or database.

`Print Setup`
: opens the Print Setup window, which allows you to access your operating system print setup.

`Close`
: closes the Automatic Model Fitting window.

`View`

`Input Data Set`
: opens a Viewtable window to browse the current input data set.

`Models Fit`
: opens Automatic Model Fitting Results window to show the forecasting models fit during the current invocation of the Automatic Model Fitting window. This has the same function as the Models Fit button.

`Tools`

`Fit Models`
: performs the automatic model selection process for the selected series. This has the same function as the Run button.

`Options`

`Default Time Ranges`
: opens the Default Time Ranges window to enable you to control how the system sets the time ranges for series.

`Model Selection List`
: opens the Model Selection List editor window. Use this action to control the forecasting models considered by the automatic model selection process and displayed in the Models to Fit window.

`Model Selection Criterion`
: opens the Model Selection Criterion window, which presents a list of goodness-of-fit statistics and enables you to select the fit statistic that is displayed in the table and used by the automatic model selection process to determine the best fitting model. This has the same function as the Selection Criterion Select button.

`Statistics of Fit`
: opens the Statistics of Fit Selection window, which presents a list of statistics that the system can display. Use this action to customize the list of statistics shown in the Statistics of Fit table and available for selection from the Model Selection Criterion menu.

`Forecast Options`
: opens the Forecast Options window, which enables you to control the widths of forecast confidence limits and control the kind of predicted values computed for models that include series transformations.

`Forecast Data Set`
See the section "Produce Forecasts Window" on page 3997.

`Alignment of Dates`

`Beginning`
aligns dates that the system generates to identify forecast observations in output data sets to the beginning of the time intervals.

`Middle`
aligns dates that the system generates to identify forecast observations in output data sets to the midpoints of the time intervals.

`End`
aligns dates that the system generates to identify forecast observations in output data sets to the end of the time intervals.

`Automatic Fit`
opens the Automatic Model Selection Options window, which enables you to control the number of models retained by the automatic model selection process and whether the models considered for automatic selection are subset according to the series diagnostics.

`Tool Bar Type`

`Image Only`
displays the toolbar items as icons without text.

`Label Only`
displays the toolbar items as text without icon images.

`Both`
displays the toolbar items with both text and icon images.

`Include Interventions`
controls whether intervention effects defined for the current series are automatically added as predictors to the models considered by the automatic selection process. A check mark or filled check box next to this item indicates that the option is turned on.

`Print Audit Trail`
prints to the SAS log information about the models fit by the system. A check mark or filled check box next to this item indicates that the audit option is turned on.

`Show Source Statements`
controls whether SAS statements submitted by the forecasting system are printed in the SAS log. When the Show Source Statements option is selected, the system sets the SAS system option SOURCE before submitting SAS statements; otherwise, the system uses the NOSOURCE option. Note that only some of the functions performed by the forecasting system are accomplished by submitting SAS statements. A check mark or filled check box next to this item indicates that the option is turned on.

Automatic Model Fitting Results Window

This resizable window displays the models fit by the most recent invocation of the Automatic Model Fitting window. It appears automatically after Automatic Model Fitting runs, and can be opened repeatedly from that window by using the Models Fit button or by selecting Models Fit from the View menu. Once you exit the Automatic Model Fitting window, the Automatic Model Fitting Results window cannot be opened again until you fit additional models by using Automatic Model Fitting.

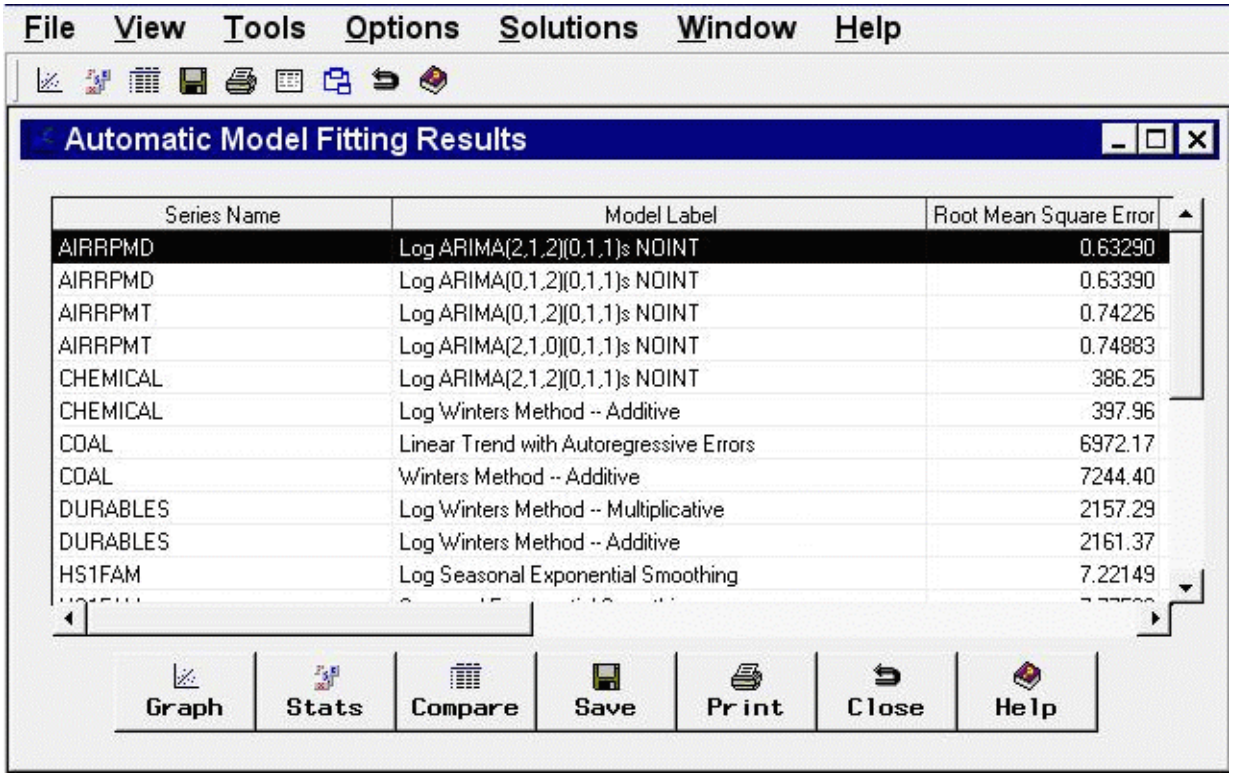


Table Contents

The results table displays the series name in the first column and the model label in the second column. If you have chosen to retain more than one model by using the Automatic Model Selection Options window, more than one row appears in the table for each series; that is, there is a row for each model fit. If you have already fit models to the same series before invoking the Automatic Model Fitting window, those models do not appear here, since the Automatic Model Fitting Results window is intended to show the results of the current operation of Automatic Model Fitting. To see all models that have been fit, use the Manage Projects window.

The third column of the table shows the values of the current model selection criterion statistic. Additional columns show the values of other fit statistics. The set of statistics shown are selectable by using the Statistics of Fit Selection window.

The table can be sorted by any column other than Series Name by clicking on the column heading.

Controls and Fields

`Graph`
opens the Model Viewer window on the model currently selected in the table.

`Stats`
opens the Statistics of Fit Selection window. This controls the set of goodness-of-fit statistics displayed in the table and in other parts of the Time Series Forecasting System.

`Compare`
opens the Model Fit Comparison window for the series currently selected in the table. This button is unavailable if the currently selected row in the table represents a series for which fewer than two models have been fit.

`Save`
opens an output data set dialog box, enabling you to specify a SAS data set to which the contents of the table are saved. Note that this operation saves what you see in the table. If you want to save the models themselves for use in a future session, use the Manage Projects window.

`Print`
prints the contents of the table.

`Close`
closes the window and returns to the Automatic Model Fitting window.

Menu Bar

`File`

`Save`
opens an output data set dialog box, enabling you to specify a SAS data set to which the contents of the table are saved. This has the same function as the Save button.

`Print`
prints the contents of the table. This has the same function as the Print button.

`Import Data`
is available if you license SAS/ACCESS software. It opens an Import Wizard, which you can use to import your data from an external spreadsheet or data base to a SAS data set for use in the Time Series Forecasting System.

`Export Data`
is available if you license SAS/ACCESS software. It opens an Export Wizard, which you can use to export a SAS data set, such as a forecast data set created with the Time Series Forecasting System, to an external spreadsheet or database.

`Print Setup`
opens the Print Setup window, which allows you to access your operating system print setup.

`Close`
closes the window and returns to the Automatic Model Fitting window.

`View`

`Model Predictions`
opens the Model Viewer to display a predicted and actual plot for the currently highlighted model.

`Prediction Errors`
opens the Model Viewer to display the prediction errors for the currently highlighted model.

`Prediction Error Autocorrelations`
opens the Model Viewer to display the prediction error autocorrelations, partial autocorrelations, and inverse autocorrelations for the currently highlighted model.

`Prediction Error Tests`
opens the Model Viewer to display graphs of white noise and stationarity tests on the prediction errors of the currently highlighted model.

`Parameter Estimates`
opens the Model Viewer to display the parameter estimates table for the currently highlighted model.

`Statistics of Fit`
opens the Model Viewer window to display goodness-of-fit statistics for the currently highlighted model.

`Forecast Graph`
opens the Model Viewer to graph the forecasts for the currently highlighted model.

`Forecast Table`
opens the Model Viewer to display forecasts for the currently highlighted model in a table.

`Tools`

`Compare Models`
opens the Model Fit Comparison window to display fit statistics for selected pairs of forecasting models. This item is unavailable until you select a series in the table for which the automatic model fitting run selected two or more models.

`Options`

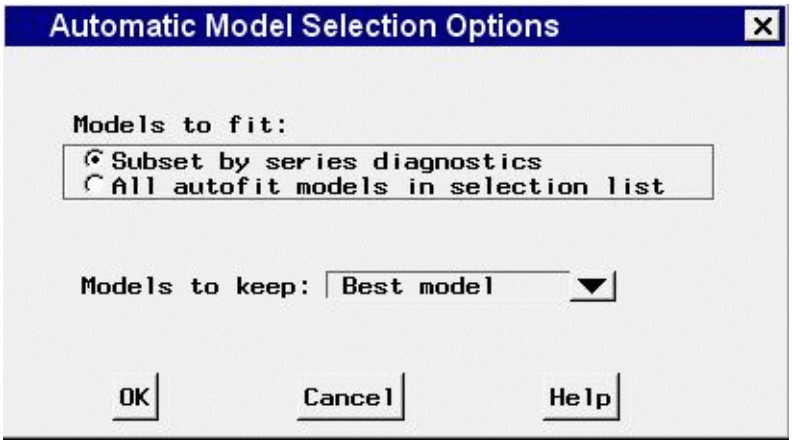
`Statistics of Fit`
opens the Statistics of Fit Selection window. This is the same as the Stats button.

`Column Labels`
selects long or short column labels for the table. Long column labels are used by default.

`ID Columns`
freezes or unfreezes the series and model columns. By default they are frozen so that they remain visible when you scroll the table horizontally to view other columns.

Automatic Model Selection Options Window

Use the Automatic Model Selection Options window to control the automatic selection process. This window is available from the Automatic Fit item of the Options menu in the Develop Models window, Automatic Model Fitting window, and Produce Forecasts window.



Controls and Fields

`Models to fit`

`Subset by series diagnostics`
when selected, causes the automatic model selection process to search only over those models consistent with the series diagnostics.

`All autofit models in selection list`
when selected, causes the automatic model selection process to search over all models in the search list, without regard for the series diagnostics.

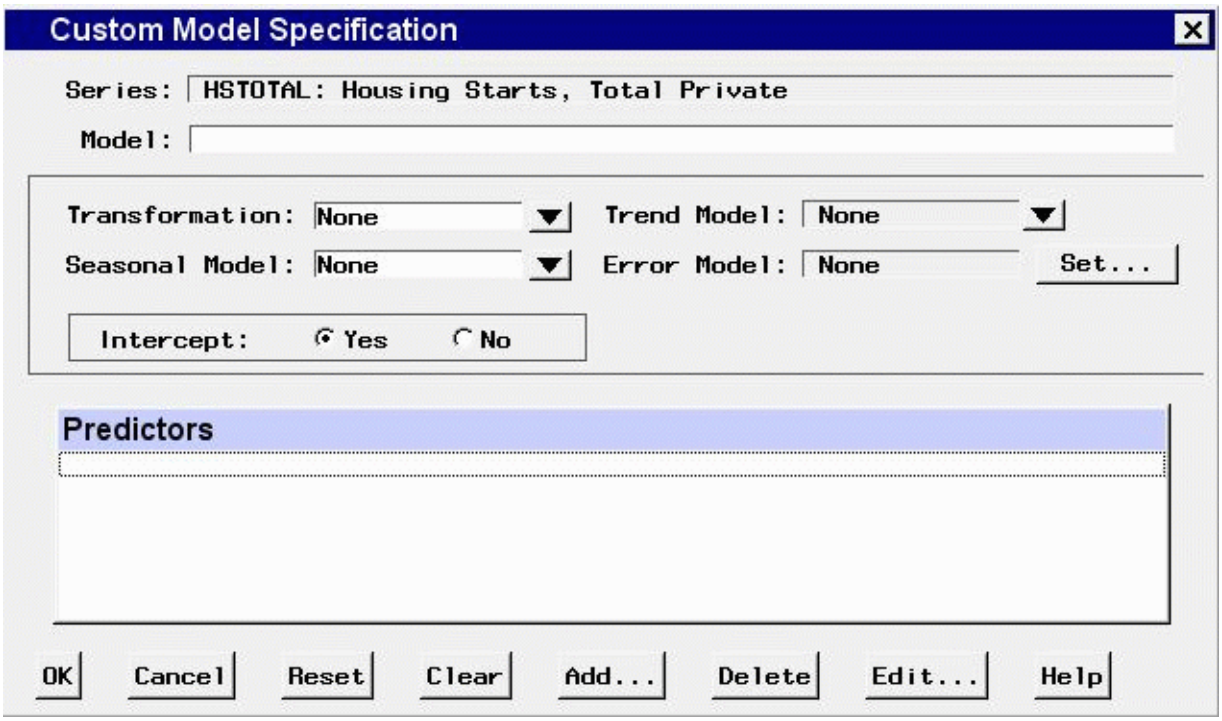
`Models to keep`
specifies how many of the models tried by the automatic model selection process are retained and added to the model list for the series. You can specify the best fitting model only, the best *n* models, where *n* can be 1 through 9, or all models tried.

`OK`
closes the window and saves the automatic model selection options you specified.

`Cancel`
closes the window without changing the automatic model selection options.

Custom Model Specification Window

Use the Custom Model Specification window to specify and fit an ARIMA model with or without predictor effects as inputs. Access it from the Develop Models window, where it is invoked from the Fit Model item under the Edit menu, or from the pop-up menu when you click an empty area of the model table.



Controls and Fields

`Series`
: is the name and variable label of the current series.

`Model`
: is a descriptive label for the model that you specify. You can type a label in this field or allow the system to provide a label. If you leave the label blank, a label is generated automatically based on the options you specify.

`Transformation`
: defines the series transformation for the model. When a transformation is specified, the model is fit to the transformed series, and forecasts are produced by applying the inverse transformation to the resulting forecasts. The following transformations are available:

  `Log`
  : specifies a logarithmic transformation.

  `Logistic`
  : specifies a logistic transformation.

`Square Root`
specifies a square root transformation.

`Box-Cox`
specifies a Box-Cox transform and opens a window to specify the Box-Cox λ parameter.

`None`
specifies no series transformation.

`Trend Model`
controls the model options to model and forecast the series trend. Select from the following:

`Linear Trend`
adds a Linear Trend item to the Predictors list.

`Trend Curve`
brings of a menu of different time trend curves and adds the curve you select to the Predictors list.

`First Difference`
specifies differencing the series.

`Second Difference`
specifies second-order differencing of the series.

`None`
specifies no model for the series trend.

`Seasonal Model`
controls the model options to model and forecast the series seasonality. Select from the following:

`Seasonal ARIMA`
opens the Seasonal ARIMA Model Options window to enable you to specify an ARIMA model for the seasonal pattern in the series.

`Seasonal Difference`
specifies differencing the series at the seasonal lag.

`Seasonal Dummy Regressors`
adds a Seasonal Dummies predictor item to the Predictors list.

`None`
specifies no seasonal model.

`Error Model`
displays the current settings of the autoregressive and moving-average terms, if any, for modeling the prediction error autocorrelation pattern in the series.

`Set` button
opens the Error Model Options window to enable you to set the autoregressive and moving-average terms for modeling the prediction error autocorrelation pattern in the series.

`Intercept`
specifies whether a mean or intercept parameter is included in the model. By default, the Intercept option is set to No when the model includes differencing and set to Yes when there is no differencing.

`Predictors`
is a list of the predictor effects included as inputs in the model.

`OK`
: closes the Custom Model Specification window and fits the model.

`Cancel`
: closes the Custom Model Specification window without fitting the model. Any options you specified are lost.

`Reset`
: resets all options to their initial values upon entry to the Custom Model Specification window. This might be useful when editing an existing model specification; otherwise, Reset has the same function as Clear.

`Clear`
: resets all options to their default values.

`Add`
: opens a menu of types of predictors to add to the Predictors list. Select from the following:

  `Linear Trend`
  : adds a Linear Trend item to the Predictors list.

  `Trend Curve`
  : opens a menu of different time trend curves and adds the curve you select to the Predictors list.

  `Regressors`
  : opens the Regressors Selection window to enable you to select other series in the input data set as regressors to predict the dependent series and add them to the Predictors list.

  `Adjustments`
  : opens the Adjustments Selection window to enable you to select other series in the input data set for use as adjustments to the forecasts and add them to the Predictors list.

  `Dynamic Regressor`
  : opens the Dynamic Regressor Selection window to enable you to select a series in the input data set as a predictor of the dependent series and also specify a transfer function model for the effect of the predictor series.

  `Interventions`
  : opens the Interventions for Series window to enable you to define and select intervention effects and add them to the Predictors list.

  `Seasonal Dummies`
  : adds a Seasonal Dummies predictor item to the Predictors list. This is unavailable if the series interval is not one which has a seasonal cycle.

`Delete`
: deletes the selected (highlighted) entry from the Predictors list.

`Edit`
: edits the selected (highlighted) entry in the Predictors list.

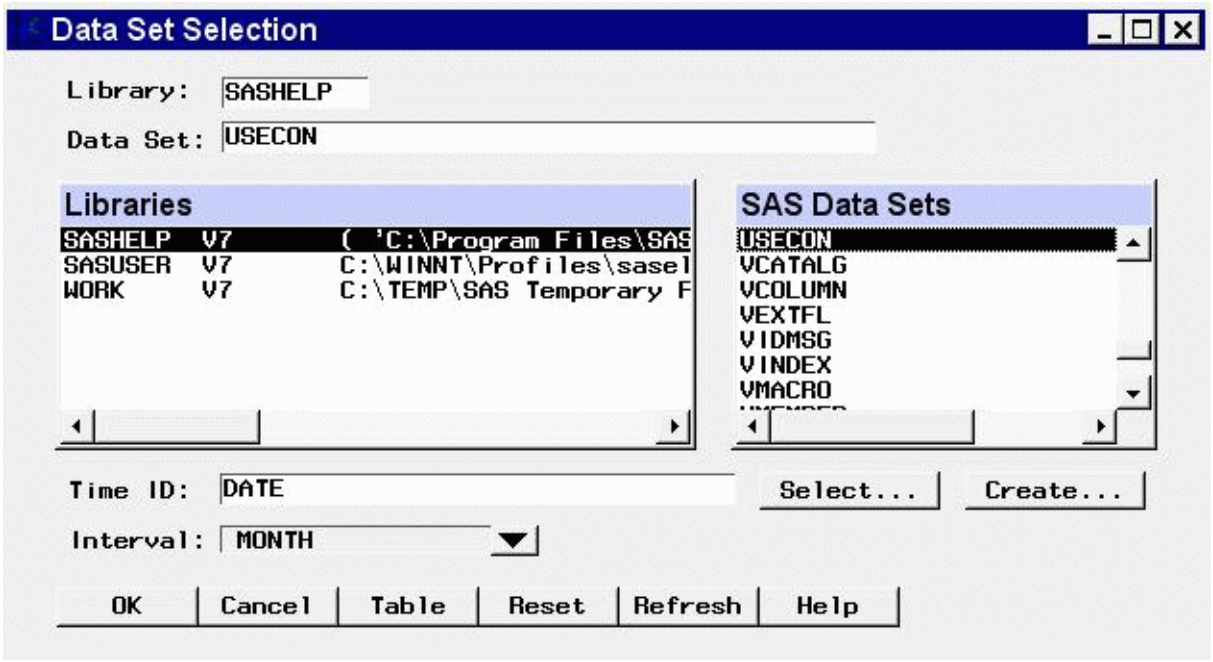
Mouse Button Actions

You can select or deselect entries in the Predictors list by clicking them. The selected (highlighted) predictor effect is acted on by the Delete and Edit buttons. Double-clicking on a predictor in the list invokes an appropriate edit action for that predictor.

If you right-click an entry in the Predictors list and press the right mouse button, the system displays a menu of actions that encompass the features of the Add, Delete, and Edit buttons.

Data Set Selection Window

Use this resizable window to select a data set to process by specifying a library and a SAS data set or view. These selections can be made by typing, by selecting from lists, or by a combination of the two. In addition, you can control the time ID variable and time interval, and you can browse the data set.



Access this window by using the Browse button to the right of the Data Set field in the Time Series Forecasting, Automatic Model Fitting, and Produce Forecasts windows. It functions in the same way as the Series Selection window, except that it does not allow you to select or view a time series variable.

Controls and Fields

`Library`
: is a SAS libname assigned within the current SAS session. If you know the libname associated with the data set of interest, you can type it in this field. If it is a valid choice, it will appear in the libraries list and will be highlighted. The SAS Data Sets list will be populated with data sets associated with that libname. See also Libraries under Selection Lists.

`Data Set`
: is the name of a SAS data set (data file or data view) that resides under the selected libname. If you know the name, you can type it in and press Return. If it is a valid choice, it will appear in the SAS Data Sets list and will be highlighted.

`Time ID`
: is the name of the ID variable for the selected input data set. To specify the ID variable, you can type the ID variable name in this field or select the control arrows to the right of the field.

Time ID `Select` button
: opens the Time ID Variable Specification window.

Time ID `Create` button
: opens a menu of methods for creating a time ID variable for the input data set. Use this feature if the data set does not already contain a valid time ID variable.

`Interval`
: is the time interval between observations (data frequency) in the selected data set. If the interval is not automatically identified by the system, you can type in the interval name or select it from a list by clicking the combo box arrow. For more information about intervals, see Chapter 4, "Date Intervals, Formats, and Functions," in this book.

`OK`
: closes the Data Set Selection window and makes the selected data set the current input data set.

`Cancel`
: closes the window without applying any selections made.

`Table`
: opens a Viewtable window for browsing the selected data set.

`Reset`
: resets the fields to their initial values upon entry to the window.

`Refresh`
: updates all fields and lists in the window. If you assign a new libname without exiting the Data Set Selection window, use the refresh action to update the Libraries list so that it will include the newly assigned libname.

Selection Lists

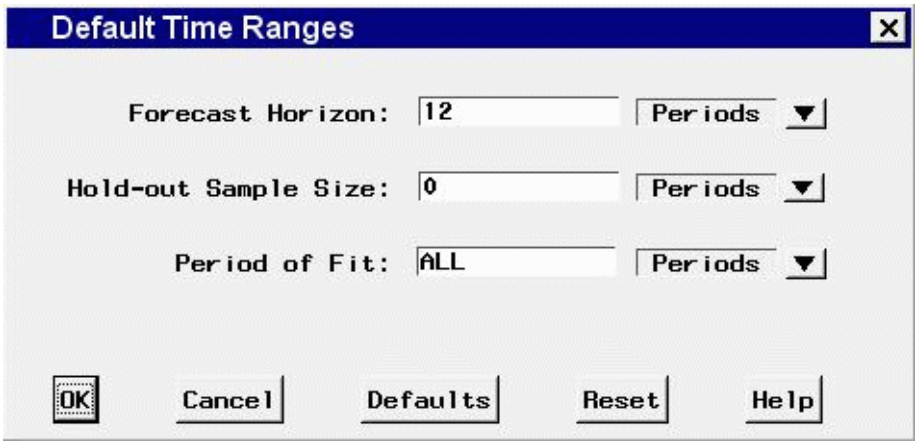
`Libraries`
: displays a list of currently assigned libnames. You can select a libname by clicking it with the left mouse button, which is equivalent to typing its name in the Library field.

  If you cannot locate the library or directory you are interested in, go to the SAS Explorer window, select "New" from the File menu, then select "Library" and "OK." This opens the New Library window. You also assign a libname by submitting a libname statement from the Editor window. Click the Refresh button to make the new libname available in the libraries list.

`SAS Data Sets`
: displays a list of the SAS data sets (data files or data views) contained in the selected library. You can select one of these by clicking with the left mouse button, which is equivalent to typing its name in the Data set field. You can double-click a data set name to select it and exit the window.

Default Time Ranges Window

Use the Default Time Ranges window to control how the period of fit and evaluation and the forecasting horizon are determined for each series when you do not explicitly set these ranges for a particular series. Invoke this window from the Options menu of the Develop Models, Automatic Model Fitting, Produce Forecasts, and Manage Forecasting Project windows. The settings you make in this window affect subsequently selected series; they do not alter the time ranges of series you have already selected.



Controls and Fields

`Forecast Horizon`
specifies the forecast horizon as either a number of periods or years from the last nonmissing data value or as a fixed date. You can type a number or date value in this field. Date value must be entered in a form recognized by a SAS date informat. (For information about SAS date informats, see *SAS Language Reference: Concepts*.)

`Forecast Horizon Units`
indicates whether the value in the forecast horizon field represents periods or years or a date. Click the arrow and select one from the pop-up list.

`Hold-out Sample Size`
specifies that a number of observations, number of years, or percent of the data at the end of the data range be used for the period of evaluation with the remainder of data used as the period of fit.

`Hold-out Sample Size Units`
indicates whether the hold-out sample size represents periods or years or percent of data range.

`Period of Fit`
specifies how much of the data range for a series is to be used as the period of fit for models fit to the series. ALL indicates that all the available data is used. You can specify a number of periods, number of years, or a fixed date, depending on the value of the units field to the right. When you specify a date, the start of the period of fit is the specified date or the first nonmissing series value, whichever is more recent. Date value must be entered in a form recognized by a SAS date informat. (For information about SAS date informats, see *SAS Language Reference: Concepts*.) When you specify the number of

periods or years, the start of the period of fit is computed as the date that number of periods or years from the end of the data.

`Period of Fit Units`
indicates whether the period-of-fit value represents periods or years or a date.

`OK`
closes the window and stores the specified changes.

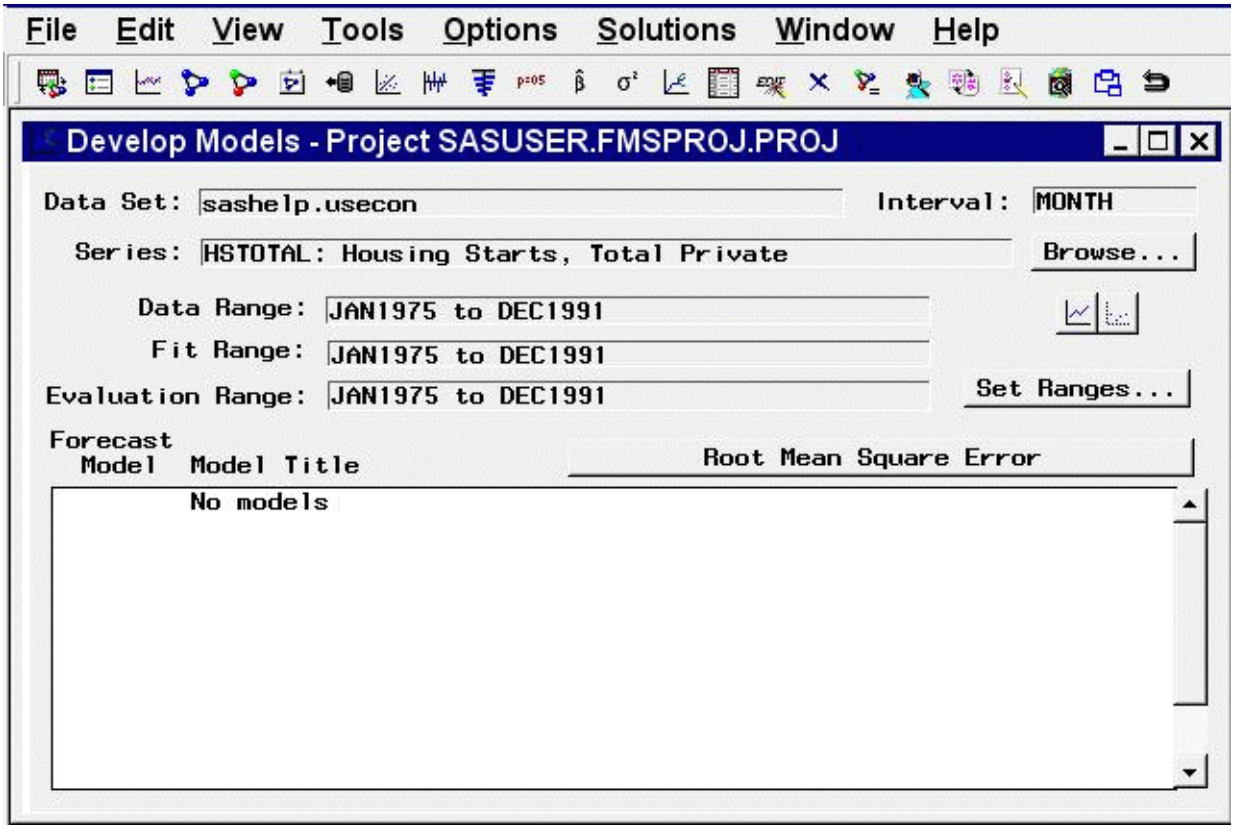
`Cancel`
closes the window without saving changes. Any options you specified are lost.

`Defaults`
resets all options to their default values.

`Reset`
resets the options to their initial values upon entry to the window.

Develop Models Window

This resizable window provides access to all of the Forecasting System's interactive model fitting and graphical tools. Use it to fit forecasting models to an individual time series and choose the best model to use to produce the final forecasts of the series. Invoke this window by using the Develop Models button in the Time Series Forecasting window.



Controls and Fields

`Data Set`
: is the name of the current input data set.

`Interval`
: is the time interval (data frequency) for the input data set.

`Series`
: is the variable name and label of the current time series.

`Browse` button
: opens the Series Selection window to enable you to change the current input data set or series.

`Data Range`
: is the date of the first and last nonmissing data values available for the current series in the input data set.

`Fit Range`
: is the current period of fit setting. This is the range of data that will be used to fit models to the series.

`Evaluation Range`
: is the current period of evaluation setting. This is the range of data that will be used to calculate the goodness-of-fit statistics for models fit to the series.

`Set Ranges` button
: opens the Time Ranges Specification window to enable you to change the fit range or evaluation range. Note: A new fit range is applied when new models are fit or when existing models are refit. A new evaluation range is applied when new models are fit or when existing models are refit or reevaluated. Changing the ranges does not automatically refit or reevaluate any models in the table: Use the Refit Models or Reevaluate Models items under the Edit menu.

`View Series Graphically` icon
: opens the Time Series Viewer window to display plots of the current series.

`View Selected Model Graphically` icon
: opens the Model Viewer to display graphs and tables for the currently highlighted model.

`Forecast Model`
: is the column of the model table that contains check boxes to select which model is used to produce the final forecasts for the current series.

`Model Title`
: is the column of the model table that contains the descriptive labels of the forecasting models fit to the current series.

`Root Mean Square Error` (or other statistic name) button
: is the button above the right side of the table. It displays the name of the current model selection criterion: a statistic that measures how well each model in the table fits the values of the current series for observations within the evaluation range. Clicking this button opens the Model Selection Criterion window to let you to select a different statistic. When you select a statistic, the model table the Develop Models window is updated to show current values of that statistic.

Menu Bar

`File`

`New Project`
opens a dialog box that lets you create a new project, assign it a name and description, and make it the active project.

`Open Project`
opens a dialog box that lets you select and load a previously saved project.

`Save Project`
saves the current state of the system (including all the models fit to a series) to the current project catalog entry.

`Save Project as`
saves the current state of the system with a prompt for the name of the catalog entry in which to store the information.

`Clear Project`
clears the system, deleting all the models for all series.

`Save Forecast`
writes forecasts from the currently highlighted model to an output data set.

`Save Forecast As`
prompts for an output data set name and saves the forecasts from the currently highlighted model.

`Output Forecast Data Set`
opens a dialog box for specifying the default data set used when you select “Save Forecast.”

`Import Data`
is available if you license SAS/ACCESS software. It opens an Import Wizard, which you can use to import your data from an external spreadsheet or database to a SAS data set for use in the Time Series Forecasting System.

`Export Data`
is available if you license SAS/ACCESS software. It opens an Export Wizard, which you can use to export a SAS data set, such as a forecast data set created with the Time Series Forecasting System, to an external spreadsheet or data base.

`Print Setup`
opens the Print Setup window, which enables you to access your operating system print setup.

`Close`
closes the Develop Models window and returns to the main window.

Edit

Fit Model

Automatic Fit
invokes the automatic model selection process.

Select From List
opens the Models to Fit window.

Smoothing Model
opens the Smoothing Model Specification window.

ARIMA Model
opens the ARIMA Model Specification window.

Custom Model
opens the Custom Model Specification window.

Combine Forecasts
opens the Forecast Combination Model Specification window.

External Forecasts
opens the External Forecast Model Specification window.

Edit Model
enables you to modify the specification of the currently highlighted model in the table and fit the modified model. The new model replaces the current model in the table.

Delete Model
deletes the currently highlighted model from the model table.

Refit Models

All Models
refits all models in the table by using data within the current fit range.

Selected Model
refits the currently highlighted model by using data within the current fit range.

Reevaluate Models

All Models
recomputes statistics of fit for all models in the table by using data within the current evaluation range.

Selected Model
recomputes statistics of fit for the currently highlighted model by using data within the current evaluation range.

View

Project
opens the Manage Forecasting Project window.

`Data Set`
: opens a Viewtable window to display the current input data set.

`Series`
: opens the Time Series Viewer window to display plots of the current series. This has the same function as the View Series Graphically icon.

`Model Predictions`
: opens the Model Viewer to display a predicted versus actual plot for the currently highlighted model. This has the same function as the View Selected Model Graphically icon.

`Prediction Errors`
: opens the Model Viewer to display the prediction errors for the currently highlighted model.

`Prediction Error Autocorrelations`
: opens the Model Viewer to display the prediction error autocorrelations, partial autocorrelations, and inverse autocorrelations for the currently highlighted model.

`Prediction Error Tests`
: opens the Model Viewer to display graphs of white noise and stationarity tests on the prediction errors of the currently highlighted model.

`Parameter Estimates`
: opens the Model Viewer to display the parameter estimates table for the currently highlighted model.

`Statistics of Fit`
: opens the Model Viewer window to display goodness-of-fit statistics for the currently highlighted model.

`Forecast Graph`
: opens the Model Viewer to graph the forecasts for the currently highlighted model.

`Forecast Table`
: opens the Model Viewer to display forecasts for the currently highlighted model in a table.

`Tools`

`Diagnose Series`
: opens the Series Diagnostics window to determine the kinds of forecasting models appropriate for the current series.

`Define Interventions`
: opens the Interventions for Series window to enable you to edit or add intervention effects for use in modeling the current series.

`Sort Models`
: sorts the models in the table by the values of the currently displayed fit statistic.

`Compare Models`
: opens the Model Fit Comparison window to display fit statistics for selected pairs of forecasting models. This is unavailable if there are fewer than two models in the table.

Generate Data
: opens the Time Series Simulation window. This window enables you to simulate ARIMA time series processes and is useful for educational exercises or testing the system.

Options

Time Ranges
: opens the Time Ranges Specification window to enable you to change the fit and evaluation time ranges and the forecast horizon. This has the same function as the Set Ranges button.

Default Time Ranges
: opens the Default Time Ranges window to enable you to control how the system sets the time ranges for series when you do not explicitly set time ranges with the Time Ranges Specification window. Settings made by using this window do not affect series you are already working with; they take effect when you select a new series.

Model Selection List
: opens the Model Selection List editor window. Use this action to edit the set of forecasting models considered by the automatic model selection process and displayed by the Models to Fit window.

Model Selection Criterion
: opens the Model Selection Criterion window, which presents a list of goodness-of-fit statistics and enables you to select the fit statistic that is displayed in the table and used by the automatic model selection process to determine the best fitting model. This has the same function as the button above the table that displays the name of the current model selection criterion.

Statistics of Fit
: opens the Statistics of Fit Selection window, which presents a list of statistics that the system can display. Use this action to customize the list of statistics shown in the Model Viewer, Automatic Model Fitting Results, and Model Fit Comparison windows and available for selection in the Model Selection Criterion menu.

Forecast Options
: opens the Forecast Options window, which enables you to control the widths of forecast confidence limits and control the kind of predicted values computed for models that include series transformations.

Alignment of Dates

Beginning
: aligns dates that the system generates to identify forecast observations in output data sets to the beginning of the time intervals.

Middle
: aligns dates that the system generates to identify forecast observations in output data sets to the midpoints of the time intervals.

End
: aligns dates that the system generates to identify forecast observations in output data sets to the end of the time intervals.

`Automatic Fit`
: opens the Automatic Model Selection Options window, which enables you to control the number of models retained by the automatic model selection process and whether the models considered for automatic selection are subset according to the series diagnostics.

`Include Interventions`
: controls whether intervention effects defined for the current series are automatically added as predictors to the models considered by the automatic selection process and displayed by the Models to Fit window. When the Include Interventions option is selected, the series interventions are also automatically added to the predictors list when you specify a model in the ARIMA and Custom Models Specification windows. A check mark or filled check box next to this item indicates that the option is turned on.

`Print Audit Trail`
: prints to the SAS log information about the models fit by the system. A check mark or filled check box next to this item indicates that the audit option is turned on.

`Show Source Statements`
: controls whether SAS statements submitted by the forecasting system are printed in the SAS log. When the Show Source Statements option is selected, the system sets the SAS system option SOURCE before submitting SAS statements; otherwise, the system uses the NOSOURCE option. Note that only some of the functions performed by the forecasting system are accomplished by submitting SAS statements. A check mark or filled check box next to this item indicates that the option is turned on.

Left Mouse Button Actions for the Model Table

When the mouse pointer is over the description of a model in the table, the left mouse button selects (highlights) or deselects that model. On some computer systems, you can double-click to open the Model Viewer window for the selected model.

When the mouse pointer is over an empty part of the model table, the left mouse button opens a menu of model fitting choices. These choices are the same as those on the Fit Model submenu of the Edit menu.

Right Mouse Button Actions for the Model Table

When a model in the table is selected, the right mouse opens a menu of actions that apply to the highlighted model. The actions available from this menu are as follows.

`View Model`
: opens the Model Viewer for the selected model. This has the same function as the View Model Graphically icon.

`View Parameter Estimates`
: opens the Model Viewer to display the parameter estimates table for the currently highlighted model. This has the same function as the Parameter Estimates item on the View menu.

`View Statistics of Fit`
: opens the Model Viewer to display a table of goodness-of-fit statistics for the currently highlighted model. This has the same function as the Statistics of Fit item on the View menu.

`Edit Model`
: enables you to modify the specification of the currently highlighted model in the table and fit the modified model. This has the same function as the Edit Model item on the Edit menu.

`Refit Model`
: refits the highlighted model by using data within the current fit range. This has the same function as the Selected Model item on the Refit Models submenu of the Edit menu.

`Reevaluate Model`
: reevaluates the highlighted model by using data within the evaluation fit range. This has the same function as the Selected Model item on the Reevaluate Models submenu of the Edit menu.

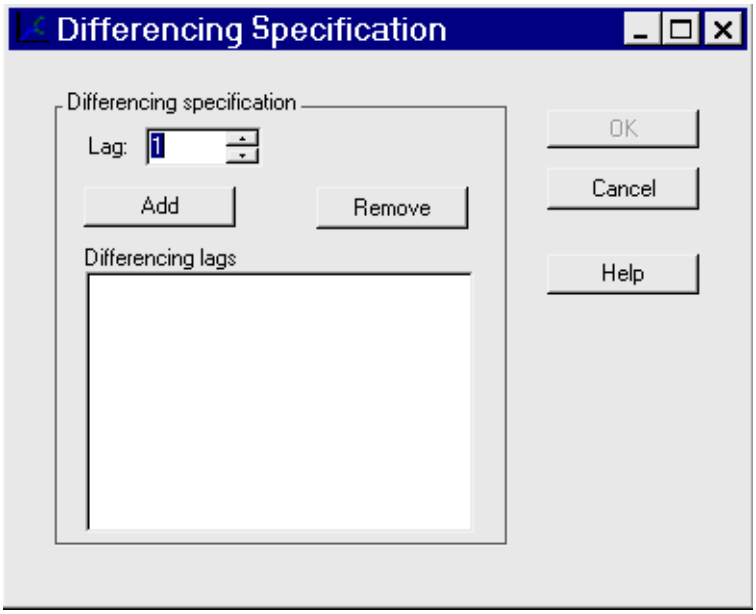
`Delete Model`
: deletes the currently highlighted model from the model table. This has the same function as the Delete Model item on the Edit menu.

`View Forecasts`
: opens the Model Viewer to display the forecasts for the currently highlighted model. This has the same function as the Forecast Graph item on the View menu.

When the model list is empty or when no model is selected, the right mouse button opens the same menu of model fitting actions as the left mouse button.

Differencing Specification Window

Use the Differencing Specification window to specify the list of differencing lags `d=(lag, ..., lag)` in a factored ARIMA model. To specify a first difference, add the value 1 (`d=(1)`). To specify a second difference (difference twice at lag 1), add the value 1 again (`d=(1,1)`). For first differencing at lags 1 and 12, use the values 1 and 12 (`d=(1,12)`).



Controls and Fields

`Lag`
specifies a lag value to add to the list. Type in a positive integer or select one by clicking the spin box arrows. Duplicates are allowed.

`Add`
adds the value in the `Lag` spin box to the list of differencing lags.

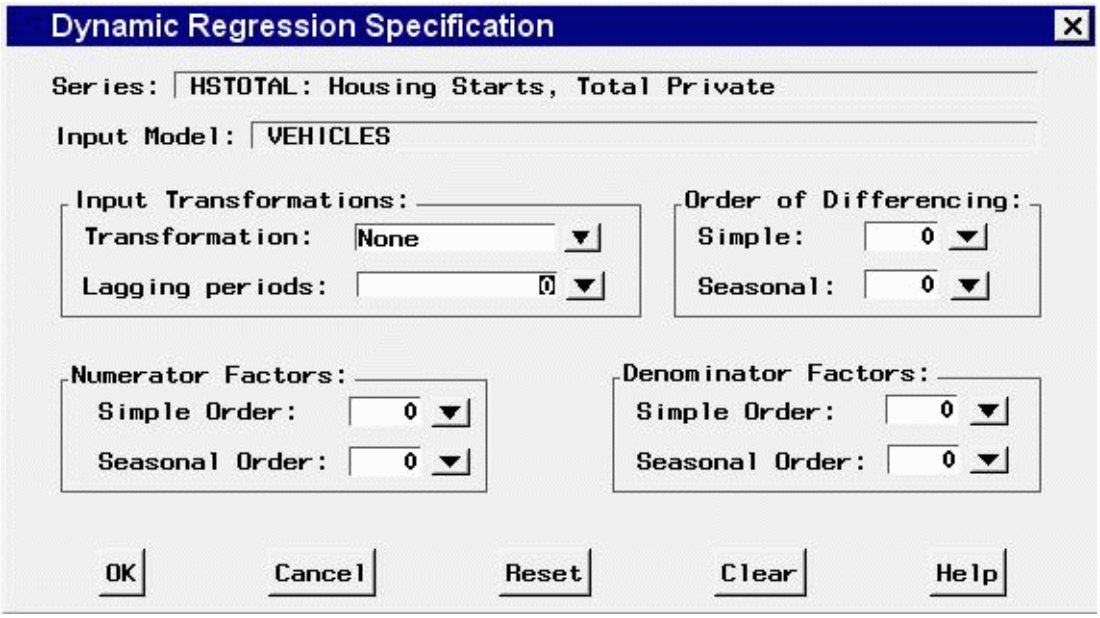
`Remove`
deletes a selected lag from the list of differencing lags.

`OK`
closes the window and returns the specified list to the Factored ARIMA Model Specification window.

`Cancel`
closes the window and discards any lags added to the list.

Dynamic Regression Specification Window

Use the Dynamic Regression Specification window to specify a dynamic regression or transfer function model for the effect of the predictor variable. It is invoked from the Dynamic Regressors Selection window.



Controls and Fields

`Series`
is the name and variable label of the current series.

`Input Model`
is a descriptive label for the dynamic regression model. You can type a label in this field or allow the

system to provide the label. If you leave the label blank, a label is generated automatically based on the options you specify. When no options are specified, the label is the name and variable label of the predictor variable.

`Input Transformation`
displays the transformation specified for the predictor variable. When a transformation is specified, the transfer function model is fit to the transformed input variable.

`Lagging periods`
is the pure delay in the effect of the predictor, *l*.

`Simple Order of Differencing`
is the order of differencing, *d*. Set this field to 1 to use the changes in the predictor variable.

`Seasonal Order of Differencing`
is the order of seasonal differencing, *D*. Set this field to 1 to difference the predictor variable at the seasonal lags—for example, to use the year-over-year or week-over-week changes in the predictor variable.

`Simple Order Numerator Factors`
is the order of the numerator factor of the transfer function, *p*.

`Seasonal Order Numerator Factors`
is the order of the seasonal numerator factor of the transfer function, *P*.

`Simple Order Denominator Factors`
is the order of the denominator factor of the transfer function, *q*.

`Seasonal Order Denominator Factors`
is the order of the seasonal denominator factor of the transfer function, *Q*.

`OK`
closes the window and adds the dynamic regression model specified to the model predictors list.

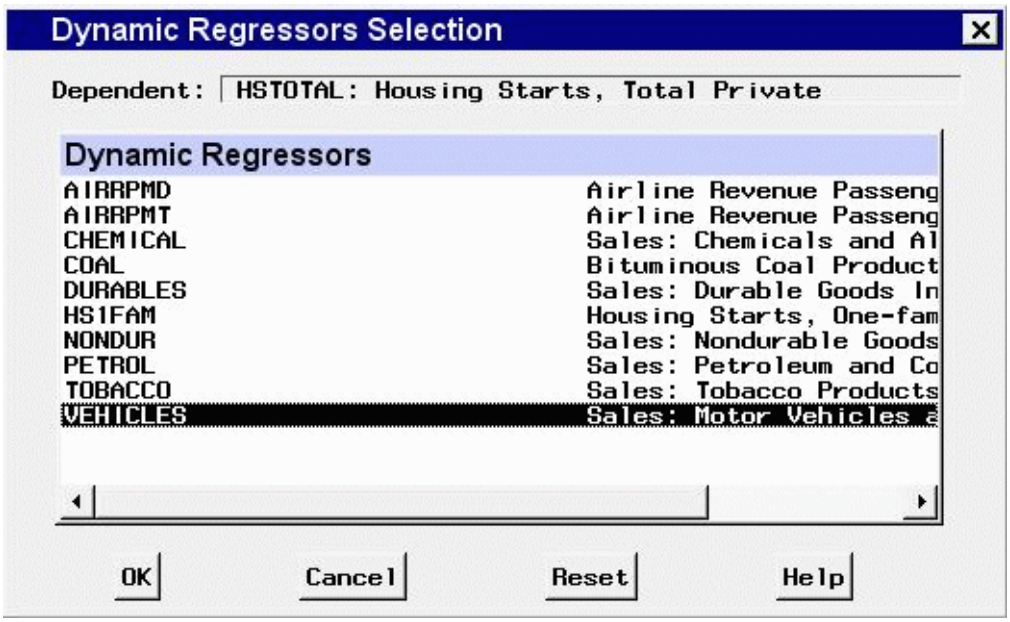
`Cancel`
closes the window without adding the dynamic regression model. Any options you specified are lost.

`Reset`
resets all options to their initial values upon entry to the window. This might be useful when editing a predictor specification; otherwise, Reset has the same function as Clear.

`Clear`
resets all options to their default values.

Dynamic Regressors Selection Window

Use the Dynamic Regressors Selection window to select an input variable as a dynamic regressor. Access this window from the pop-up menu that appears when you click the Add button in the ARIMA Model Specification window or Custom Model Specification window.



Controls and Fields

`Dependent`
: is the name and variable label of the current series.

`Dynamic Regressors`
: is a table listing the variables in the input data set. Select one variable in this list as the predictor series.

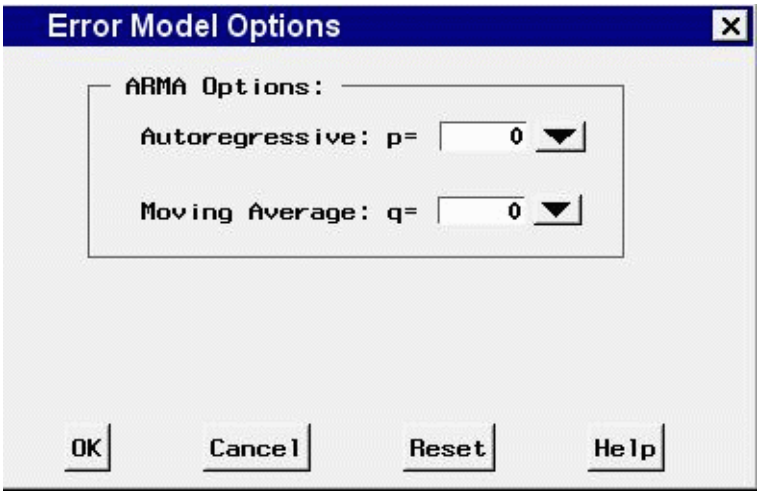
`OK`
: opens the Dynamic Regression Specification window for you to specify the form of the dynamic regression for the selected predictor series, and then closes the Dynamic Regressors Selection window and adds the specified dynamic regression to the model predictors list.

`Cancel`
: closes the window without adding the dynamic regression model. Any options you specified are lost.

`Reset`
: resets all options to their initial values upon entry to the window.

Error Model Options Window

Use the Error Model Options window to specify the autoregressive and moving-average orders for the residual autocorrelation part of a model defined by using the Custom Model Specification window. Access it by using the Set button in that window.



Controls and Fields

`ARIMA Options`
: Use these combo boxes to specify the orders of the ARIMA model. You can either type in a value or click the combo box arrow to select from a pop-up list.

  `Autoregressive`
  : defines the order of the autoregressive part of the model.

  `Moving Average`
  : defines the order of the moving-average term.

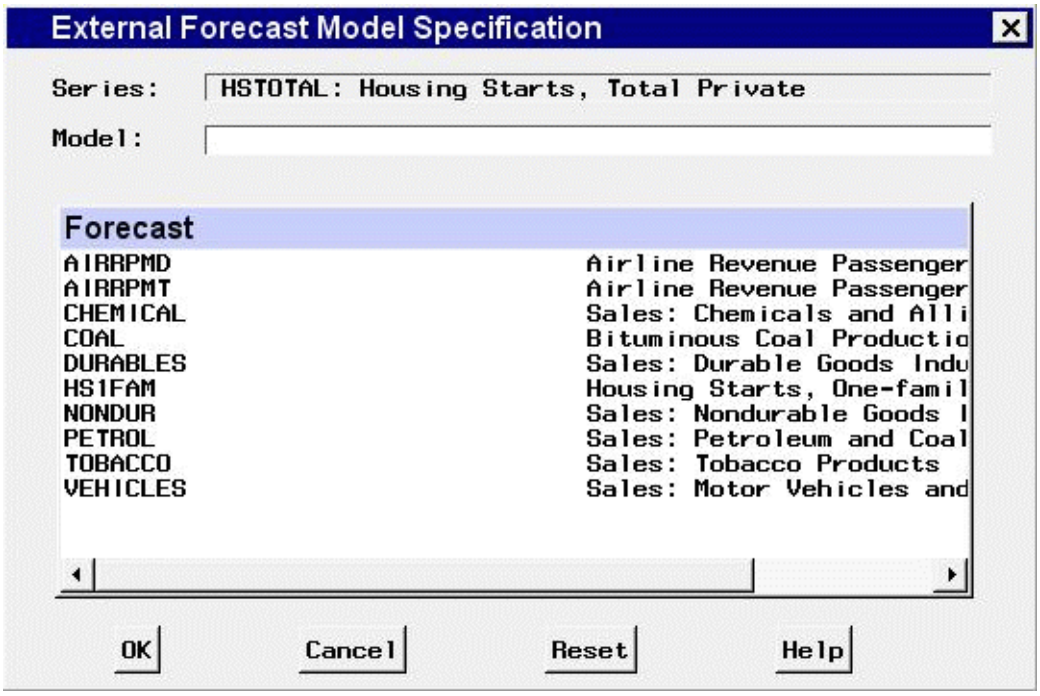
`OK`
: closes the Error Model Options window and returns to the Custom Model Specification window.

`Cancel`
: closes the Error Model Options window and returns to the Custom Model Specification window, discarding any changes made.

`Reset`
: resets all options to their initial values upon entry to the window.

External Forecast Model Specification Window

Use the External Forecast Model Specification window to add to the current project forecasts produced externally to the Time Series Forecasting System. To add an external forecast, select a variable from the selection list and click the OK button. The name of the selected variable will be added to the list of models fit, and the values of this variable will be used as the forecast. For more information, see “Incorporating Forecasts from Other Sources” in the “Specifying Forecasting Models” chapter.



Controls and Fields

`OK`
: closes the window and adds the external forecast to the project.

`Cancel`
: closes the window without adding an external forecast to the project.

`Reset`
: deselects any selection made in the selection list.

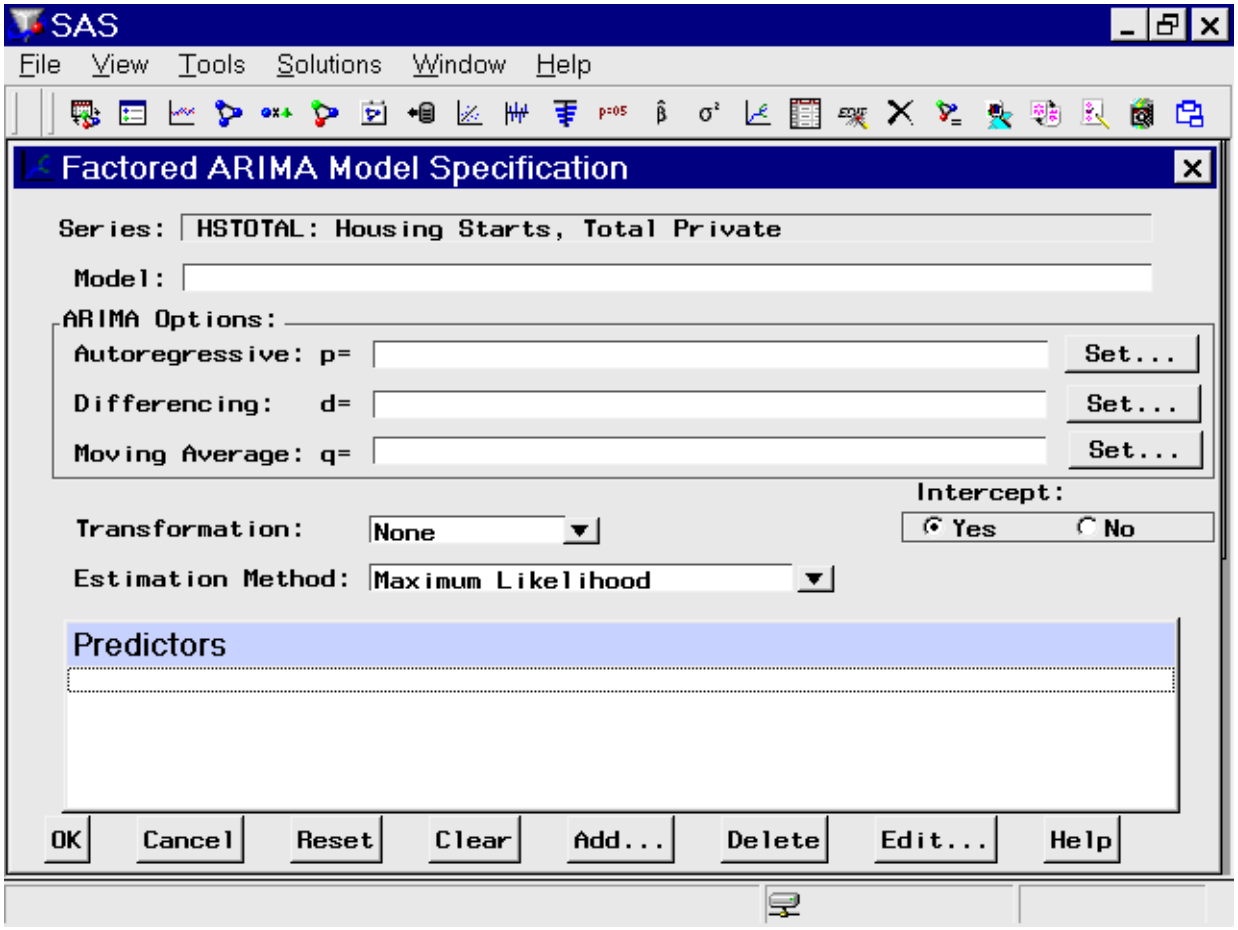
Factored ARIMA Model Specification Window

Use the ARIMA Model Specification window to specify an ARIMA model by using the notation:

```
p = (lag, ..., lag) ...(lag, ..., lag)
d = (lag, ..., lag)
q = (lag, ..., lag) ...(lag, ..., lag)
```

where p, d, and q represent autoregressive, differencing, and moving-average terms, respectively.

Access it from the Develop Models menu, where it is invoked from the Fit Model item under Edit on the menu bar, or from the pop-up menu when you click an empty area of the model table.



The Factored ARIMA Model Specification window is identical to the ARIMA Model Specification window, except that the p, d, and q terms are specified in a more general and less limited way. Only those controls and fields that differ from the ARIMA Model Specification window are described here.

Controls and Fields

`Model`
: is a descriptive label for the model. You can type a label in this field or allow the system to provide a label. If you leave the label blank, a label is generated automatically based on the p, d, and q terms that you specify. For example, if you specify `p=(1,2,3), d=(1), q=(12)` and no intercept, the model label is `ARIMA p=(1,2,3) d=(1) q=(12) NOINT`. For monthly data, this is equivalent to the model `ARIMA(3,1,0)(0,0,1)s NOINT` as specified in the ARIMA Model Specification window or the Custom Model Specification window.

`ARIMA Options`
: specifies the ARIMA model in terms of the autoregressive lags (p), differencing lags (d), and moving-average lags (q).

`Autoregressive`
: defines the autoregressive part of the model. Click the Set button to open the AR Polynomial Specification window, where you can add any set of autoregressive lags grouped into any number of factors.

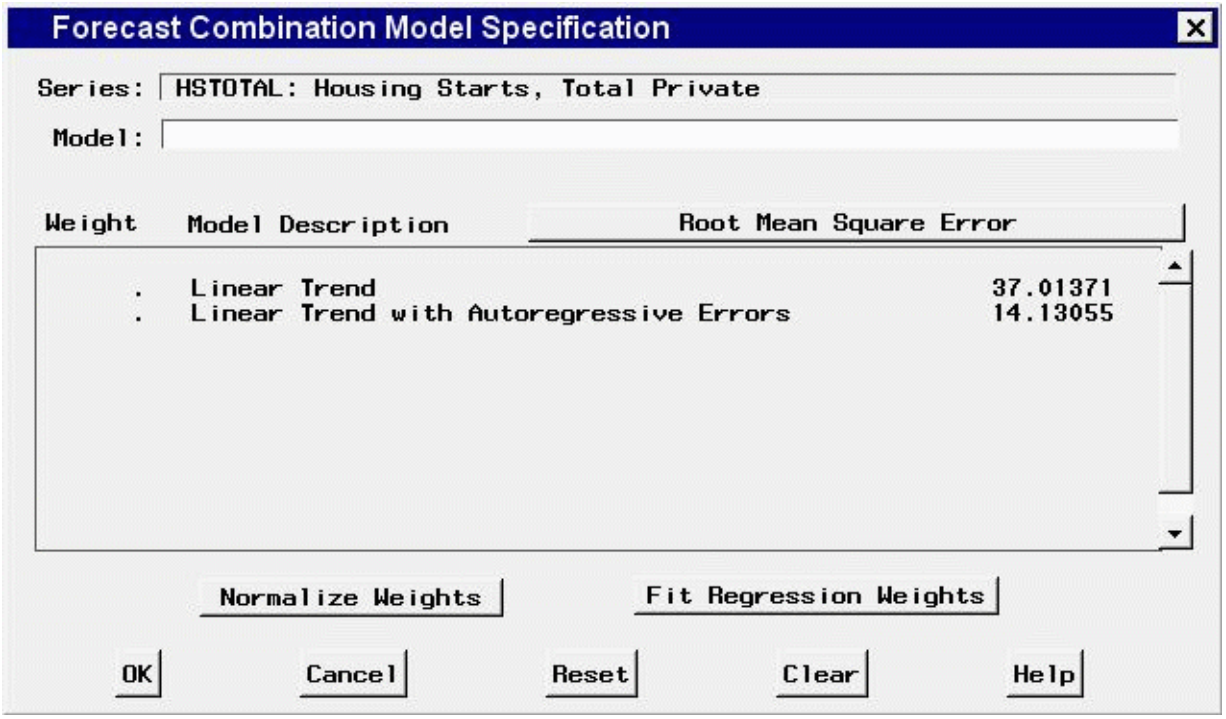
`Differencing`
: specifies differencing to be applied to the input data. Click the Set button to open the Differencing Specification window, where you can specify any set of differencing lags.

`Moving Average`
: defines the moving-average part of the model. Click the Set button to open the MA Polynomial Specification window, where you can add any set of moving-average lags grouped into any number of factors.

`Estimation Method`
: specifies the method used to estimate the model parameters. The Conditional Least Squares and Unconditional Least Squares methods generally require fewer computing resources and are more likely to succeed in fitting complex models. The Maximum Likelihood method requires more resources but provides a better fit in some cases. See also the section "Estimation Details" in Chapter 7, "The ARIMA Procedure."

Forecast Combination Model Specification Window

Use the Forecast Combination Model Specification window to produce forecasts by averaging the forecasts of two or more forecasting models. The specified combination of models is added to the model list for the series. Access this window from the Develop Models window whenever two or more models have been fit to the current series. It is invoked by selecting Combine Forecasts from the Fit Model submenu of the Edit menu, or from the pop-up menu which appears when you click an empty part of the model table.



Controls and Fields

`Series`
is the name and variable label of the current series.

`Model`
is a descriptive label for the model that you specify. You can type a label in this field or allow the system to provide a label. If you leave the label blank, a label is generated automatically based on the options you specify.

`Weight`
is a column of the forecasting model table that contains the weight values for each model. The forecasts for the combined model are computed as a weighted average of the predictions from the models in the table that use these weights. Models with missing weight values are not included in the forecast combination. You can type weight values in these fields or you can use other features of the window to set the weights.

`Model Description`
is a column of the forecasting model table that contains the descriptive labels of the forecasting models fit to the current series that are available for combination.

`Root Mean Square Error` (or other statistic name) button
is the button above the right side of the table. It displays the name of the current model selection criterion: a statistic that measures how well each model in the table fits the values of the current series for observations within the evaluation range. Clicking this button opens the Model Selection Criterion window to enable you to select a different statistic.

`Normalize Weights` button
replaces each nonmissing value in the Weights column with the current value divided by the sum of the weights. The resulting weights are proportional to original weights and sum to 1.

`Fit Regression Weights` button
computes weight values for the models in the table by regressing the series on the predictions from the models. The values in the Weights column are replaced by the estimated coefficients produced by this linear regression. If some weight values are nonmissing and some are missing, only models with nonmissing weight values are included in the regression. If all weights are missing, all models are used.

`OK`
closes the Forecast Combination Model Specification window and fits the model.

`Cancel`
closes the Forecast Combination Model Specification window without fitting the model. Any options you specified are lost.

`Reset`
resets all options to their initial values upon entry to the Forecast Combination Model Specification window. This might be useful when editing an existing model specification; otherwise, Reset has the same function as Clear.

`Clear`
resets all options to their default values.

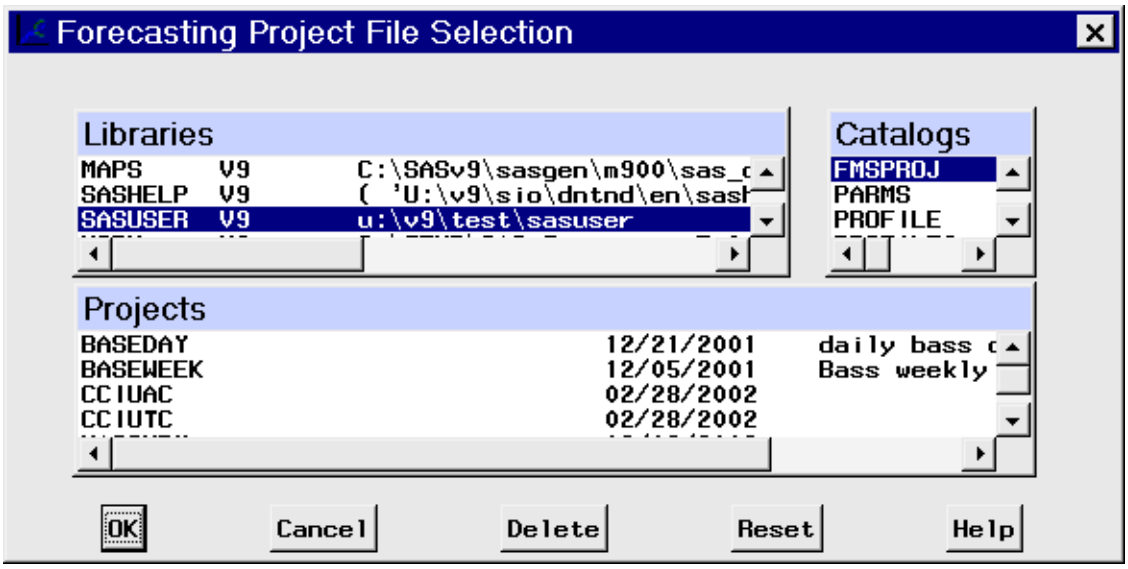
Mouse Button Actions

You can select or deselect models for inclusion in the combination model by positioning the mouse pointer over the model description and pressing the left mouse button. When you select a model in this way, the weights are automatically updated.

The newly selected model is given a weight equal to the average weight of the previously selected models, and all the nonmissing weights are normalized to sum to 1. When you use the mouse to remove a model from the combination, the weight of the deselected model is set to missing and the remaining nonmissing weights are normalized to sum to 1.

Forecasting Project File Selection Window

Use the Forecasting Project File Selection window to locate and load a previously stored forecasting project. Access it from the project Browse button in the Manage Forecasting Project window or the Time Series Forecasting window or from the Open Project item on the File menu of the Develop Models window.



Selection Lists

`Libraries`
: is a list of currently assigned libraries. When you select a library from this list, the catalogs in that library are shown in the catalog selection list.

`Catalogs`
: is a list of catalogs contained in the currently selected library. When you select a catalog from this list, any forecasting project entries stored in that catalog are shown in the projects selection list.

`Projects`
: is a list of forecasting project entries contained in the currently selected catalog.

Controls and Fields

`OK`
: closes the window and opens the selected project.

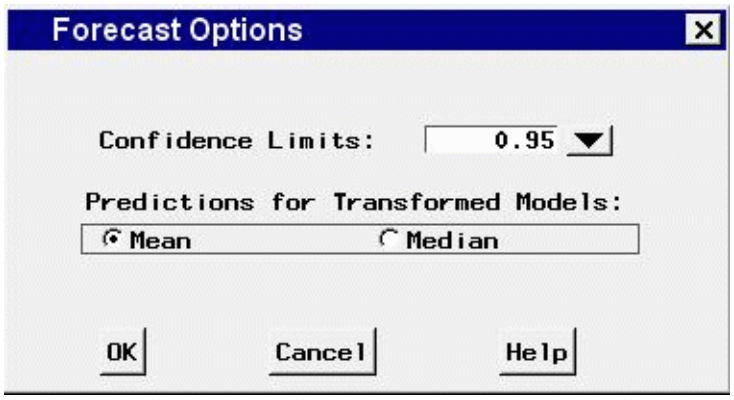
`Cancel`
: closes the window without selecting a project.

`Delete`
: deletes the selected project file.

`Reset`
: restores selections to those which were set before the window was opened.

Forecast Options Window

Use the Forecast Options window to set options to control how forecasts and confidence limits are computed. It is available from the Forecast Options item in the Options menu of the Develop Models window, Automatic Model Fitting window, Produce Forecasts, and Manage Projects windows.



Controls and Fields

`Confidence Limits`
: specifies the size of the confidence limits for the forecast values. For example, a value of 0.95 specifies 95% confidence intervals. You can type in a number or select from the pop-up list.

`Predictions for transformed models`
: controls how forecast values are computed for models that employ a series transformation. See the section Predictions for Transformed Models in Chapter 63, "Forecasting Process Details," for more information. The values are as follows.

  `Mean`
  : specifies that forecast values be predictions of the conditional mean of the series.

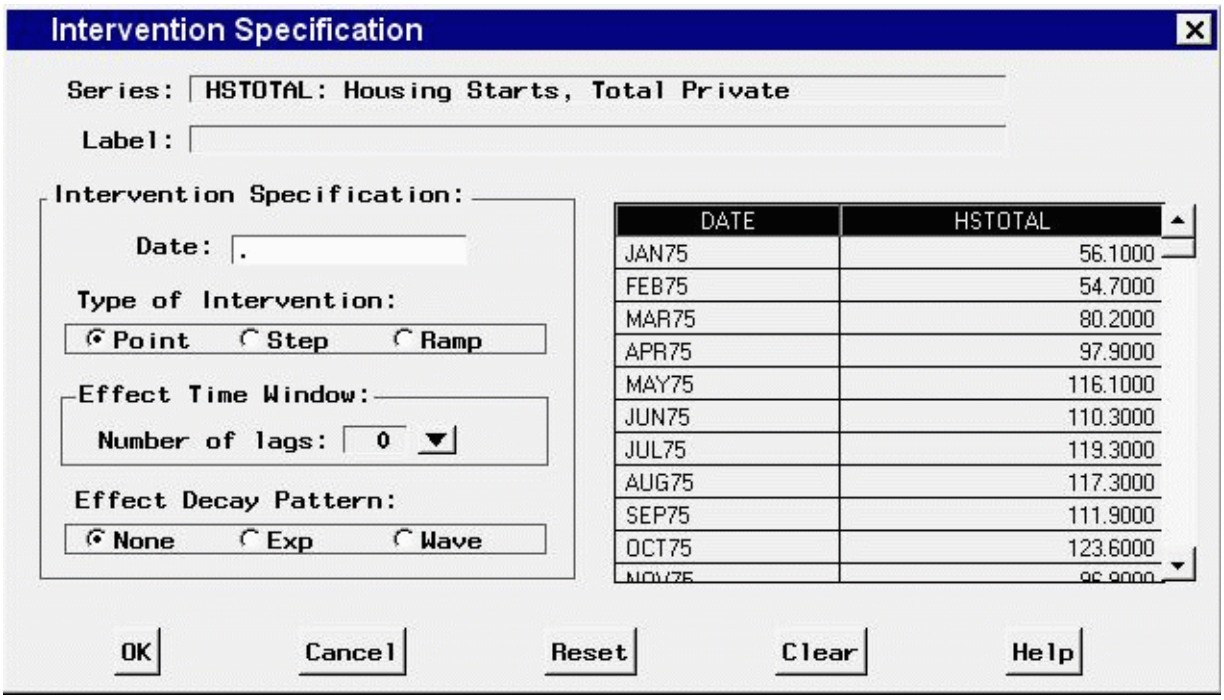
  `Median`
  : specifies that forecast values be predictions of the conditional median of the series.

`OK`
closes the window and saves the option settings you specified.

`Cancel`
closes the window without changing the forecast options. Any options you specified are lost.

Intervention Specification Window

Use the Intervention Specification window to specify intervention effects to model the impact on the series of unusual events. Access it from the Intervention for Series window. For more information, see the section "Interventions" on page 3907.



Controls and Fields

`Series`
is the name and variable label of the current series.

`Label`
is a descriptive label for the intervention effect that you specify. You can type a label in this field or allow the system to provide the label. If you leave the label blank, a label is generated automatically based on the options you specify.

`Date`
is the date that the intervention occurs. You can type a date value in this field, or you can set the date by selecting a row of the data table on the right side of the window.

`Type of Intervention`

`Point`
specifies that the intervention variable is zero except for the specified date.

`Step`
specifies that the intervention variable is zero before the specified date and a constant 1.0 after the date.

`Ramp`
specifies that the intervention variable is an increasing linear function of time after the date of the intervention and zero before the intervention date.

`Number of lags`
specifies the numerator order for the transfer function model for the intervention effect. Select a value from the pop-up list.

`Effect Decay Pattern`
specifies the denominator order for the transfer function model for the intervention effect. The value "Exp" specifies a single lag denominator factor; the value "Wave" specifies a two-lag denominator factor.

`OK`
closes the window and adds the intervention effect specified to the series interventions list.

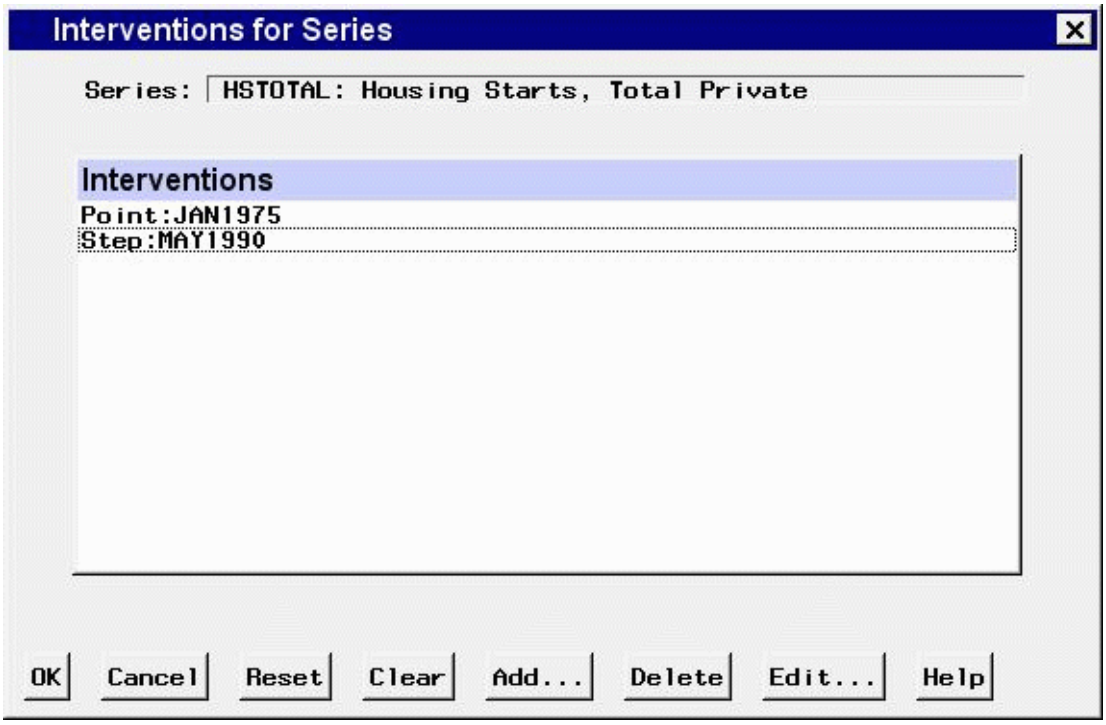
`Cancel`
closes the window without adding the intervention. Any options you specified are lost.

`Reset`
resets all options to their initial values upon entry to the window. This might be useful when editing an intervention specification; otherwise, Reset has the same function as Clear.

`Clear`
resets all options to their default values.

Interventions for Series Window

Use the Interventions for Series window to create and edit a list of intervention effects to model the impact on the series of unusual events and to select intervention effects as predictors for forecasting models. Access it from the Add button pop-up menu of the ARIMA Model Specification or Custom Model Specification window, or by selecting Define Interventions from the Tools in the Develop Models window. For more information, see the section "Interventions" on page 3907.



Controls and Fields

`Series`
: is the name and variable label of the current series.

`OK`
: closes the window. If you access this window from the ARIMA Model Specification window or the Custom Model Specification window, any interventions that are selected (highlighted) in the list are added to the model. If you access this window from the Tools menu, all interventions in the list are saved for the current series.

`Cancel`
: closes the window without returning a selection or changing the interventions list. Any options you specified are lost.

`Reset`
: resets the list as it was on entry to the window.

`Clear`
: deletes all interventions from the list.

`Add`
: opens the Intervention Specification window to specify a new intervention effect and add it to the list.

`Delete`
: deletes the currently selected (highlighted) entries from the list.

`Edit`
: opens the Intervention Specification window to edit the currently selected (highlighted) intervention.

Mouse Button Actions

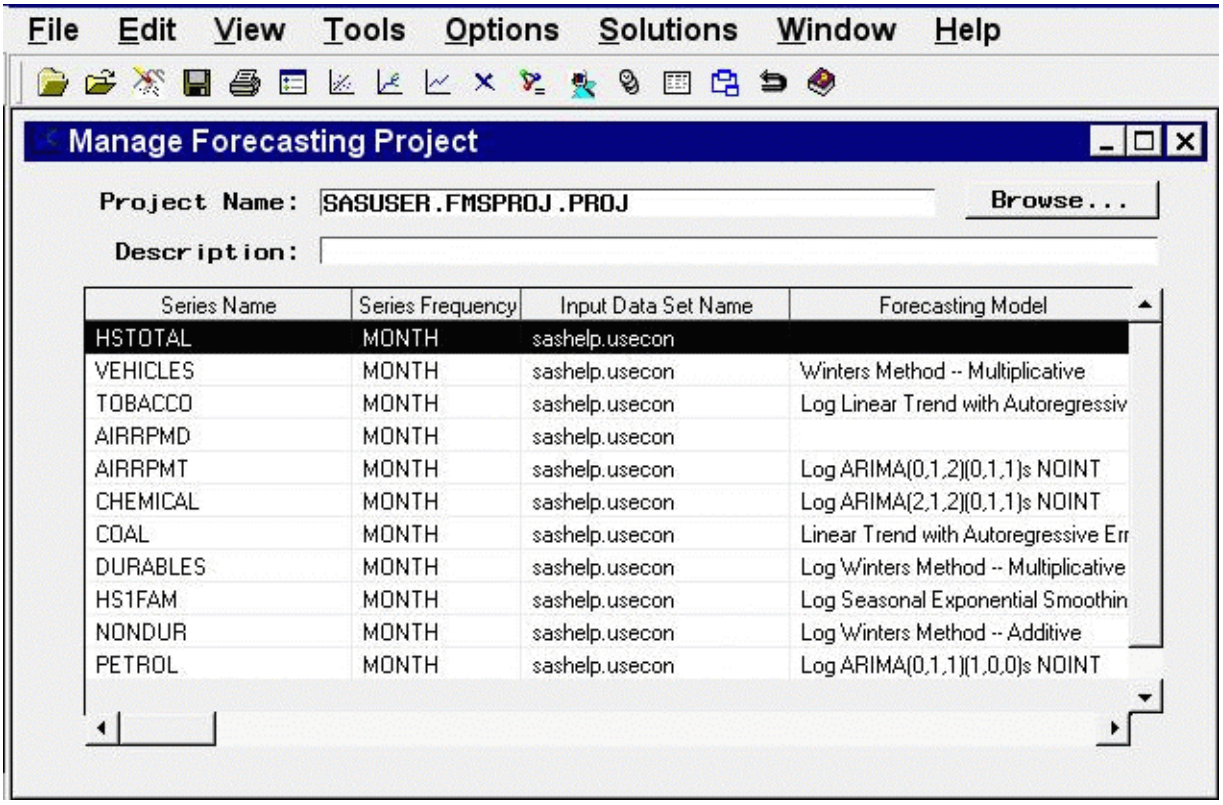
To select or deselect interventions, position the mouse pointer over the intervention's label in the Interventions list and press the left mouse button.

When you position the mouse pointer in the Interventions list and press the right mouse button, a menu containing the actions Add, Delete, and Edit appears. These actions are the same as clicking the Add, Delete, and Edit buttons.

Double-clicking on an intervention in the list invokes an Edit action for that intervention specification.

Manage Forecasting Project Window

Use this resizable window to work with collections of series, models, and options called *projects*. The window contains a project name, a description field, and a table of information about all the series for which you have fit forecasting models. Access it by using the Manage Projects button in the Time Series Forecasting window.



Controls and Fields

`Project Name`
: is the name of the SAS catalog entry in which forecasting models and other results will be stored and from which previously stored results are loaded into the forecasting system. You can specify the project

by typing a SAS catalog entry name in this field or by selecting the Browse button to the right of this field. If you specify the name of an existing catalog entry, the information in the project file is loaded. If you specify a one-level name, it is assumed to be the name of a project in the "fmsproj" catalog in the "sasuser" library. For example, typing `samproj` is equivalent to typing `sasuser.fmsproj.samproj`.

project `Browse` button
opens the Forecasting Project File Selection window to enable you to select and load the project from a list of previously stored project files.

`Description`
is a descriptive label for the forecasting project. The description you type in this field will be stored with the catalog entry shown in the Project field if you save the project.

Series List Table

The table of series for which forecasting models have been fit contains the following columns.

`Series Name`
is the name of the time series variable represented in the given row of the table.

`Series Frequency`
is the time interval (data frequency) for the time series.

`Input Data Set Name`
is the input data set that provided the data for the series.

`Forecasting Model`
is the descriptive label for the forecasting model selected for the series.

`Statistic Name`
is the statistic of fit for the forecasting model selected for the series.

`Number of Models`
is the total number of forecasting models fit to the series. If there is more than one model for a series, use the Model List window to see a list of models.

`Series Label`
is the variable label for the series.

`Time ID Variable Name`
is the time ID variable for the input data set for the series.

`Series Data Range`
is the time range of the nonmissing values of the series.

`Model Fit Range`
is the period of fit used for the series.

`Model Evaluation Range`
is the evaluation period used for the series.

`Forecast Range`
is the forecast period set for the series.

Menu Bar

File

New
: opens a dialog box that lets you create a new project, assign it a name and description, and make it the active project.

Open
: opens a dialog box that lets you select and load a previously saved project.

Close
: closes the Manage Forecasting Project window and returns to the main window.

Save
: saves the current state of the system (including all the models fit to a series) to the current project catalog entry.

Save As
: saves the current state of the system with a prompt for the name of the catalog entry in which to store the information.

Save to Data Set
: saves the current project file information in a SAS data set. The contents of the data set are the same as the information displayed in the series list table.

Delete
: deletes the current project file.

Import Data
: is available if you license SAS/ACCESS software. It opens an Import Wizard, which you can use to import your data from an external spreadsheet or database to a SAS data set for use in the Time Series Forecasting System.

Export Data
: is available if you license SAS/ACCESS software. It opens an Export Wizard, which you can use to export a SAS data set, such as a forecast data set created with the Time Series Forecasting System, to an external spreadsheet or database.

Print
: prints the current project file information.

Print Setup
: opens the Print Setup window, which allows you to access your operating system print setup.

Edit

Delete Series
: deletes all models for the selected (highlighted) row of the table and removes the series from the project.

`Clear`
resets the system, deleting all series and models from the project.

`Reset`
restores the Manage Forecasting Project window to its initial state.

`View`

`Data Set`
opens a Viewtable window to display the input data set for the selected (highlighted) series.

`Series`
opens the Time Series Viewer window to display plots of the selected (highlighted) series.

`Model`
opens the Model Viewer window to show the current forecasting model for the selected series.

`Forecast`
opens the Model Viewer to display plots of the forecasts produced by the forecasting model for the selected (highlighted) series.

`Tools`

`Diagnose Series`
opens the Series Diagnostics window to perform the automatic series diagnostic process to determine the kinds of forecasting models appropriate for the selected (highlighted) series.

`List Models`
opens the Model List window for the selected (highlighted) series, which displays a list of all the models that you fit for the series. This action is the same as double-clicking the mouse on the table row.

`Generate Data`
opens the Time Series Simulation window. This window enables you to simulate ARIMA time series processes and is useful for educational exercises or testing the system.

`Refit Models`

`All Series`
refits all the models for all the series in the project by using data within the current fit range.

`Selected Series`
refits all the models for the currently highlighted series by using data within the current fit range.

Reevaluate Models

All Series
reevaluates all the models for all the series in the project by using data within the current evaluation fit range.

Selected Series
reevaluates all the models for the currently highlighted series by using data within the current evaluation range.

Options

Time Ranges
opens the Time Ranges Specification window to enable you to change the fit and evaluation time ranges and the forecast horizon.

Default Time Ranges
opens the Default Time Ranges window to enable you to control how the system sets the time ranges for series when you do not explicitly set time ranges with the Time Ranges Specification window. Settings made by using this window do not affect series you are already working with; they take effect when you select a new series.

Model Selection List
opens the Model Selection List editor window. Use this to edit the set of forecasting models considered by the automatic model selection process and displayed by the Models to Fit window.

Statistics of Fit
opens the Statistics of Fit Selection window, which controls which of the available statistics will be displayed.

Forecast Options
opens the Forecast Options window, which enables you to control the widths of forecast confidence limits and control the kind of predicted values computed for models that include series transformations.

Column Labels
enables you to set long or short column labels. Long labels are used by default.

Include Interventions
controls whether intervention effects defined for the current series are automatically added as predictors to the models considered by the automatic selection process and displayed by the Model Selection List editor window. When the Include Interventions option is selected, the series interventions are also automatically added to the predictors list when you specify a model in the ARIMA and Custom Models Specification windows.

Print Audit Trail
prints to the SAS log information about the models fit by the system. A check mark or filled check box next to this item indicates that the audit option is turned on.

Show Source Statements
controls whether SAS statements submitted by the forecasting system are printed in the SAS log. When the Show Source Statements option is selected, the system sets the SAS system option

SOURCE before submitting SAS statements; otherwise, the system uses the NOSOURCE option. Note that only some of the functions performed by the forecasting system are accomplished by submitting SAS statements. A check mark or filled check box next to this item indicates that the option is turned on.

Left Mouse Button Actions

If you select a series in the table by positioning the mouse pointer over the table row and clicking with the left mouse button once, that row of the table is highlighted. Menu bar actions such as Delete Series will apply to the highlighted row of the table.

If you select a series in the table by positioning the mouse pointer over the table row and double-clicking with the left mouse button, the system opens the Model List window for that series, which displays a list of all the models that you fit for the series. This has the same function as the List Models item under Tools on the menu bar.

Right Mouse Button Actions

Clicking the right mouse button invokes a pop-up menu of actions applicable to the highlighted series. The actions in this menu are as follows:

`Delete Series`
: deletes the highlighted series and its models from the project. This has the same function as the Delete Series item on the Edit menu.

`Refit All Models`
: refits all models attached to the highlighted series by using data within the current fit range. This has the same function as the Selected Series item under Refit Models on the Tools menu.

`Reevaluate All Models`
: reevaluates all models attached to the highlighted series by using data within the current evaluation range. This has the same function as the Selected Series item under Reevaluate Models on the Tools menu.

`List Models`
: invokes the Model List window. This has the same function as List Models on the Tools menu.

`View Series`
: opens the Time Series Viewer window to display plots of the highlighted series. This has the same function as the Series item on the View menu.

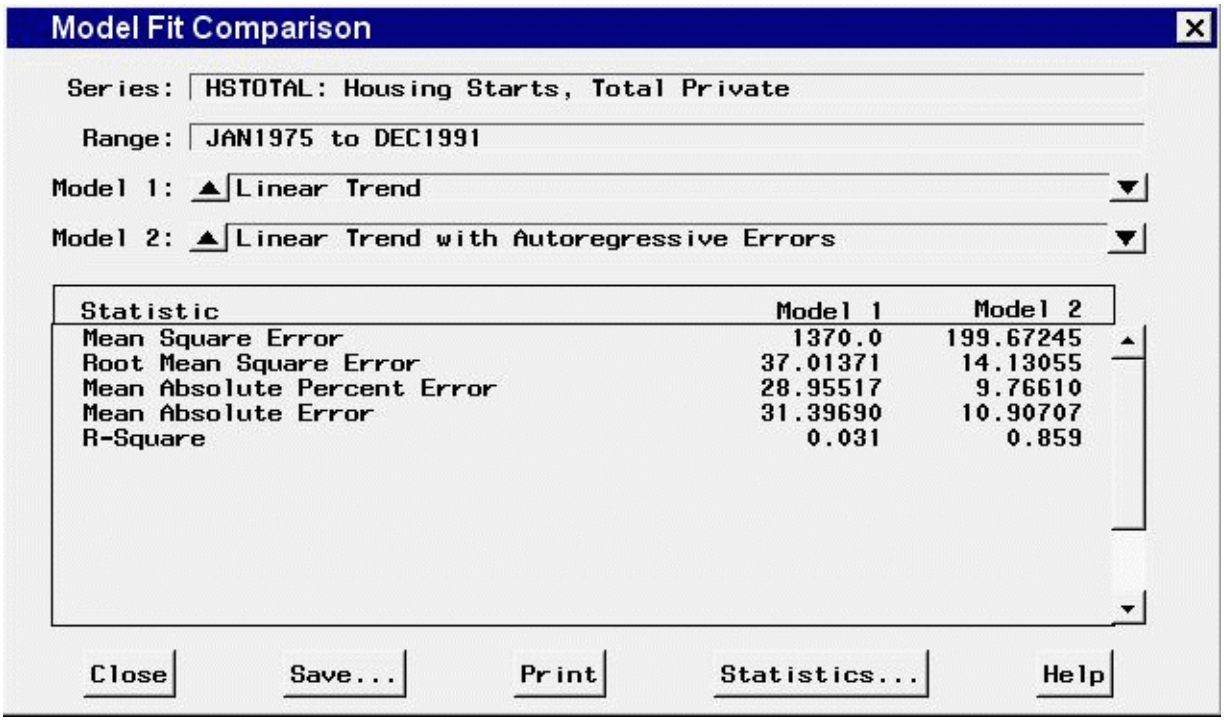
`View Forecasting Model`
: invokes the Model Viewer window to display the forecasting model for the highlighted series. This has the same function as the Model item on the View menu.

`View Forecast`
: opens the Model Viewer window to display the forecasts for the highlighted series. This has the same function as the Forecast item on the View menu.

`Refresh`
: updates information shown in the Manage Forecasting Project window.

Model Fit Comparison Window

Use the Model Fit Comparison window to compare goodness-of-fit statistics for any two models fit to the current series. Access it from the Tools menu of the Develop Models window and the Automatic Model Fitting Results window whenever two or more models have been fit to the series.



Controls and Fields

`Series`
identifies the current time series variable.

`Range`
displays the starting and ending dates of the series data range.

`Model 1`
shows the model currently identified as Model 1.

`Model 1` upward arrow button
enables you to change the model identified as Model 1 if it is not already the first model in the list of models associated with the series. Click this button to cycle upward through the list of models.

`Model 1` downward arrow button
: enables you to change the model identified as Model 1 if it is not already the last model in the list of models. Click this button to cycle downward through the list of models.

`Model 2`
: shows the model currently identified as Model 2.

`Model 2` upward arrow button
: enables you to change the model identified as Model 2 if it is not already the first model in the list of models associated with the series. Click this button to cycle upward through the list of models.

`Model 2` downward arrow button
: enables you to change the model identified as Model 2 if it is not already the last model in the list of models. Click this button to cycle downward through the list of models.

`Close`
: closes the Model Fit Comparison window.

`Save`
: opens a dialog box for specifying the name and label of a SAS data set to which the statistics will be saved. The data set will contain all available statistics and their values for Model 1 and Model 2, as well as a flag variable that is set to 1 for those statistics that were displayed.

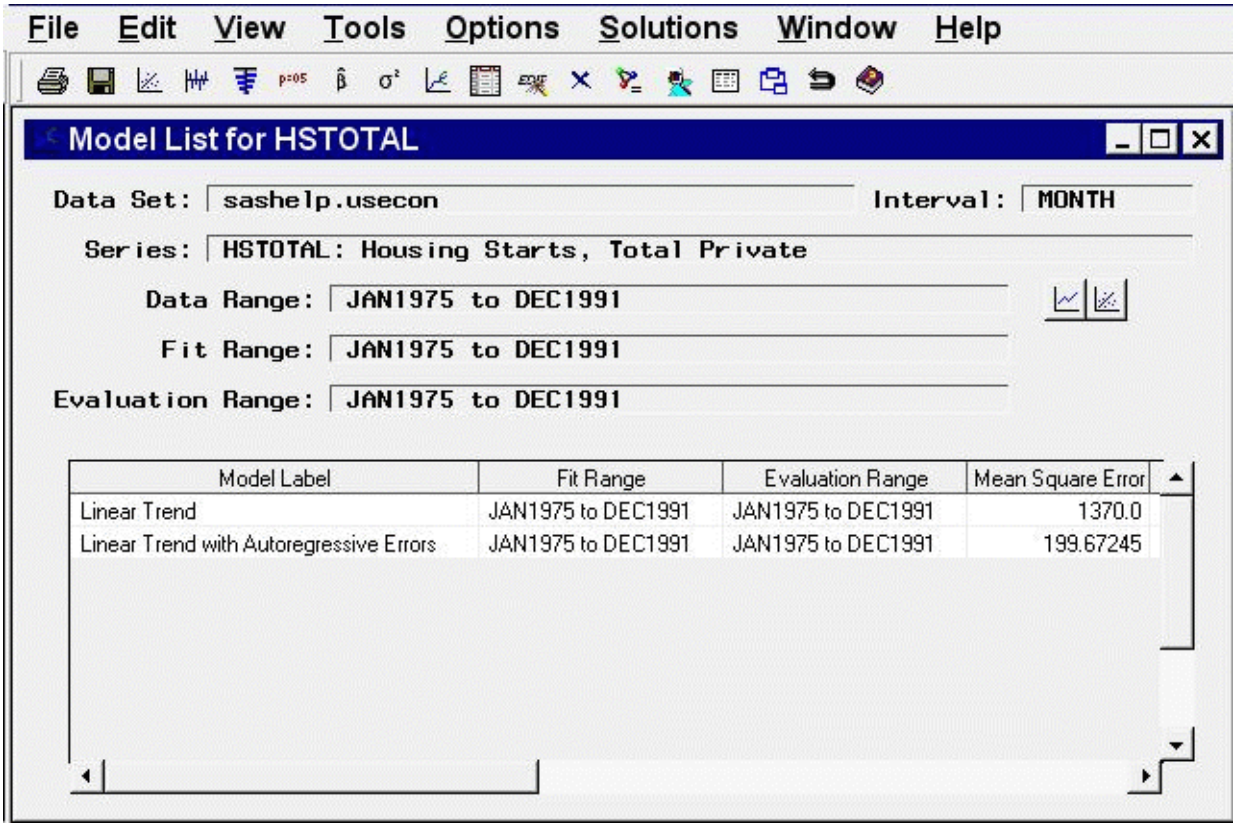
`Print`
: prints the contents of the table to the SAS Output window. If you find that the contents do not appear immediately in the Output window, you need to set scrolling options. Select "Preferences" under the Options submenu of the Tools menu. In the Preferences window, select the Advanced tab, then set output scroll lines to a number greater than zero.

  If you want to route the contents to a printer, go to the Output window and select "Print" from the File menu.

`Statistics`
: opens the Statistics of Fit Selection window for controlling which statistics are displayed.

Model List Window

This resizable window shows all of the models that have been fit to a particular series in a project. Access it from the Manage Forecasting Project window by selecting a series in the series list table and choosing "List Models" from the Tools menu or by double-clicking the series.



Controls and Fields

`Data Set`
: is the name of the current input data set.

`Interval`
: is the time interval (data frequency) for the input data set.

`Series`
: is the variable name and label of the current time series.

`Data Range`
: is the date of the first and last nonmissing data values available for the current series in the input data set.

`Fit Range`
: is the current period of fit setting. This is the range of data that will be used to fit models to the series. It might be different from the fit ranges shown in the table, which were in effect when the models were fit.

`Evaluation Range`
: is the current period of evaluation setting. This is the range of data that will be used to calculate the goodness-of-fit statistics for models fit to the series. It might be different from the evaluation ranges shown in the table, which were in effect when the models were fit.

`View Series Graphically` icon
: opens the Time Series Viewer window to display plots of the current series.

`View Model Graphically` icon
: opens the Model Viewer to display graphs and tables for the currently highlighted model.

Model List Table

The table of models fit to the series contains columns that show the model label, the fit range and evaluation range used to fit the models, and all of the currently selected fit statistics. You can change the selection of fit statistics by using the Statistics of Fit Selection window.

Click on column headings to sort the table by a particular column. If a model is highlighted, clicking with the right mouse button invokes a pop-up menu that provides actions applicable to the highlighted model. It includes the following items.

`View Model`
: opens the Model Viewer on the selected model. This has the same function as "Model Predictions" on the View menu.

`View Parameter Estimates`
: opens the Model Viewer to display the parameter estimates table for the currently highlighted model. This has the same function as "Parameter Estimates" on the View menu.

`View Statistics of Fit`
: opens the Model Viewer to display the statistics of fit table for the currently highlighted model. This has the same function as "Statistics of Fit" on the View menu.

`Edit Model`
: opens the appropriate model specification window for changing the attributes of the highlighted model and fitting the modified model.

`Refit Model`
: refits the highlighted model using the current fit range.

`Reevaluate Model`
: reevaluates the highlighted model using the current evaluation range.

`Delete Model`
: deletes the highlighted model from the project.

`View Forecasts`
: opens the Model Viewer to show the forecasts for the highlighted model. This has the same function as "Forecast Graph" on the View menu.

Menu Bar

`File`

`Save`
: opens a dialog box that lets you save the contents of the table to a specified SAS data set.

`Import Data`
: is available if you license SAS/ACCESS software. It opens an Import Wizard, which you can use to import your data from an external spreadsheet or data base to a SAS data set for use in the Time Series Forecasting System.

`Export Data`
: is available if you license SAS/ACCESS software. It opens an Export Wizard, which you can use to export a SAS data set, such as a forecast data set created with the Time Series Forecasting System, to an external spreadsheet or database.

`Print`
: sends the contents of the table to a printer as defined through Print Setup.

`Print Setup`
: opens the Print Setup window, which allows you to access your operating system print setup.

`Close`
: closes the window and returns to the Manage Forecasting Projects window.

`Edit`

`Edit Model`
: enables you to modify the specification of the currently highlighted model in the table and fit the modified model. The new model replaces the current model in the table.

`Refit Model`
: refits the currently highlighted model using data within the current fit range.

`Reevaluate Model`
: recomputes statistics of fit for the currently highlighted model using data within the current evaluation range.

`Delete Model`
: deletes the currently highlighted model from the model table.

`Reset`
: restores the contents of the Model List window to the state initially displayed.

`View`

`Series`
: opens the Time Series Viewer window to display plots of the current series. This has the same function as the View Series Graphically icon.

`Model Predictions`
: opens the Model Viewer to display a predicted and actual plot for the currently highlighted model. This has the same function as the View Model Graphically icon.

`Prediction Errors`
: opens the Model Viewer to display the prediction errors for the currently highlighted model.

`Prediction Error Autocorrelations`
: opens the Model Viewer to display the prediction error autocorrelations, partial autocorrelations, and inverse autocorrelations for the currently highlighted model.

`Prediction Error Tests`
: opens the Model Viewer to display graphs of white noise and stationarity tests on the prediction errors of the currently highlighted model.

`Parameter Estimates`
: opens the Model Viewer to display the parameter estimates table for the currently highlighted model.

`Statistics of Fit`
: opens the Model Viewer window to display goodness-of-fit statistics for the currently highlighted model.

`Forecast Graph`
: opens the Model Viewer to graph the forecasts for the currently highlighted model.

`Forecast Table`
: opens the Model Viewer to display forecasts for the currently highlighted model in a table.

`Options`

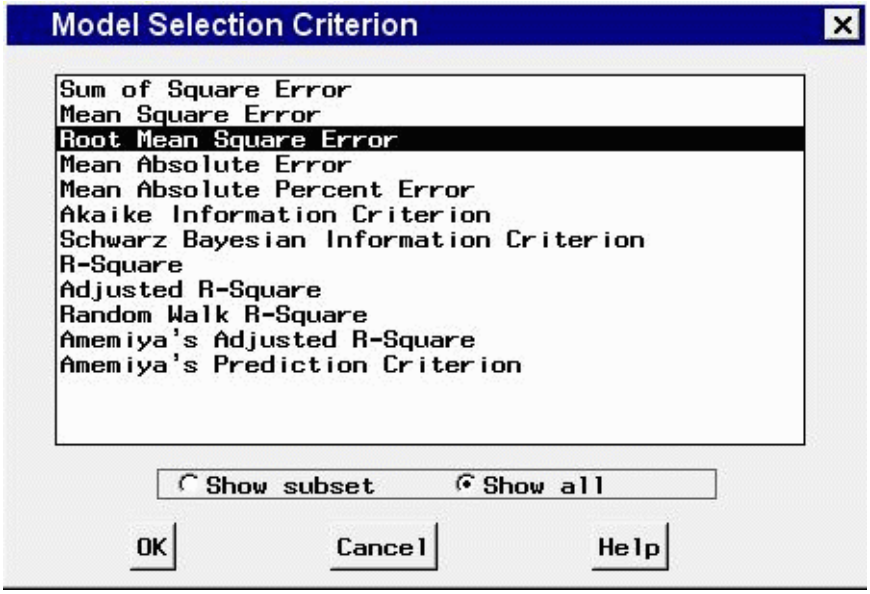
`Statistics of Fit`
: opens the Statistics of Fit Selection window, which presents a list of statistics that the system can display. Use this action to customize the list of statistics shown in the Model Viewer, Automatic Model Fitting Results, and Model Fit Comparison windows and available for selection in the Model Selection Criterion menu.

`Column Labels`
: enables you to set long or short column labels. Long labels are used by default.

Model Selection Criterion Window

Use the Model Selection Criterion window to select the model selection criterion statistic used by the automatic selection process to determine the best fitting forecasting model. Model selection criterion statistics are a subset of those shown in the Statistics of Fit Selection window, since some statistics of fit, such as number of observations, are not useful for model selection.

This window is available from the Model Selection Criterion item of the Options menu of the Develop Models window, Automatic Model Fitting window, and Produce Forecasts window.



Controls and Fields

`Show subset`
: when selected, lists only those model selection criterion statistics that are selected in the Statistics of Fit Selection window.

`Show all`
: when selected, lists all available model selection criterion statistics.

`OK`
: closes the window and sets the model selection criterion to the statistic you specified.

`Cancel`
: closes the window without changing the model selection criterion.

Model Selection List Editor Window

Use the Model Selection List Editor window to edit the model selection list, including adding your own custom models, and to specify which models in the list are to be used in the automatic fitting process. Access it from the Options menu in the Develop Models, Automatic Model Fitting window, Produce Forecasts, and Manage Projects windows.

The window initially displays the current model list for your project. You can modify this set of models in several ways:

- Open one or more alternate model lists to replace or append to the current model list. These can be either model lists included with the software or model lists previously saved by you or other users.

- Turn the autofit option on or off for individual models. Those that are not flagged for autofit will be available by using the Models to Fit window but not by using automatic model fitting.
- Delete models from the list that are not needed for your project.
- Reorder the models in the list.
- Edit models in the list.
- Create a new empty list.
- Add new models to the list.

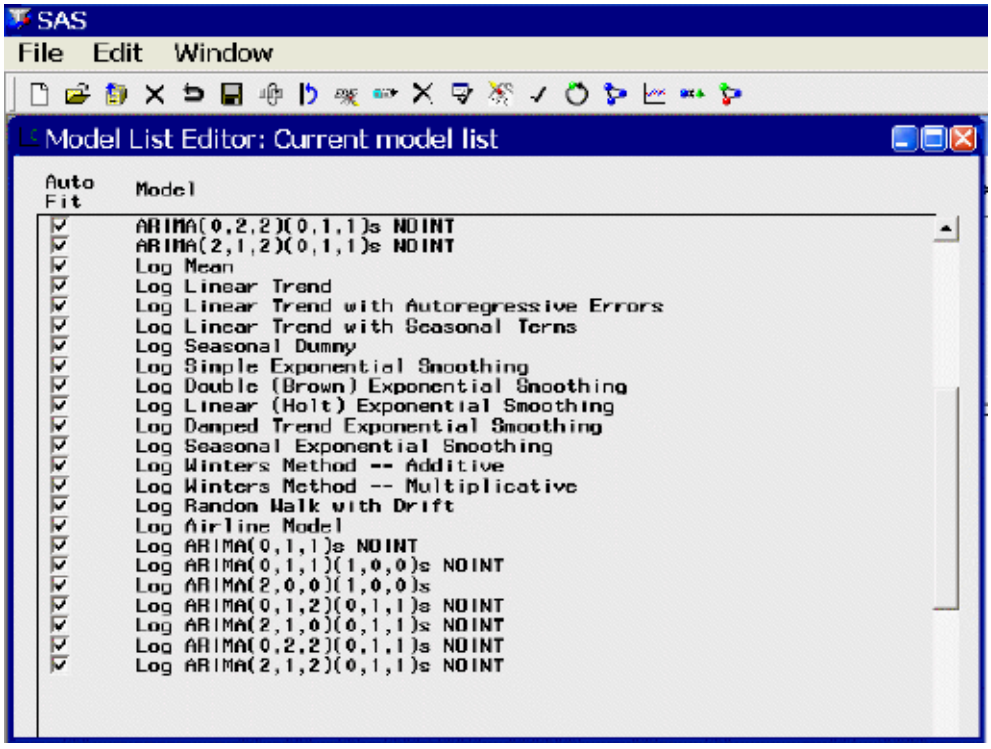
Having modified the current model list, you can save it for future use in several ways:

- Save it in a catalog so it can be opened later in the Model Selection List Editor.
- Save it as the user default to be used automatically when new projects are created.
- Select *close* to close the Model Selection List Editor and attach the modified model selection list to the current project.
- Select *cancel* to close the Model Selection List Editor without changing the current project's model selection list.

Since model selection lists are not bound to specific data sources, care must be taken when including data-specific features such as interventions and regressors. When you add an ARIMA, Factored ARIMA, or Custom model to the list, you can add regressors by selecting from the variables in the current data set. If there is no current data set, you will be prompted to specify a data set so you can select regressors from the series it contains.

If you use a model list that has models with a particular regressor name on a data set that does not contain a series of that name, model fitting will fail. However, you can make global changes to the regressor names in the model list by using *Set regressor names*. For example, you might use the list of dynamic regression models found in the sashelp.forcast catalog. It uses the regressor name "price." If your regressor series is named "x," you can specify "price" as the current regressor name and "x" as the "change to" name. The change will be applied to all models in the list that contain the specified regressor name.

Interventions cannot be defined for models defined from the Model Selection List Editor. However, you can define interventions by using the Intervention Specification Window and apply them to your models by turning on the Include Interventions option.



Auto Fit

The auto fit column of check boxes enables you to eliminate some of the models from being used in the automatic fitting process without having to delete them from the list. By default, all models are checked, meaning that they are all used for automatic fitting.

Model

This column displays the descriptions of all models in the model selection list. You can select one or more models by clicking them. Selected models are highlighted and become the object of the actions Edit, Move, and Delete.

Menu Bar

`File`

`New`
creates a new empty model selection list.

`Open`
opens a dialog box for selecting one or more existing model selection lists to open. If you select multiple lists, they are all opened at once as a concatenated list. This helps you build large specialized model lists quickly by mixing and matching various existing lists such as the various ARIMA model lists included in SASHELP.FORCAST. By default, the lists you open replace the current model list. Select the “append” radio button if you want to append them to the current model list.

`Open System Default`
opens the default model list supplied with the product.

`Cancel`
exits the window without applying any changes to the current project's model selection list.

`Close`
closes the window and applies any changes made to the project's model selection list.

`Save`
opens a dialog box for saving the edited model selection list in a catalog of your choice.

`Save as User Default`
saves your edited model list as a default list for new projects. The location of this saved list is shown on the message line. When you create new projects, the system searches for this model list and uses it if it is found. If it is not found, the system uses the original default model list supplied with the product.

`Edit`

`Reset`
restores the list to its initial state when the window was invoked.

`Add Model`
enables you to add new models to the selection list. You can use the Smoothing Model Specification window, the ARIMA Model Specification window, the Factored ARIMA Model Specification window, or the Custom Model Specification window.

`Edit Selected`
opens the appropriate model specification window for changing the attributes of the highlighted model and adding the modified model to the selection list. The original model is not deleted.

`Move Selected`
enables you to reorder the models in the list. Select one or more models, then select Move Selected from the menu or toolbar. A note appears on the message line: "Select the row after which the selected models are to be moved." Then select any unhighlighted row in the table. The selected models will be moved after this row.

`Delete`
deletes any highlighted models from the list. This item is not available if no models are selected.

`Set Regressor Names`
opens a dialog box for changing all occurrences of a given regressor name in the models of the current model selection list to a name that you specify.

`Select All`
selects all models in the list.

`Clear Selections`
deselects all models in the list.

`Select All for Autofit`
checks the autofit check boxes of all models in the list.

`Clear Autofit Selections`
deselects the autofit check boxes of all models in the list.

Mouse Button Actions

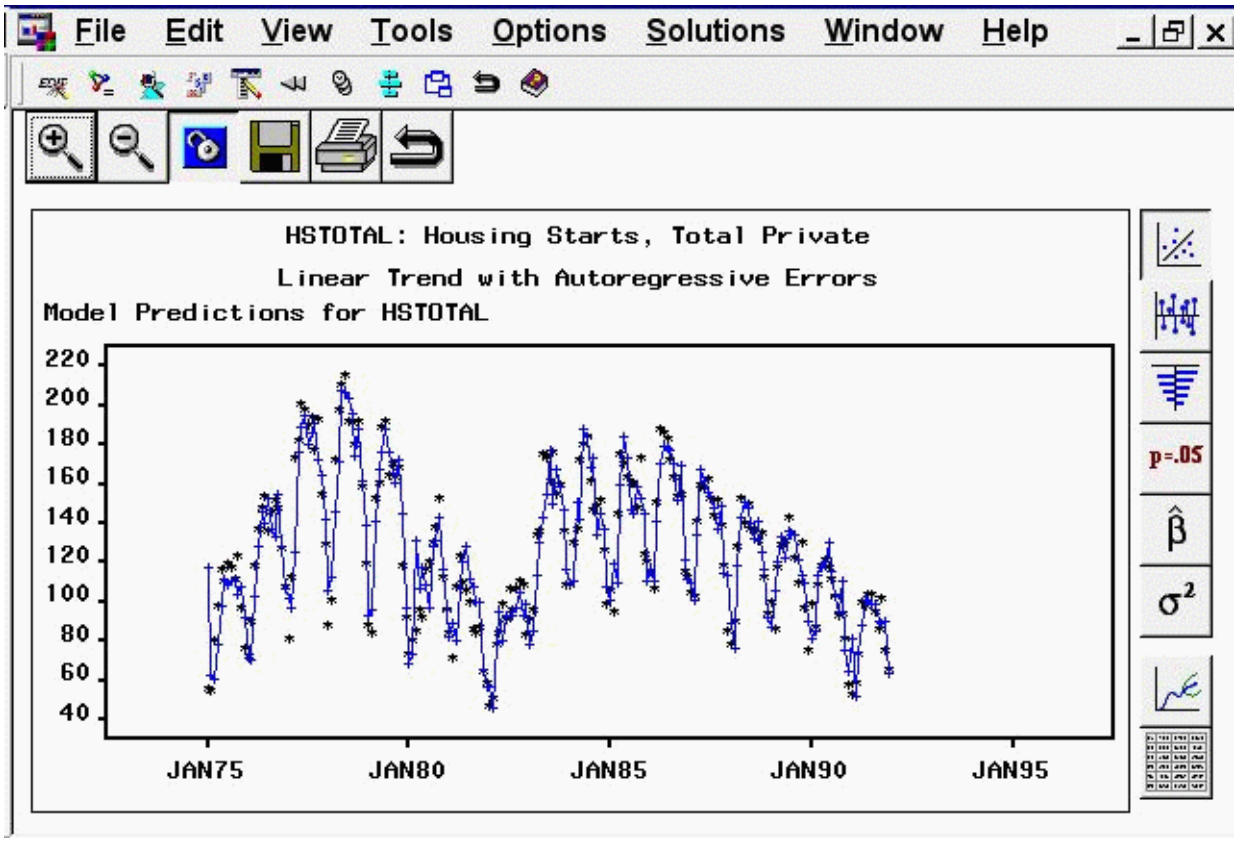
Clicking any model description in the table selects (highlights) that model. Clicking the same model again deselects it. Multiple selections are allowed.

Clicking the auto fit check box in any row toggles the associated model's eligibility for use in automatic model fitting.

Right-clicking the right mouse button opens a pop-up menu.

Model Viewer Window

This resizable window provides plots and tables of actual values, model predictions, forecasts, and related statistics. The various plots and tables available are referred to as *views*. The section "View Selection Icons" on page 3991 explains how to change the view.



You can access Model Viewer in a number of ways, including the View Model Graphically icon of the Develop Models and Model List windows, the Graph button of the Automatic Model Fitting Results window, and the Model item under the View menu in the Manage Forecasting Project window. In addition, you can go directly to a selected view in the Model Viewer window by selecting Model Predictions, Prediction Errors, Statistics of Fit, Prediction Error Autocorrelations, Prediction Error Tests, Parameter Estimates, Forecast Graph, or Forecast Table from the View menu or corresponding toolbar icon or pop-up menu item in the Develop Models, Model List, or Automatic Model Fitting Results windows.

The state of the Model Viewer window is controlled by the current model and the currently selected view. You can resize this window, and you can use other windows without closing the Model Viewer window. By default, the Model Viewer window is automatically updated to display the new model when you switch to working with another model (that is, when you highlight a different model). You can unlink the Model Viewer window from the current model selection by selecting the Link/Unlink icon from the window's horizontal toolbar. See "Link/Unlink" in the section "Toolbar Icons" on page 3991.

For more information, see the section "Model Viewer" on page 3806.

Toolbar Icons

The Model Viewer window contains a horizontal row of icons called the Toolbar. Corresponding menu items appear under various menus. The function of each icon is explained in the following list.

`Zoom in`
: In the Model Predictions, Prediction Errors, and Forecast Graph views, the Zoom In action changes the mouse pointer into cross hairs that you can use with the left mouse button to define a region of the graph to zoom in on. In the Prediction Error Autocorrelations and Prediction Error Tests views, Zoom In reduces the number of lags displayed.

`Zoom out`
: reverses the previous Zoom In action.

`Link/Unlink viewer`
: disconnects or connects the Model Viewer window to the model table (Develop Models window, Model List window, or Automatic Model Fitting Results window). When the viewer is linked, selecting another model in the model table causes the model viewer to be updated to show the selected model. When the Viewer is unlinked, selecting another model does not affect the viewer. This feature is useful for comparing two or more models graphically. You can display a model of interest in the Model Viewer, unlink it, then select another model and open another Model Viewer window for that model. Position the viewer windows side by side for convenient comparisons of models, or use the Next Viewer icon or F12 function key to switch between them.

`Save`
: saves the contents of the Model Viewer window. By default, an HTML page is created. This enables you to display graphs and tables by using the Results Viewer or publish them on the web or your intranet. See also "Save Graph As" and "Save Data As" under "Menu Bar" below.

`Print`
: prints the contents of the viewer window.

`Close`
: closes the Model Viewer window and returns to the window from which it was invoked.

View Selection Icons

At the right hand side of the Model Viewer window is a vertical toolbar to select the view—that is, the kind of plot or table that the viewer displays. Corresponding menu items appear under View on the menu bar. The function of each icon is explained in the following list.

`Model Predictions`
: displays a plot of actual series values and model predictions over time. Click individual points in the graph to get a display of the type (actual or predicted), ID value, and data value in the upper right corner of the window.

`Prediction Errors`
: displays a plot of model prediction errors (residuals) over time. Click individual points in the graph to get a display of the prediction error value in the upper right corner of the window.

`Prediction Error Autocorrelations`
: displays horizontal bar charts of the sample autocorrelation, partial autocorrelation, and inverse autocorrelation functions for the model prediction errors. Overlaid line plots represent confidence limits computed at plus and minus two standard errors. Click any of the bars to display its value.

`Prediction Error Tests`
: displays horizontal bar charts that represent results of white noise and stationarity tests on the model prediction errors. The first bar chart shows the significance probability of the Ljung-Box chi-square statistic computed on autocorrelations up to the given lag. Longer bars favor rejection of the null hypothesis that the series is white noise. Click any of the bars to display an interpretation.

  The second bar chart shows tests of stationarity of the model prediction errors, where longer bars favor the conclusion that the series is stationary. Each bar displays the significance probability of the augmented Dickey-Fuller unit root test to the given autoregressive lag. Long bars represent higher levels of significance against the null hypothesis that the series contains a unit root. For seasonal data, a third bar chart appears for seasonal root tests. Click on any of the bars to display an interpretation.

`Parameter Estimates`
: displays a table showing model parameter estimates along with standard errors and *t* tests for the null hypothesis that the parameter is zero.

`Statistics of Fit`
: displays a table of statistics of fit for the selected model. The set of statistics shown can be changed by using the Statistics of Fit item under Options on the menu bar.

`Forecast Graph`
: displays a plot of actual and predicted values for the series data range, followed by a horizontal reference line and forecasted values with confidence limits. Click individual points in the graph to get a display of the type, date/time, and value of the data point in the upper right corner of the window.

`Forecast Table`
: displays a data table with columns containing the date/time, actual, predicted, error (residual), lower confidence limit, and upper confidence limit values, together with any predictor series.

Menu Bar

`File`

`Save Graph`
: saves the plot displayed in viewer window as a SAS/GRAPH grseg catalog entry. When the current view is a table, this menu item is not available. See also "Save" in the section "Toolbar Icons" on page 3991. If a graphics catalog entry name has not already been specified, this action functions like "Save Graph As."

`Save Graph As`
saves the current graph as a SAS/GRAPH grseg catalog entry in a SAS catalog that you specify and/or as an Output Delivery System (ODS) object. By default, an HTML page is created, with the graph embedded as a gif image.

`Save Data`
saves the data displayed in the viewer window in a SAS data set, where applicable.

`Save Data As`
saves the data in a SAS data set that you specify and/or as an Output Delivery System (ODS) object. By default, an HTML page is created, with the data displayed as a table.

`Import Data`
is available if you license SAS/ACCESS software. It opens an Import Wizard, which you can use to import your data from an external spreadsheet or data base to a SAS data set for use in the Time Series Forecasting System.

`Export Data`
is available if you license SAS/ACCESS software. It opens an Export Wizard, which you can use to export a SAS data set, such as a forecast data set created with the Time Series Forecasting System, to an external spreadsheet or database.

`Print Graph`
prints the contents of the viewer window if the current view is a graph. This has the same function as the Print toolbar icon. If the current view is a table, this menu item is not available.

`Print Data`
prints the data displayed in the viewer window, where applicable.

`Print Setup`
opens the Print Setup window, which allows you to access your operating system print setup.

`Print Preview`
opens a preview window to show how your plots will appear when printed.

`Close`
closes the Model Viewer window and returns to the window from which it was invoked.

`Edit`

`Edit Model`
enables you to modify the specification of the current model and to fit the modified model, which is then displayed in the viewer.

`Refit Model`
refits the current model by using data within the current fit range. This action also causes the ranges to be reset if the data range has changed.

`Reevaluate Model`
reevaluates the current model by using data within the current evaluation range. This action also causes the ranges to be reset if the data range has changed.

`View`
See "View Selection Icons" on page 3991. It describes each of the items available under "View," except "Zoom Way Out."

Zoom Way Out
: zooms the plot out as far as it will go, undoing all prior zoom in operations.

Tools

Link Viewer
: See “Link/Unlink” in the section “Toolbar Icons” on page 3991.

Options

Time Ranges
: opens the Time Ranges Specification window to enable you to change the period of fit, period of evaluation, or forecast horizon to be applied to subsequently fit models.

Statistics of Fit
: opens the Statistics of Fit Selection window, which presents a list of statistics that the system can display. Use this action to customize the list of statistics shown in the statistics of fit table and available for selection in the Model Selection Criterion menu.

Forecast Options
: opens the Forecast Options window, which enables you to control the widths of forecast confidence limits and control the kind of predicted values computed for models that include series transformations.

Residual Plot Options
: provides a choice of four methods of computing prediction errors for models which include a data transformation.

  Prediction Errors
  : computes the difference between the transformed series actual values and model predictions.

  Normalized Prediction Errors
  : computes prediction errors in normalized form.

  Model Residuals
  : computes the difference between the untransformed series values and the untransformed model predictions.

  Normalized Model Residuals
  : computes model residuals in normalized form.

Number of Lags
: opens a window to enable you to specify the number of lags shown in the Prediction Error Autocorrelations and Prediction Error Tests views. You can also use the Zoom In and Zoom Out actions to control the number of lags displayed.

Correlation Probabilities
: controls whether the bar charts in the Prediction Error Autocorrelations view represent significance probabilities or values of the correlation coefficient. A check mark or filled check box next to this item indicates that significance probabilities are displayed. In each case the bar graph horizontal axis label changes accordingly.

`Include Interventions`
: controls whether intervention effects defined for the current series are automatically added as predictors to the models considered by the automatic selection process. A check mark or filled check box next to this item indicates that the option is turned on.

`Print Audit Trail`
: prints to the SAS log information about the models fit by the system. A check mark or filled check box next to this item indicates that the audit option is turned on.

`Show Source Statements`
: controls whether SAS statements submitted by the forecasting system are printed in the SAS log. When the Show Source Statements option is selected, the system sets the SAS system option SOURCE before submitting SAS statements; otherwise, the system uses the NOSOURCE option. Note that only some of the functions performed by the forecasting system are accomplished by submitting SAS statements. A check mark or filled check box next to this item indicates that the option is turned on.

Mouse Button Actions

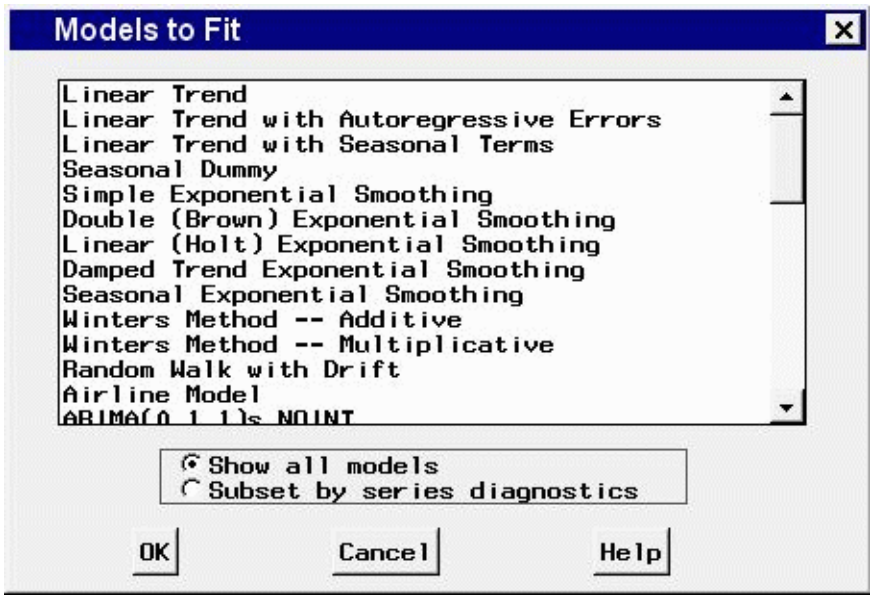
You can examine the data values of individual points in the Model Predictions, Model Prediction Errors, and Forecast Graph views of the Model Viewer by clicking the point. The date/time and data values as well as the type (actual, predicted, and so forth) are displayed in a box that appears in the upper right corner of the Viewer window. Click the mouse elsewhere or select any action to dismiss the data box.

Similarly, you can display values in the Prediction Error Autocorrelations view by clicking any of the bars. Clicking bars in the Prediction Error Tests view displays a Recommendation for Current View window which explains the test represented by the bar.

When you select the Zoom In action in the Predicted Values, Model Prediction Errors, and Forecasted Values views, you can use the mouse to define a region of the graph to zoom. Position the mouse pointer at one corner of the region, press the left mouse button, and move the mouse pointer to the opposite corner of the region while holding the left mouse button down. When you release the mouse button, the plot is redrawn to show an expanded view of the data within the region you selected.

Models to Fit Window

Use the Models to Fit window to fit models by choosing them from the current model selection list. Access it by using “Fit Models from List” on the Fit Model submenu of the Edit menu in the Develop Models window, or the pop-up menu that appears when you click an empty area of the model table in the Develop Models window. If you want to alter the list of models that appears here, use the Model Selection List editor window.



To select a model to be fit, use the left mouse button. To select more than one model to fit, drag with the mouse, or select the first model, then press the shift key while selecting the last model. For noncontiguous selections, press the control key while selecting with the mouse. To begin fitting the models, double-click the last selection or select the OK button.

If series diagnostics have been performed, the radio box is available. If the Subset by series diagnostics radio button is selected, only those models in the selection list that fit the diagnostic criteria will be shown for selection. If you want to choose models that do not fit the diagnostic criteria, click the Show all models button.

Controls and Fields

`Show all models`
: when selected, lists all available models, regardless of the setting of the series diagnostics options.

`Subset by series diagnostics`
: when selected, lists only the available models that are consistent with the series diagnostics options.

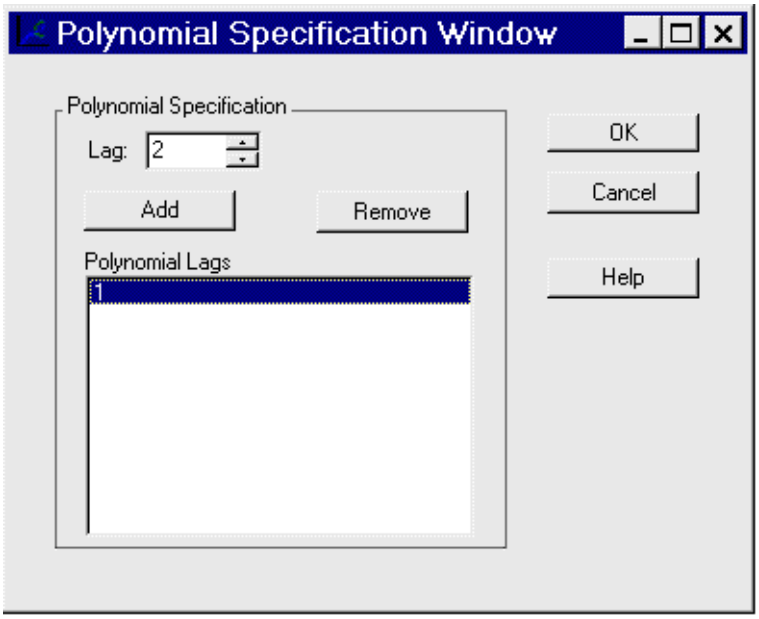
`OK`
: closes the Models to Fit window and fits the selected models.

`Cancel`
: closes the window without fitting any models. Any selections you made are lost.

Polynomial Specification Window

Use the Polynomial Specification window to add a polynomial to an ARIMA model. The set of lags defined here become a polynomial factor, denoted by a list of lags in parentheses, when you click “OK.” If you accessed this window from the AR Polynomial Specification window, then it is added to the autoregressive

part of the model. If you accessed it from the MA Polynomial Specification window, it is added to the moving-average part of the model.



Controls and Fields

`Lag`
: specifies a lag value to add to the list. Type in a positive integer or select one by clicking the spin box arrows.

`Add`
: adds the value in the Lag spin box to the list of polynomial lags. Duplicate values are not allowed.

`Remove`
: deletes a selected lag from the list of polynomial lags.

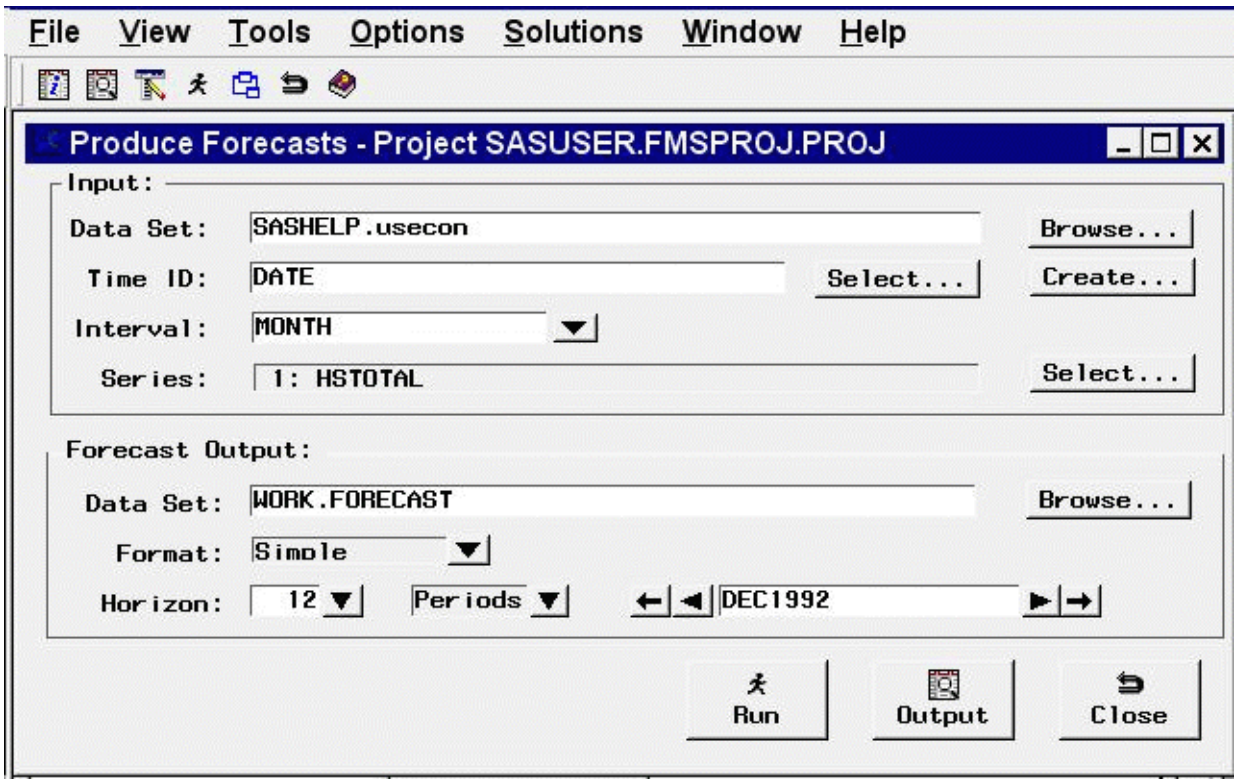
`Polynomial Lags`
: is a list of unique integers that represent lags to be added to the model.

`OK`
: closes the window and returns the specified polynomial to the AR or MA polynomial specification window.

`Cancel`
: closes the window and discards any polynomial lags added to the list.

Produce Forecasts Window

Use the Produce Forecasts window to produce forecasts for the series in the current input data set for which you have fit forecasting models. Access it by using the Produce Forecasts button of the Time Series Forecasting window.



Controls and Fields

Input `Data Set`
: is the name of the current input data set. To specify the input data set, you can type a one-level or two-level SAS data set name in this field or click the Browse button to the right of the field.

Input data set `Browse` button
: opens the Data Set Selection window to enable you to select the input data set.

`Time ID`
: is the name of the time ID variable for the input data set. To specify this variable, you can type the ID variable name in this field or use the Select button.

Time ID `Select` button
: opens the Time ID Variable Specification window.

`Create` button
: opens a menu of choices of methods for creating a time ID variable for the input data set. Use this feature if the input data set does not already contain a valid time ID variable.

`Interval`
: is the time interval between observations (data frequency) in the current input data set. If the interval is not automatically filled in by the system, you can type in an interval name here, or select one from the pop-up list.

`Series`
: indicates the number and names of time series variables for which forecasts will be produced.

Series `Select` button
: opens the Series to Process window to let you select the series for which you want to produce forecasts.

Forecast Output `Data Set`
: is the name of the output data set that will contain the forecasts. Type the name of the output data set in this field or click the Browse button.

Forecast Output `Browse` button
: opens a dialog box to let you locate an existing data set to which to save the forecasts.

`Format`
: enables you to select one of three formats for the forecast data set:

  `Simple`
  : specifies the simple format for the output data set. The data set contains the time ID variable and the forecast variables and contains one observation per time period. Observations for earlier time periods contain actual values copied from the input data set; later observations contain the forecasts.

  `Interleaved`
  : specifies the interleaved format for the output data set. The data set contains the time ID variable, the variable TYPE, and the forecast variables. There are several observations per time period, with the meaning of each observation identified by the TYPE variable.

  `Concatenated`
  : specifies the concatenated format for the output data set. The data set contains the variable SERIES, the time ID variable, and the variables ACTUAL, PREDICT, ERROR, LOWER, and UPPER. There is one observation per time period per forecast series. The variable SERIES contains the name of the forecast series, and the data set is sorted by SERIES and DATE.

`Horizon`
: is the number of periods or years to forecast beyond the end of the input data range. To specify the forecast horizon, you can type a value in this field or select one from the pop-up list.

`Horizon periods`
: selects the units to apply to the horizon. By default, the horizon value represents number of periods. For example, if the interval is month, the horizon represents the number of months to forecast. Depending on the interval, you can also select weeks or years, so that the horizon is measured in those units.

`Horizon date`
: is the ending date of the forecast horizon. You can type in a date that uses a form recognized by a SAS date informat, or you can increment or decrement the date shown by using the left and right arrows. The outer arrows change the date by a larger amount than the inner arrows. The date field and the horizon field reset each other, so you can use either one to specify the forecasting horizon.

`Run` button
: produces forecasts for the selected series and stores the forecasts in the specified output SAS data set.

`Output` button
: opens a Viewtable window to display the output data set. This button becomes available once the forecasts have been written to the data set.

`Close` button
: closes the Produce Forecasts window and returns to the Time Series Forecasting window.

Menu Bar

File

Import Data
: is available if you license SAS/ACCESS software. It opens an Import Wizard, which you can use to import your data from an external spreadsheet or database to a SAS data set for use in the Time Series Forecasting System.

Export Data
: is available if you license SAS/ACCESS software. It opens an Export Wizard, which you can use to export a SAS data set, such as a forecast data set created with the Time Series Forecasting System, to an external spreadsheet or database.

Print Setup
: opens the Print Setup window, which allows you to access your operating system print setup.

Close
: closes the Produce Forecasts window and returns to the Time Series Forecasting window.

View

Input Data Set
: opens a Viewtable window to browse the current input data set.

Output Data Set
: opens a Viewtable window to browse the output data set. This has the same function as the Output button.

Tools

Produce Forecasts
: produces forecasts for the selected series and stores the forecasts in the specified output SAS data set. This has the same function as the Run button.

Options

Default Time Ranges
: opens the Default Time Ranges window to enable you to control how the system sets the time ranges when new series are selected.

Model Selection List
: opens the Model Selection List editor window. Use this to edit the set of forecasting models considered by the automatic model selection process and displayed by the Models to Fit window.

Model Selection Criterion
: opens the Model Selection Criterion window, which presents a list of goodness-of-fit statistics and enables you to select the fit statistic that is displayed in the table and used by the automatic model selection process to determine the best fitting model.

`Statistics of Fit`
: opens the Statistics of Fit Selection window, which presents a list of statistics that the system can display. Use this action to customize the list of statistics shown in the Statistics of Fit table and available for selection in the Model Selection Criterion window.

`Forecast Options`
: opens the Forecast Options window, which enables you to control the widths of forecast confidence limits and control the kind of predicted values computed for models that include series transformations.

`Forecast Data Set`
: enables you to select one of three formats for the forecast data set. See `Format`, which is described previously in this section.

`Alignment of Dates`

`Beginning`
: aligns dates that the system generates to identify forecast observations in output data sets to the beginning of the time intervals.

`Middle`
: aligns dates that the system generates to identify forecast observations in output data sets to the midpoints of the time intervals.

`End`
: aligns dates that the system generates to identify forecast observations in output data sets to the end of the time intervals.

`Automatic Fit`
: opens the Automatic Model Selection Options window, which enables you to control the number of models retained by the automatic model selection process and whether the models considered for automatic selection are subset according to the series diagnostics.

`Set Toolbar Type`

`Image Only`
: displays the toolbar items as icons without text.

`Label Only`
: displays the toolbar items as text without icon images.

`Both`
: displays the toolbar items as both text and icon images.

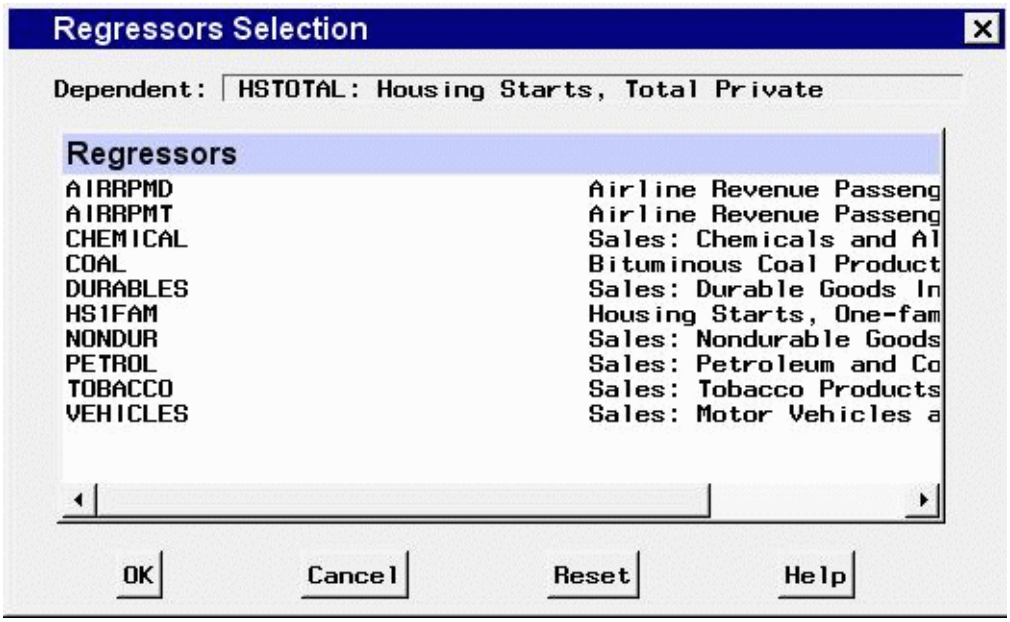
`Include Interventions`
: controls whether intervention effects defined for the current series are automatically added as predictors to the models considered by the automatic selection process. A check mark or filled check box next to this item indicates that the option is turned on.

`Print Audit Trail`
: prints to the SAS log information about the models fit by the system. A check mark or filled check box next to this item indicates that the audit option is turned on.

`Show Source Statements`
: controls whether SAS statements submitted by the forecasting system are printed in the SAS log. When the Show Source Statements option is selected, the system sets the SAS system option SOURCE before submitting SAS statements; otherwise, the system uses the NOSOURCE option. Note that only some of the functions performed by the forecasting system are accomplished by submitting SAS statements. A check mark or filled check box next to this item indicates that the option is turned on.

Regressors Selection Window

Use the Regressors Selection window to select one or more time series variables in the input data set to include as regressors in the forecasting model to predict the dependent series. Access it from the pop-up menu that appears when you click the Add button in the ARIMA Model Specification window or Custom Model Specification window.



Controls and Fields

`Dependent`
: is the name and variable label of the current series.

`Regressors`
: is a table listing the names and labels of the variables in the input data set available for selection as regressors. The variables that you select are highlighted. Selecting a highlighted row again deselects that variable.

`OK`
: closes the Regressors Selection window and adds the selected variables as regressors in the model.

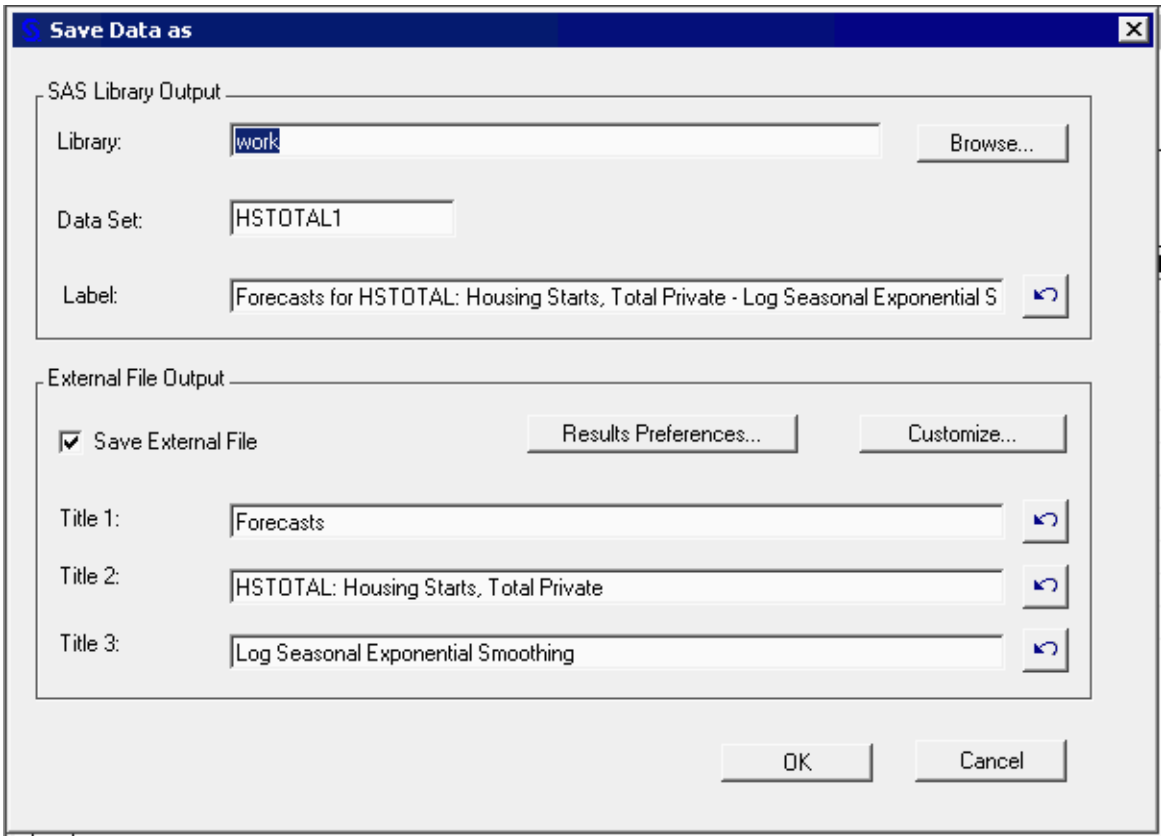
`Cancel`
: closes the window without adding any regressors. Any selections you made are lost.

`Reset`
: resets all options to their initial values upon entry to the window.

Save Data As

Use Save Data As from the Time Series Viewer Window or the Model Viewer Window to save data displayed in a table to a SAS data set or external file.

Use Save Forecast As from the Develop Models Window to save forecasts and related data including the series name, model, and interval. It supports append mode, enabling you to accumulate the forecasts of multiple series in a single data set.



To save your data in a SAS data set, provide a library name or assign one by using the Browse button, then provide a data set name or accept the default. Enter a descriptive label for the data set in the Label field. Click OK to save the data set. If you specify an existing data set, it will be overwritten, except in the case of Save Forecast As.

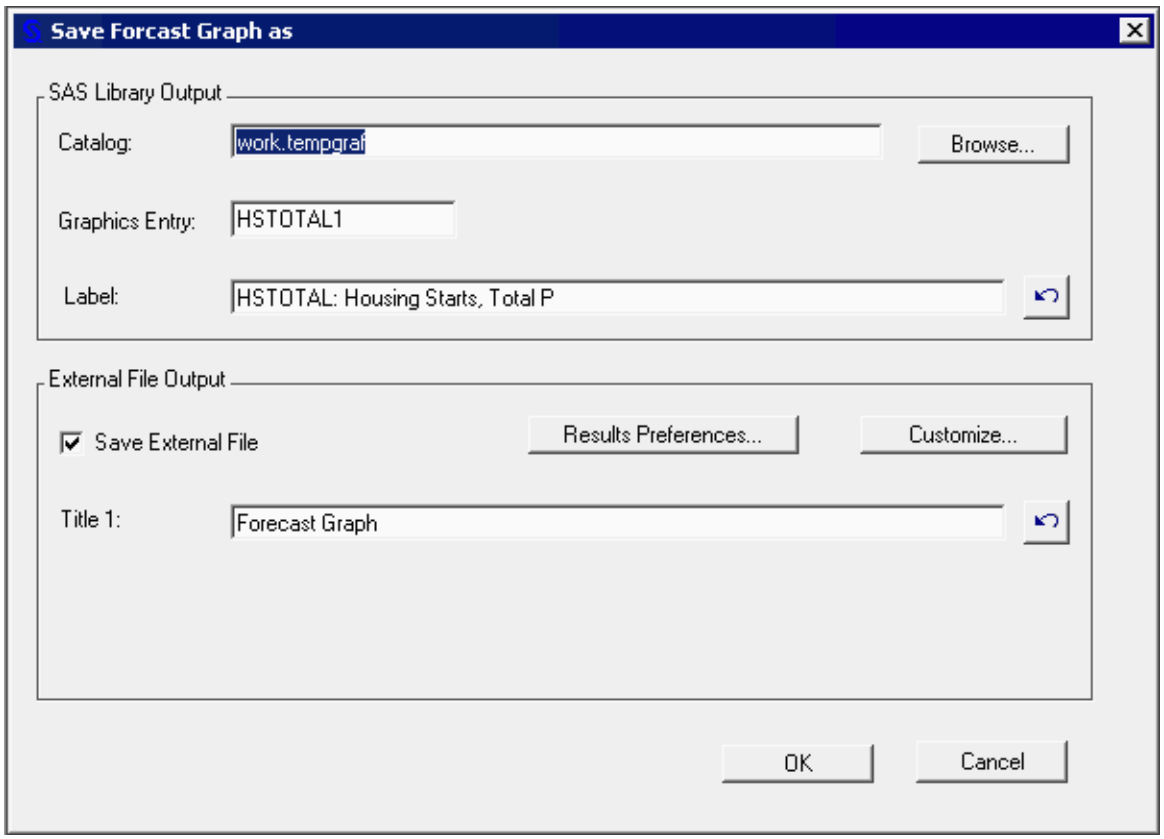
External file output takes advantage of the Output Delivery System (ODS) and is designed primarily for creating HTML tables for web reporting. You can build a set of web pages quickly and use the ODS Results window to view and organize them. To use this feature, check Save External File in the External File Output box. To set ODS options, click Results Preferences, and then select the Results tab in the Preferences dialog box.

If you have previously saved data of the current type, the system remembers your previous labels and titles. To reuse them, click the arrow button to the right of each of these window fields.

Use the Customize button if you need to specify the name of a custom macro that contains ODS statements. The default macro simply runs the PRINT procedure. A custom macro can be used to add PRINT procedure and/or ODS statements to customize the type and organization of output files produced.

Save Graph As

Use Save Graph As from the Time Series Viewer Window or the Model Viewer Window to save any of the graphs in a catalog or external file.



To save your graph as a grseg catalog entry, enter a two level name for the catalog or select Browse to open an Open dialog box. Use it to select an existing library or assign a new one and then select a catalog to contain the graph. Click the Open button to open the catalog and close the dialog box. Then enter a graphics entry name (eight characters or less) and a label or accept the defaults and click the OK button to save the graph.

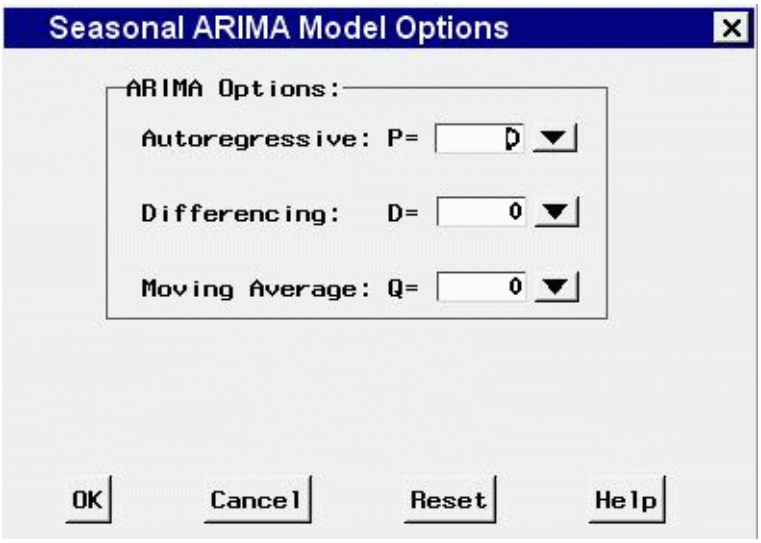
External file output takes advantage of the Output Delivery System (ODS) and is designed primarily for creating gif images and HTML for web reporting. You can build a set of web pages that contain graphs and use the Results window to view and organize them. To use this feature, check Save External File in the External File Output box. To set ODS options, click Results Preferences, and then select the Results tab in the Preferences dialog box.

If you have previously saved graphs of the current type, the system remembers your previous labels and titles. To reuse them, click the arrow button to the right of each of these window fields.

Use the Customize button if you need to specify the name of a custom macro that contains ODS statements. The default macro simply runs the GREPLAY procedure. Users familiar with ODS might want to add statements to the macro to customize the type and organization of output files produced.

Seasonal ARIMA Model Options Window

Use the Seasonal ARIMA Model Options window to specify the autoregressive, differencing, and moving-average orders for the seasonal part of a model defined by using the Custom Model Specification window. Access it by selecting "Seasonal ARIMA. . . " from the Seasonal Model combo box of that window.



Controls and Fields

`ARIMA Options`

Use these combo boxes to specify the orders of the ARIMA model. You can either type in a value or click the combo box arrow to select from a pop-up list.

`Autoregressive`

defines the order of the seasonal autoregressive part of the model.

`Differencing`

defines the order of seasonal differencing.

`Moving Average`

defines the order of the seasonal moving-average term.

`OK`

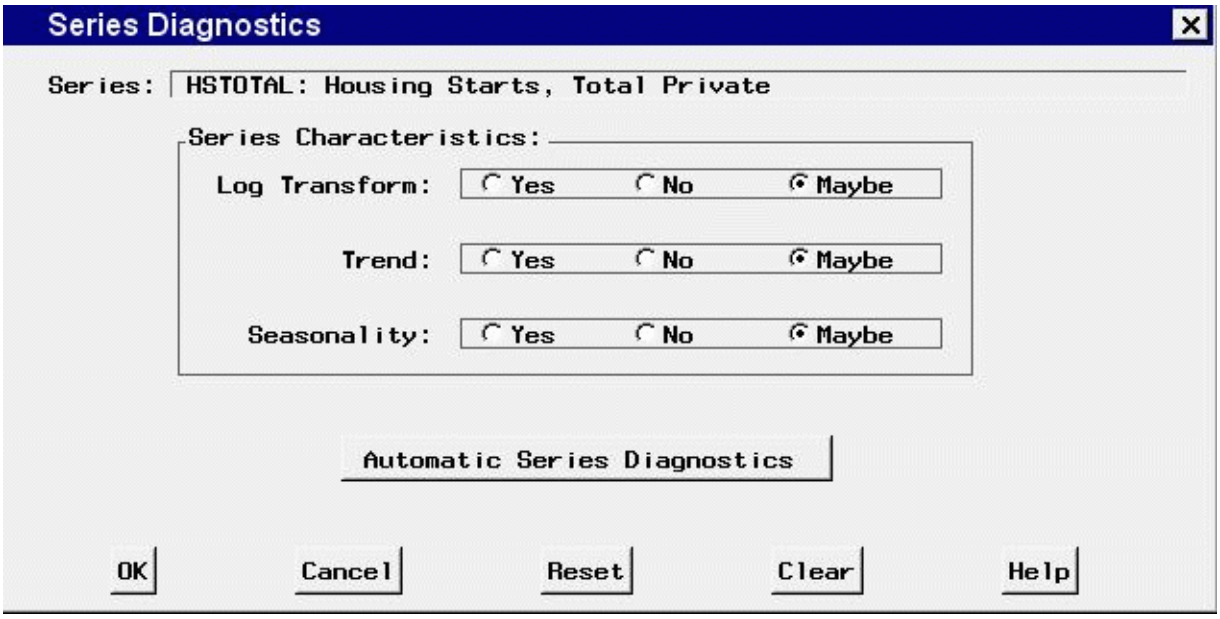
closes the Seasonal ARIMA Model Options window and returns to the Custom Model Specification window.

`Cancel`
: closes the Seasonal ARIMA Model Options window and returns to the Custom Model Specification window, discarding any changes made.

`Reset`
: resets all options to their initial values upon entry to the window.

Series Diagnostics Window

Use the Series Diagnostics window to set options to limit the kinds of forecasting models considered for the series according to series characteristics. Access it by selecting "Diagnose Series" from the Tools menu in the Develop Models, Manage Project, and Time Series Viewer window menu bars. You can let the system diagnose the series characteristics automatically or you can specify series characteristics according to your judgment by using the radio buttons.



For each of the options Log Transform, Trend, and Seasonality, the value "Yes" means that only models appropriate for series with that characteristic should be considered. The value "No" means that only models appropriate for series without that characteristic should be considered. The value "Maybe" means that models should be considered without regard for that characteristic.

Controls and Fields

`Series`
is the name and variable label of the current series.

`Series Characteristics`

`Log Transform`
specifies whether forecasting models with or without a logarithmic series transformation are appropriate for the series.

`Trend`
specifies whether forecasting models with or without a trend component are appropriate for the series.

`Seasonality`
specifies whether forecasting models with or without a seasonal component are appropriate for the series.

`Automatic Series Diagnostics`
performs the automatic series diagnostic process. The options Log Transform, Trend, and Seasonality are set according to the results of statistical tests.

`OK`
closes the Series Diagnostics window.

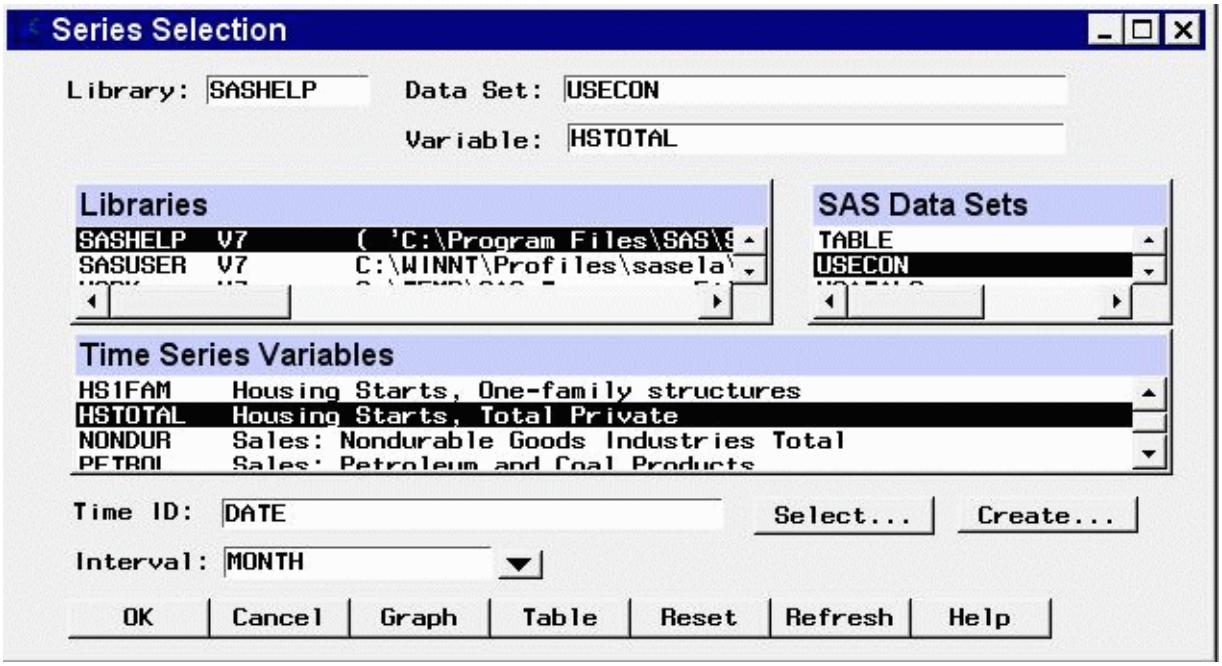
`Cancel`
closes the Series Diagnostics window without changing the series diagnostics options. Any options you specified are lost.

`Reset`
resets all options to their initial values upon entry to the Series Diagnostics window.

`Clear`
resets all options to their default values.

Series Selection Window

Use this resizable window to select a time series variable by specifying a library, a SAS data set or view, and a variable. These selections can be made by typing, by selecting from lists, or by a combination of the two. In addition, you can control the time ID variable and time interval, and you can browse the data set or view plots of the series from this window.



This window appears automatically when you click the View Series Graphically or Develop Models button in the Time Series Forecasting window and no series has been selected, and when you open the Time Series Viewer as a stand-alone tool. It is also invoked by using the Browse button in the Develop Models window.

The system requires that series names be unique for each frequency (interval) within the forecasting project. If you select a series from the current input data set that already exists in the project with the same interval but a different input data set name, the system warns you and gives you the option to cancel the selection, to refit all models associated with the series by using the data from the current input data set, to delete the models for the series, or to inherit the existing models.

Controls and Fields

`Library`
: is a SAS libname assigned within the current SAS session. If you know the libname associated with the data set of interest, you can type it in this field and press Return. If it is a valid choice, it will appear in the libraries list and will be highlighted. The SAS Data Sets list will be populated with data sets associated with that libname.

`Data Set`
: is the name of a SAS data set (data file or data view) that resides under the selected libname. If you know the name, you can type it in and press Return. If it is a valid choice, it will appear in the SAS Data Sets list and will be highlighted, and the Time Series Variables list will be populated with the numeric variables in the data set.

`Variable`
: is the name of a numeric variable contained in the selected data set. You can type the variable name in this field or you can select the variable with the mouse from the Time Series Variables list.

`Time ID`
: is the name of the ID variable for the input data set. To specify the ID variable, you can type the ID variable name in this field or click the Select button.

`Select` button
: opens the Time ID Variable Specification window to let you select an existing variable in the data set as the Time ID.

`Create` button
: opens a menu of methods for creating a time ID variable for the input data set. Use this feature if the data set does not already contain a valid time ID variable.

`Interval`
: is the time interval between observations (data frequency) in the selected data set. If the interval is not automatically filled in by the system, you can type in an interval name or select one from the pop-up list. For more information about intervals, see Chapter 4, "Date Intervals, Formats, and Functions," in this book.

`OK`
: is a button that is present when you have selected "Develop Models" from the Time Series Forecasting window. It closes the Series Selection window and makes the selected series the current series.

`Close`
: If you have selected the View Series Graphically icon from the Time Series Forecasting window, this button returns you to that window. If you have selected a series, it remains selected as the current series.

  If you are using the Time Series Viewer as a stand-alone application, this button closes the application.

`Cancel`
: is a button that is present when you have selected "Develop Models" from the Time Series Forecasting window. It closes the Series Selection window without applying any selections made.

`Reset`
: resets the fields to their initial values at entry to the window.

`Table`
: opens a Viewtable window for browsing the selected data set. This can assist you in locating the variable containing data you are looking for.

`Graph`
: opens the Time Series Viewer window to display the selected time series variable. You can switch to a different series in the Series Selection window without closing the Time Series Viewer window. Position the windows so they are both visible, or use the Next Viewer toolbar icon or F12 function key to switch between windows.

`Refresh`
: updates all fields and lists in the window. If you assign a new libname without exiting the Series Selection window, use the refresh action to update the Libraries list so that it will include the newly assigned libname. Also use the Refresh action to update the variables list if the input data set is changed.

Selection Lists

`Libraries`
: displays a list of currently assigned libnames. You can select a libname by clicking it, which is equivalent to typing its name in the Library field. If you cannot locate the library or directory you are interested in, go to the SAS Explorer window, select "New" from the File menu, then select "Library" and "OK." This opens the New Library dialog box. You also assign a libname by submitting a libname statement from the Editor window. Click the Refresh button to make the new libname available in the libraries list.

`SAS Data Sets`
: displays a list of the SAS data sets (data files or data views) located under the selected libname. You can select one of these by clicking it, which is equivalent to typing its name in the Data Set field.

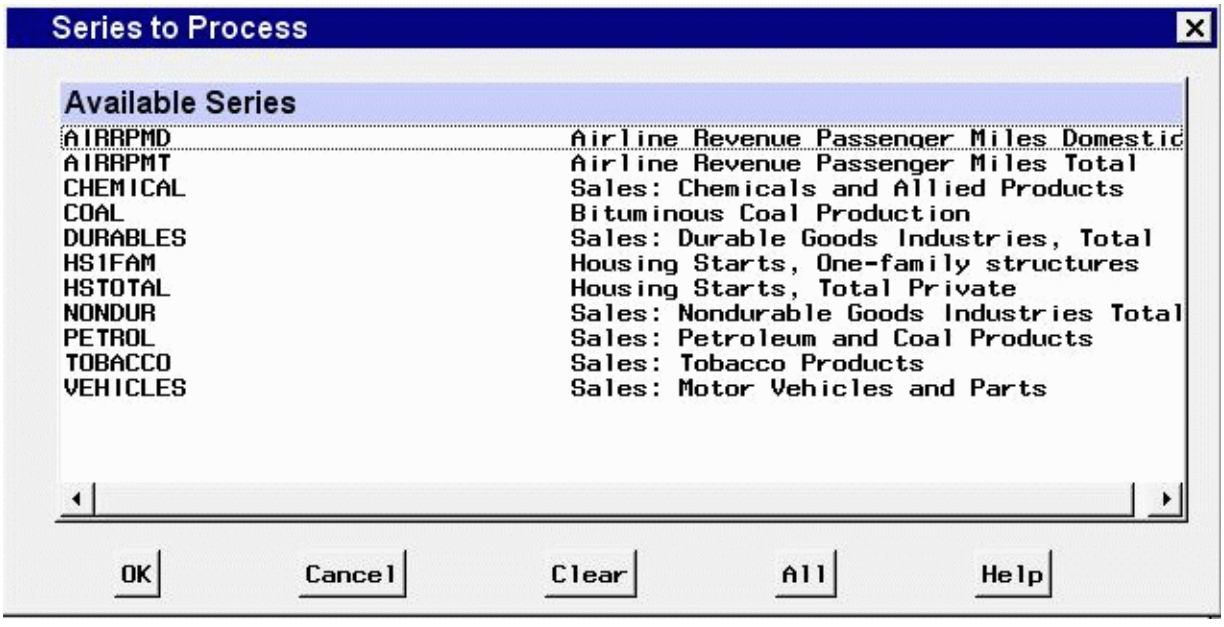
`Time Series Variables`
: displays a list of numeric variables contained within the selected data set. You can select one of these by clicking it, which is equivalent to typing its name in the Variable field. You can double-click a series to select it and exit the window.

Series to Process Window

Use the Series to Process window to select series for model fitting or forecasting. Access it by using the Select button in the Automatic Model Fitting and Produce Forecasts windows. Hold down the shift key or drag with the left mouse button for multiple selections. Use the control key for noncontiguous multiple selections. Once you make selections and click OK, the number of selected series and their names are listed in the Series to Process field of the calling window (with ellipses if not all the names will fit).

When invoked from Automatic Model Fitting, the Series to Process window shows all the numeric variables in the input data set except the time ID variable. These are the series which are currently available for model fitting.

When invoked from Produce Forecasts, the Series to Process window shows all the series in the input data set for which models have been fit. These are the series which are currently available for forecasting.



Controls and Fields

`OK`
: closes the window and applies the series selection(s) which have been made. At least one series must be selected.

`Cancel`
: closes the window, ignoring series selections which have been made, if any.

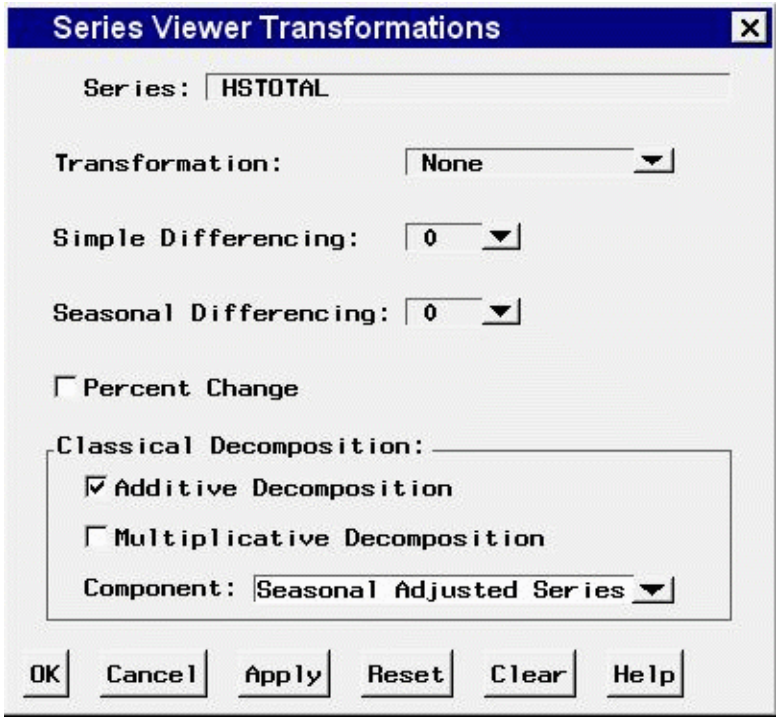
`Clear`
: deselects all series in the selection list.

`All`
: selects all series in the selection list.

Series Viewer Transformations Window

Use the Series Viewer Transformations window to view plots of transformations of the current series in the Time Series Viewer window. It provides a larger set of transformations than those available from the viewer window's toolbar. It is invoked by using "Other Transformations" under the Tools menu of the Time Series Viewer window. The options that you specify in this window are applied to the series displayed in the Time Series Viewer window when you select "OK" or "Apply."

Use the Apply button if you want to make repeated transformations to a series without having to close and reopen the Series Viewer Transformations window each time.



Controls and Fields

`Series`
: is the variable name for the current time series.

`Transformation`
: is the transformation applied to the time series displayed in the Time Series Viewer window. Select Log, Logistic, Square Root, Box-Cox, or none from the pop-up list.

`Simple Differencing`
: is the order of differencing applied to the time series displayed in the Time Series Viewer window. Select a number from 0 to 5 from the pop-up list.

`Seasonal Differencing`
: is the order of seasonal differencing applied to the time series displayed in the Time Series Viewer window. Select a number from 0 to 3 from the pop-up list.

`Percent Change`
: is a check box that if selected displays the series in terms of percent change from the previous period.

`Additive Decomposition`
: is a check box that produces a display of a selected series component derived by using additive decomposition.

`Multiplicative Decomposition`
: is a check box that produces a display of a selected series component derived using multiplicative decomposition.

`Component`
: selects a series component to display when either additive or multiplicative decomposition is turned on. You can display the seasonally adjusted component, the trend-cycle component, the seasonal component, or the irregular component—that is, the residual that remains after removal of the other components. The heading in the viewer window shows which component is currently displayed.

`OK`
: applies the transformation options you selected to the series displayed in the Time Series Viewer window and closes the Series Viewer Transformations window.

`Cancel`
: closes the Series Viewer Transformations window without changing the series displayed by the Time Series Viewer window.

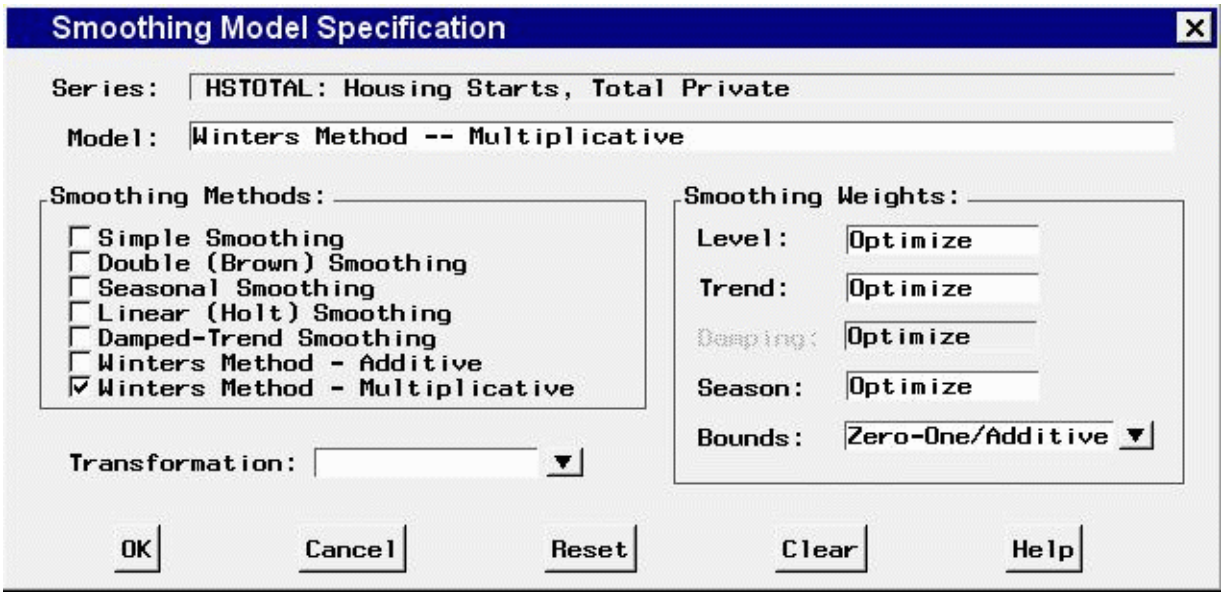
`Apply`
: applies the transformation options you selected to the series displayed in the Time Series Viewer window without closing the Series Viewer Transformations window.

`Reset`
: resets the transformation options to their initial values upon entry to the Series Viewer Transformations window.

`Clear`
: resets the transformation options to their default values (no transformations).

Smoothing Model Specification Window

Use the Smoothing Model Specification window to specify and fit exponential smoothing and Winters method models. Access it from the Develop Models window by using the Fit Model submenu of the Edit menu or from the pop-up menu when you click an empty area of the model table.



Controls and Fields

`Series`
is the name and variable label of the current series.

`Model`
is a descriptive label for the model that you specify. You can type a label in this field or allow the system to provide a label. If you leave the label blank, a label is generated automatically based on the options you specify.

`Smoothing Methods`

`Simple Smoothing`
specifies simple (single) exponential smoothing.

`Double (Brown) Smoothing`
specifies double exponential smoothing by using Brown's one parameter model (single exponential smoothing applied twice).

`Seasonal Smoothing`
specifies seasonal exponential smoothing. (This is like Winters method with the trend term omitted.)

`Linear (Holt) Smoothing`
specifies exponential smoothing of both the series level and trend (Holt's two parameter model).

`Damped-Trend Smoothing`
specifies exponential smoothing of both the series level and trend with a trend damping weight.

`Winters Method - Additive`
specifies Winters method with additive seasonal factors.

`Winters Method - Multiplicative`
specifies Winters method with multiplicative seasonal factors.

`Smoothing Weights`
displays the values used for the smoothing weights. By default, the Smoothing Weights fields are set to "optimize," which means that the system will compute the weight values that best fit the data. You can also type smoothing weight values in these fields.

`Level`
is the smoothing weight used for the level of the series.

`Trend`
is the smoothing weight used for the trend of the series.

`Damping`
is the smoothing weight used by the damped-trend method to damp the forecasted trend towards zero as the forecast horizon increases.

`Season`
is the smoothing weight used for the seasonal factors in Winters method and seasonal exponential smoothing.

`Transformation`
displays the series transformation specified for the model. When a transformation is specified, the model is fit to the transformed series, and forecasts are produced by applying the inverse transformation to the model predictions. Select `Log`, `Logistic`, `Square Root`, `Box-Cox`, or `None` from the pop-up list.

`Bounds`
displays the constraints imposed on the fitted smoothing weights. Select one of the following from the pop-up list:

`Zero-One/Additive`
sets the smoothing weight optimization region to the intersection of the region bounded by the intervals from zero (0.001) to one (0.999) and the additive invertible region. This is the default.

`Zero-One Boundaries`
sets the smoothing weight optimization region to the region bounded by the intervals from zero (0.001) to one (0.999).

`Additive Invertible`
sets the smoothing weight optimization region to the additive invertible region.

`Unrestricted`
sets the smoothing weight optimization region to be unbounded.

`Custom`
opens the `Smoothing Weights` window to enable you to customize the constraints for smoothing weights optimization.

`OK`
: closes the Smoothing Model Specification window and fits the model you specified.

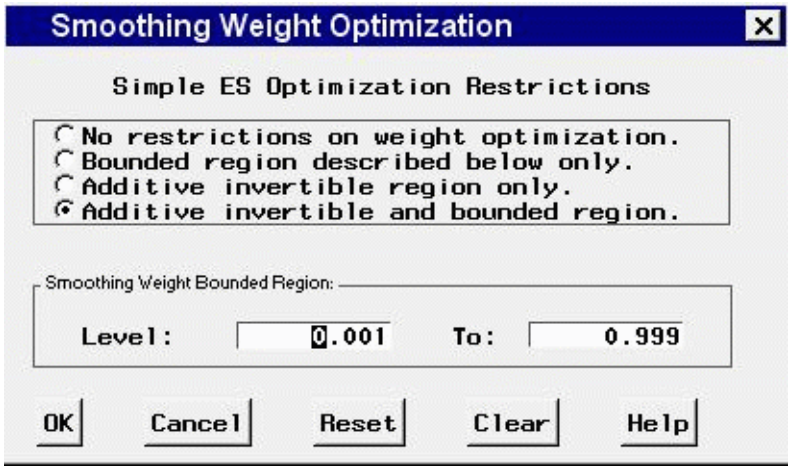
`Cancel`
: closes the Smoothing Model Specification window without fitting the model. Any options you specified are lost.

`Reset`
: resets all options to their initial values upon entry to the window. This might be useful when editing an existing model specification; otherwise, Reset has the same function as Clear.

`Clear`
: resets all options to their default values.

Smoothing Weight Optimization Window

Use the Smoothing Weight Optimization window to specify constraints for the automatic fitting of smoothing weights for exponential smoothing and Winters method models. Access it from the Smoothing Models Specification window when you select "Custom" in the "Bounds" combo box.



Controls and Fields

`No restrictions`
: when selected, specifies unrestricted smoothing weights.

`Bounded region`
: when selected, restricts the fitted smoothing weights to be within the bounds that you specify with the "Smoothing Weight Bounded Region" options.

`Additive invertible region`
: when selected, restricts the fitted smoothing weights to be within the additive invertible region of the parameter space of the ARIMA model equivalent to the smoothing model. (For more information, see the section "Smoothing Models" on page 4042.)

`Additive invertible and bounded region`
: when selected, restricts the fitted smoothing weights to be both within the additive invertible region and within bounds that you specify.

`Smoothing Weight Bounded Region`
: is a group of numeric entry fields that enable you to specify lower and upper limits on the fitted value of each smoothing weight. The fields that appear in this part of the window depend on the kind of smoothing model that you specified.

`OK`
: closes the window and sets the options that you specified.

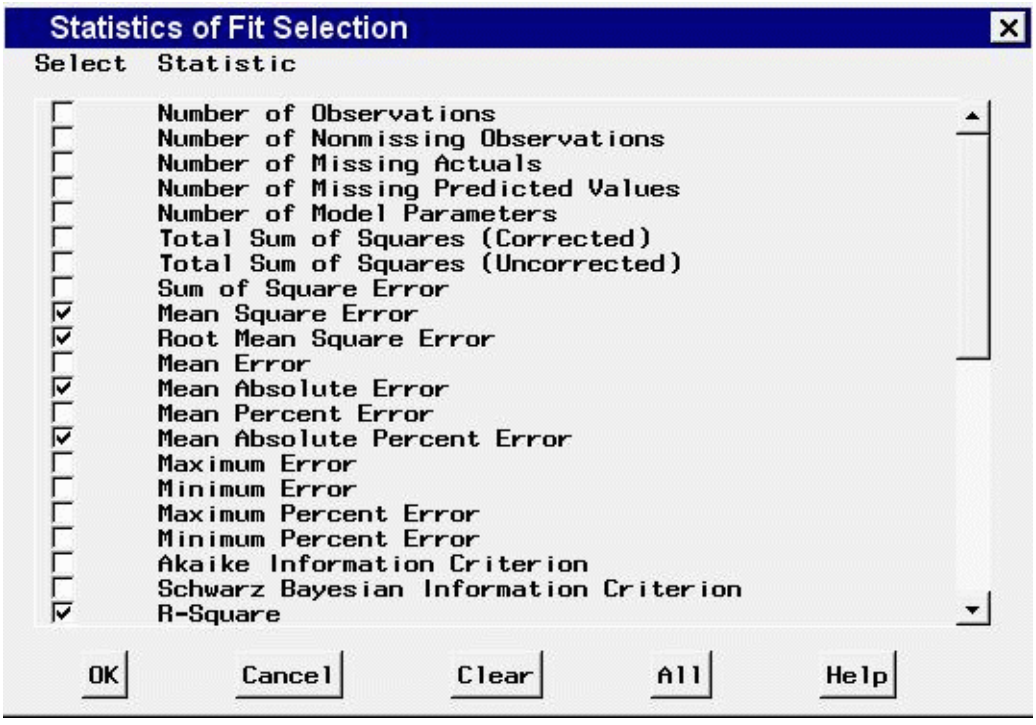
`Cancel`
: closes the window without changing any options. Any values you specified are lost.

`Reset`
: resets all options to their initial values upon entry to the window.

`Clear`
: resets all options to their default values.

Statistics of Fit Selection Window

Use the Statistics of Fit Selection window to specify which of the available goodness-of-fit statistics are reported for models you fit and are available for selection as the model selection criterion used by the automatic selection process. This window is available under the Options menu in the Develop Models, Automatic Model Fitting, Produce Forecasts, and Model List windows, and from the Statistics button in the Model Fit Comparison window and Automatic Model Fitting results windows.



Controls and Fields

`Select Statistics Table`
: list the available statistics. Select a row of the table to select or deselect the statistic shown in that row.

`OK`
: closes the window and applies the selections made.

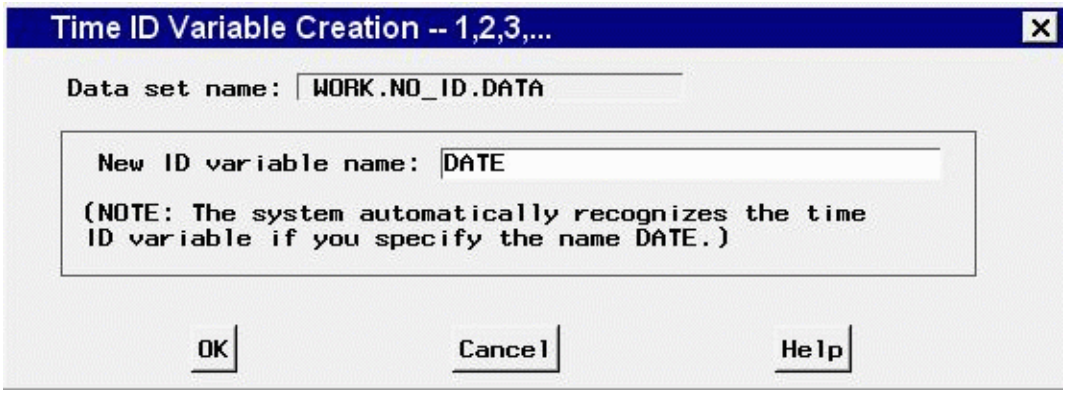
`Cancel`
: closes the window without applying any selections.

`Clear`
: deselects all statistics.

`All`
: selects all statistics.

Time ID Creation – 1,2,3 Window

Use the Time ID Creation – 1,2,3 window to add a time ID variable to an input data set with observation numbers as the ID values. The interval for the series will be 1. Use this approach if the data frequency does not match any of the system's date or date-time intervals, or if other methods of assigning a time ID do not work. To access this window, select "Create from observation numbers" from the Create pop-up list in any window where you can select a Time ID variable. For more information, see Chapter 4, "Date Intervals, Formats, and Functions," in this book.



Controls and Fields

`Data set name`
: is the name of the input data set.

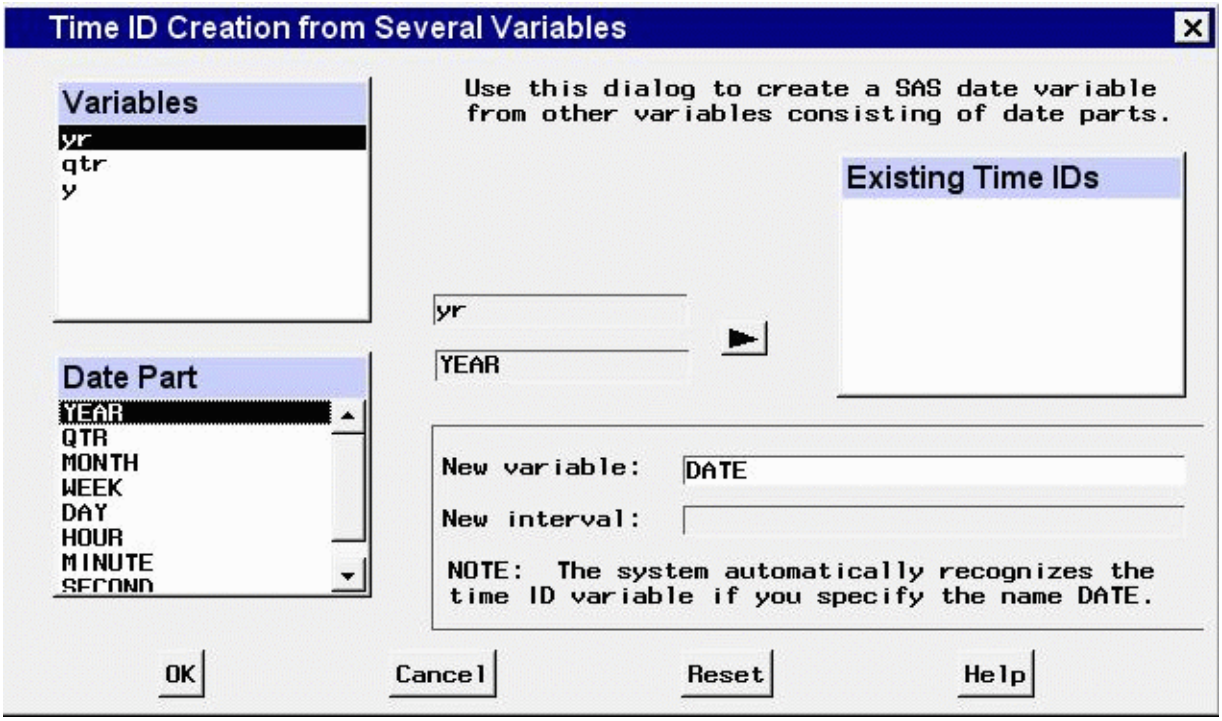
`New ID variable name`
: is the name of the time ID variable to be created. You can type any valid SAS variable name in this field.

`OK`
: closes the window and proceeds to the next step in the time ID creation process.

`Cancel`
closes the window without creating a Time ID variable. Any options you specified are lost.

Time ID Creation from Several Variables Window

Use the Time ID Creation from Several Variables window to add a SAS date valued time ID variable to an input data set when the input data set already contains several dating variables, such as day, month, and year. To access this window, select "Create from existing variables" from the Create pop-up list in any window where you can select a Time ID variable. For more information, see Chapter 57, "Creating Time ID Variables."



Controls and Fields

`Variables`
is a list of variables in the input data set. Select existing ID variables from this list.

`Date Part`
is a list of date parts that you can specify for the selected ID variable. For each ID variable that you select from the Variables list, select the Date Part value that describes what the values of the ID variable represent.

`arrow button`
moves the selected existing ID variable and date part specification to the "Existing Time IDs" list. Once you have done this, you can select another ID variable from the Variables list.

`New variable`
is the name of the time ID variable to be created. You can type any valid SAS variable name in this field.

`New interval`
is the time interval between observations in the input data set implied by the date part ID variables you have selected.

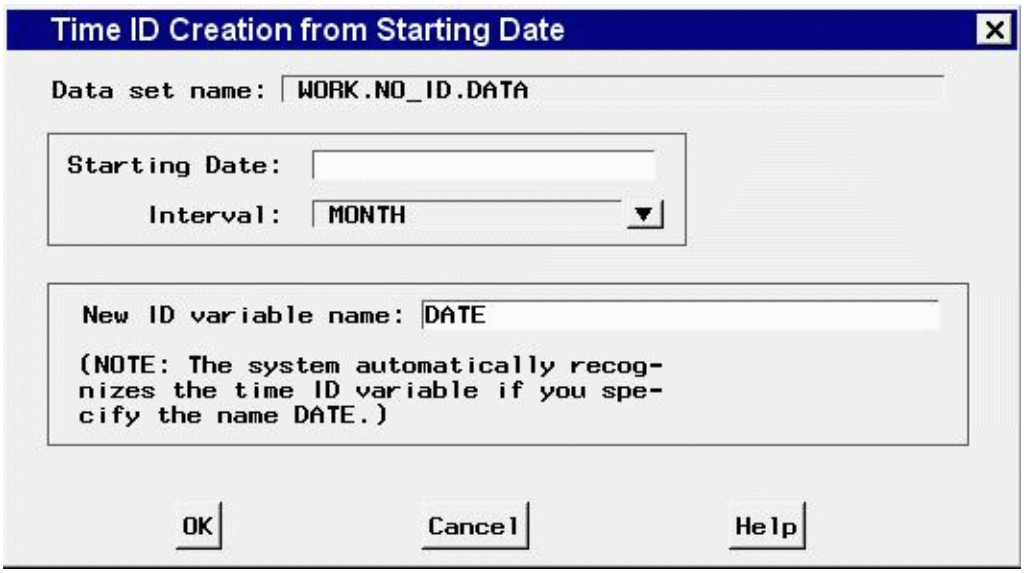
`OK`
closes the window and proceeds to the next step in the time ID creation process.

`Cancel`
closes the window without creating a time ID. Any options you specified are lost.

`Reset`
resets the options to their initial values upon entry to the window.

Time ID Creation from Starting Date Window

Use the Time ID Creation from Starting Date window to add a SAS date valued time ID variable to an input data set. This is a convenient way to add a time ID of any interval as long as you know the starting date of the series. To access this window, select "Create from starting date and frequency" from the Create pop-up list in any window where you can select a Time ID variable. For more information, see Chapter 57, "Creating Time ID Variables."



Controls and Fields

`Data set name`
is the name of the input data set.

`Starting Date`
: is the starting date for the time series in the data set. Enter a date value in this field, using a form recognizable by a SAS date informat, for example, 1998:1, feb1997, or 03mar1998.

`Interval`
: is the time interval between observations in the data set. Select an interval from the pop-up list.

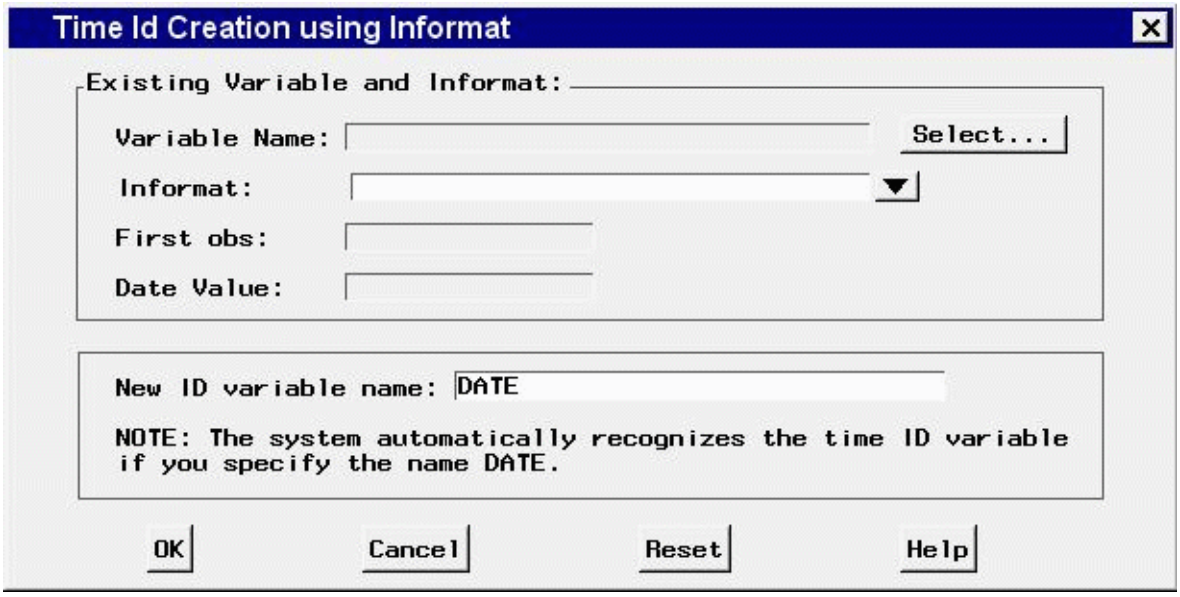
`New ID variable name`
: is the name of the time ID variable to be created. You can type any valid SAS variable name in this field.

`OK`
: closes the window and proceeds to the next step in the time ID creation process.

`Cancel`
: closes the window without changing the input data set. Any options you specified are lost.

Time ID Creation Using Informat Window

Use the Time ID Creation using Informat window to add a SAS date valued time ID variable to an input data set. Use this window if your data set contains a date variable that is stored as a character string. Using the appropriate SAS date informat, the date string is read in and used to create a date or date-time variable. To access this window, select "Create from existing variable/informat" from the Create pop-up list in any window where you can select a Time ID variable.



Controls and Fields

`Variable Name`
: is the name of an existing ID variable in the input data set. Click the Select button to select a variable.

`Select button`
: opens a list of variables in the input data set for you to select from.

`Informat`
: is a SAS date or datetime informat for reading date or datetime value from the values of the specified existing ID variable. You can type in an informat or select one from the pop-up list.

`First Obs`
: is the value of the variable you selected from the first observation in the data set, displayed here for convenience.

`Date Value`
: is the SAS date or datetime value read from the first observation value that uses the informat that you specified.

`New ID variable name`
: is the name of the time ID variable to be created. You can type any valid SAS variable name in this field.

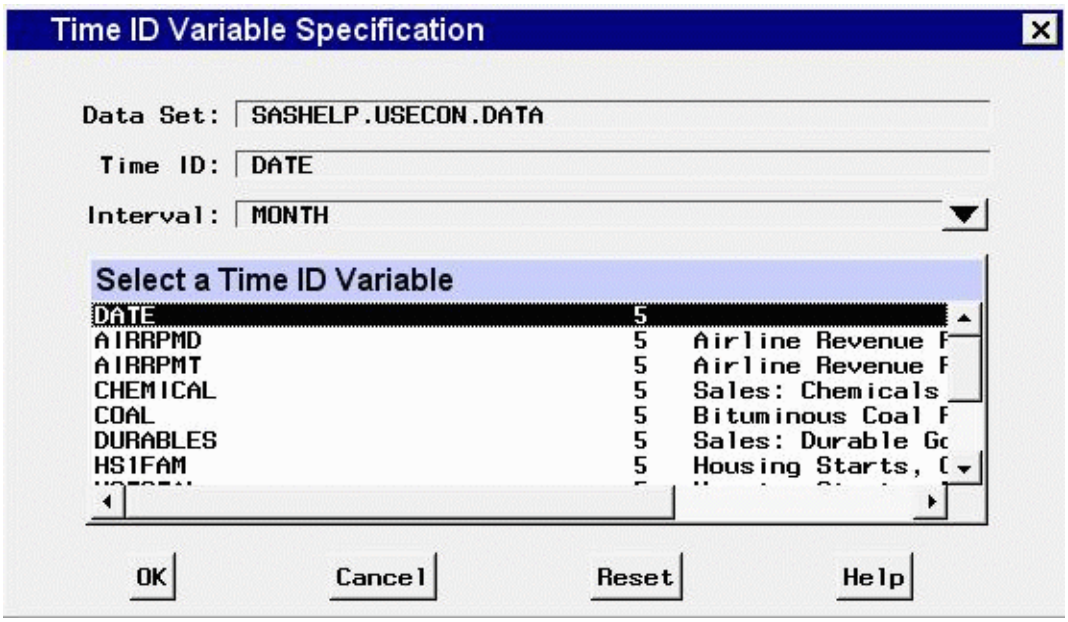
`OK`
: closes the window and proceeds to the next step in the time ID creation process.

`Cancel`
: closes the window without changing the input data set. Any options you specified are lost.

`Reset`
: resets the options to their initial values upon entry to the window.

Time ID Variable Specification Window

Use the Time ID Variable Specification window to specify a variable in the input data set that contains the SAS date or datetime value of each observation. You do not need to use this window if your time ID variable is named `date`, `time`, or `datetime`, since these are picked up automatically. Invoke the window from the Select button to the right of the Time ID field in the Data Set Selection, Automatic Model Fitting, Produce Forecasts, Series Selection, and Time Series Forecasting windows.



Controls and Fields

`Data Set`
is the name of the current input data set.

`Time ID`
is the name of the currently selected Time ID variable, if any.

`Interval`
is the time interval between observations (data frequency) in the input data set.

`Select a Time ID Variable`
is a selection list of variables in the input set. Select one variable to assign it as the Time ID variable.

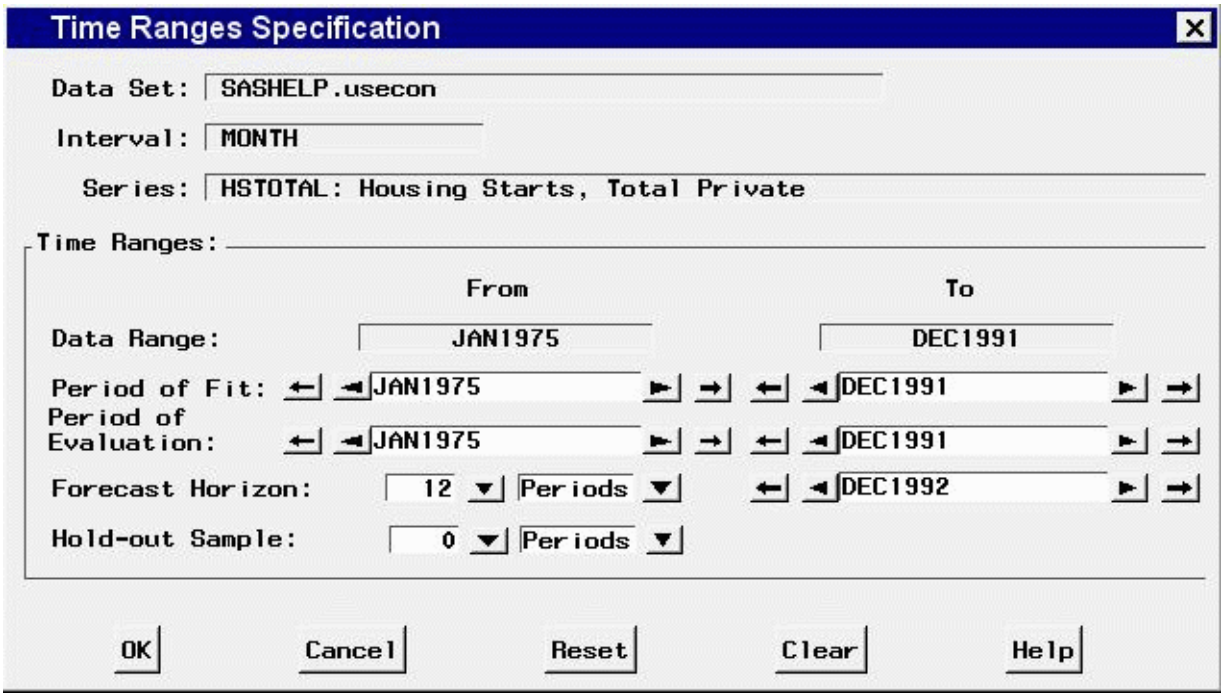
`OK`
closes the window and retains the selection made, if it is a valid time ID.

`Cancel`
closes the window and ignores any selection made.

`Reset`
restores the time ID variable to the one assigned when the window was initially opened, if any.

Time Ranges Specification Window

Use the Time Ranges Specification window to control the period of fit and evaluation and the forecasting horizon. Invoke this window from the Options menu in the Develop Models, Manage Forecasting Project, and Model Viewer windows or the Set Ranges button in the Develop Models window.



Controls and Fields

`Data Set`
: is the name of the current input data set.

`Interval`
: is the time interval (data frequency) for the input data set.

`Series`
: is the variable name and label of the current time series.

`Data Range`
: gives the date of the first and last nonmissing data values available for the current series in the input data set.

`Period of Fit`
: gives the starting and ending dates of the period of fit. This is the time range used for estimating model parameters. By default, it is the same as the data range. You can type dates in these fields, or you can use the arrow buttons to the left and right of the date fields to decrement or increment the date values shown. Date values must be entered in a form recognized by a SAS date informat. (See *SAS Language Reference: Concepts* for information about SAS date informats.) The inner arrows increment by periods, the outer arrows increment by larger amounts, depending on the data interval.

`Period of Evaluation`
: gives the starting and ending dates of the period of evaluation. This is the time range used for evaluating models in terms of statistics of fit. By default, it is the same as the data range. You can type dates in these fields, or you can use the control arrows to the left and right of the date fields to decrement or increment the date values shown. Date values must be entered in a form recognized by a SAS date informat. (See *SAS Language Reference: Concepts* for information about SAS date informats.) The inner arrows increment by periods, the outer arrows increment by larger amounts, depending on the data interval.

`Forecast Horizon`
: is the forecasting horizon expressed as a number of forecast periods or number of years (or number of weeks for daily data). You can type a number or select one from the pop-up list. The ending date for the forecast period is automatically updated when you change the number of forecasts periods.

`Forecast Horizon – Units`
: indicates whether the Forecast Horizon value represents periods or years (or weeks for daily data).

`Forecast Horizon Date Value`
: is the date of the last forecast observation. You can type a date in this field, or you can use the arrow buttons to the left and right of the date field to decrement or increment the date values shown. Date values must be entered in a form recognized by a SAS date informat. (For information about SAS date informats, see *SAS Language Reference: Concepts*.) The Forecast Horizon is automatically updated when you change the ending date for the forecast period.

`Hold-out Sample`
: specifies that a number of observations or years (or weeks) of data at the end of the data range be used for the period of evaluation with the remainder of data used as the period of fit. You can type a number in this field or select one from the pop-up list. When the hold-out sample value is changed, the Period of Fit and Period of Evaluation ranges are changed to reflect the hold-out sample specification.

`Hold-out Sample – Units`
: indicates whether the hold-out sample field represents periods or years (or weeks for daily data).

`OK`
: closes the window and stores the specified changes.

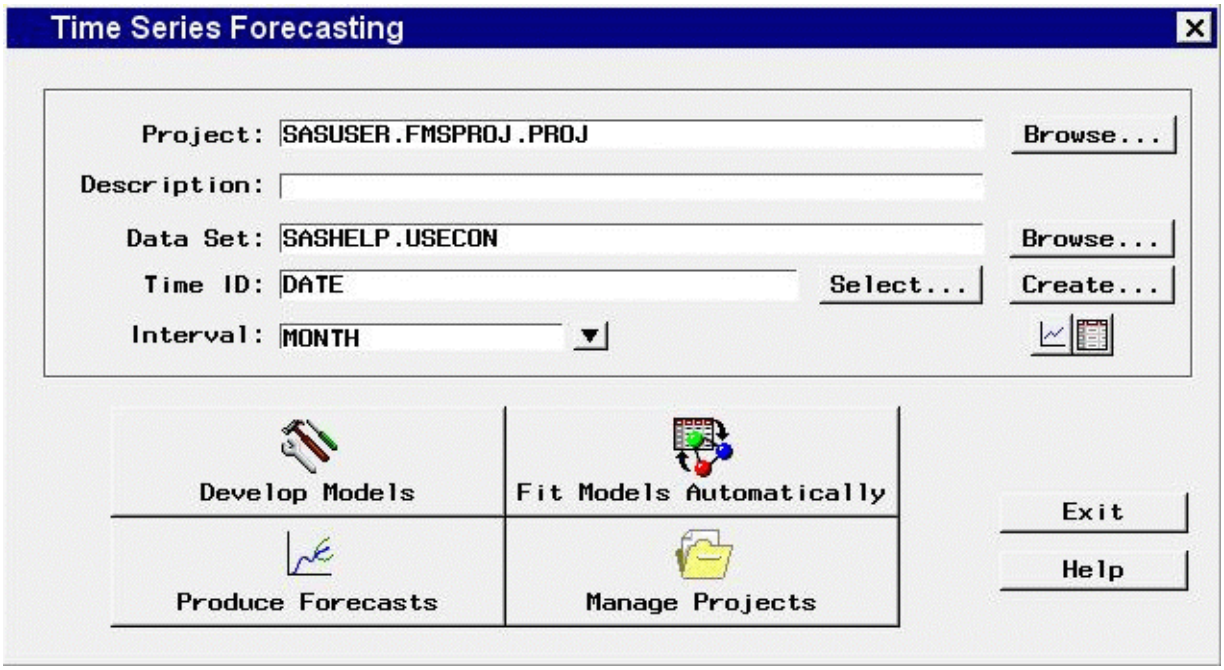
`Cancel`
: closes the window without saving changes. Any options you specified are lost.

`Reset`
: resets the options to their initial values upon entry to the window.

`Clear`
: resets all options to their default values.

Time Series Forecasting Window

The Time Series Forecasting window is the main application window that appears when you invoke the Time Series Forecasting System. It enables you to specify a project file and an input data set and provides access to the other windows described in this chapter.



Controls and Fields

`Project`
: is the name of the SAS catalog entry in which forecasting models and other results will be stored and from which previously stored results are loaded into the forecasting system. You can specify the project by typing a SAS catalog entry name in this field or by clicking the Browse button to right of this field. If you specify the name of an existing catalog entry, the information in the project file is loaded. If you specify a one-level name, the catalog name is assumed to be `fmsproj` and the library is assumed to be `sasuser`. For example, `samproj` is equivalent to `sasuser.fmsproj.samproj`.

Project `Browse` button
: opens the Forecasting Project File Selection window to enable you to select and load the project from a list of previously stored projects.

`Description`
: is a descriptive label for the forecasting project. The description you type in this field will be stored with the catalog entry shown in the Project field.

`Data Set`
: is the name of the current input data set. To specify the input data set, you can type the data set name in this field or use the Browse button to the right of the field.

Data set `Browse` button
: opens the Data Set Selection window to enable you to select the input data set.

`Time ID`
: is the name of the ID variable for the input data set. To specify the ID variable, you can type the ID variable name in this field or use the Select button. If the time ID variable is named `date`, `time`, or `datetime`, it is automatically picked up by the system.

`Select` button
: opens the Time ID Variable Specification window.

`Create` button
: opens a menu of choices of methods for creating a time ID variable for the input data set. Use this feature if the input data set does not already contain a valid time ID variable.

`Interval`
: is the time interval between observations (data frequency) in the current input data set. If the interval is not automatically filled in, you can type an interval name or select one from the pop-up list. For more information about intervals, see the section "Time Series Data Sets, ID Variables, and Time Intervals" on page 3774.

`View Series Graphically` icon
: opens the Time Series Viewer window to display plots of series in the current input data set.

`View Data as a Table`
: opens a Viewtable window for browsing the selected input data set.

`Develop Models`
: opens the Develop Models window to enable you to fit forecasting models to individual time series and choose the best models to use to produce the final forecasts of each series.

`Fit Models Automatically`
: opens the Automatic Model Fitting window for applying the automatic model selection process to all series or to selected series in an input data set.

`Produce Forecast`
: opens the Produce Forecasts window for producing forecasts for the series in the current input data set for which you have fit forecasting models.

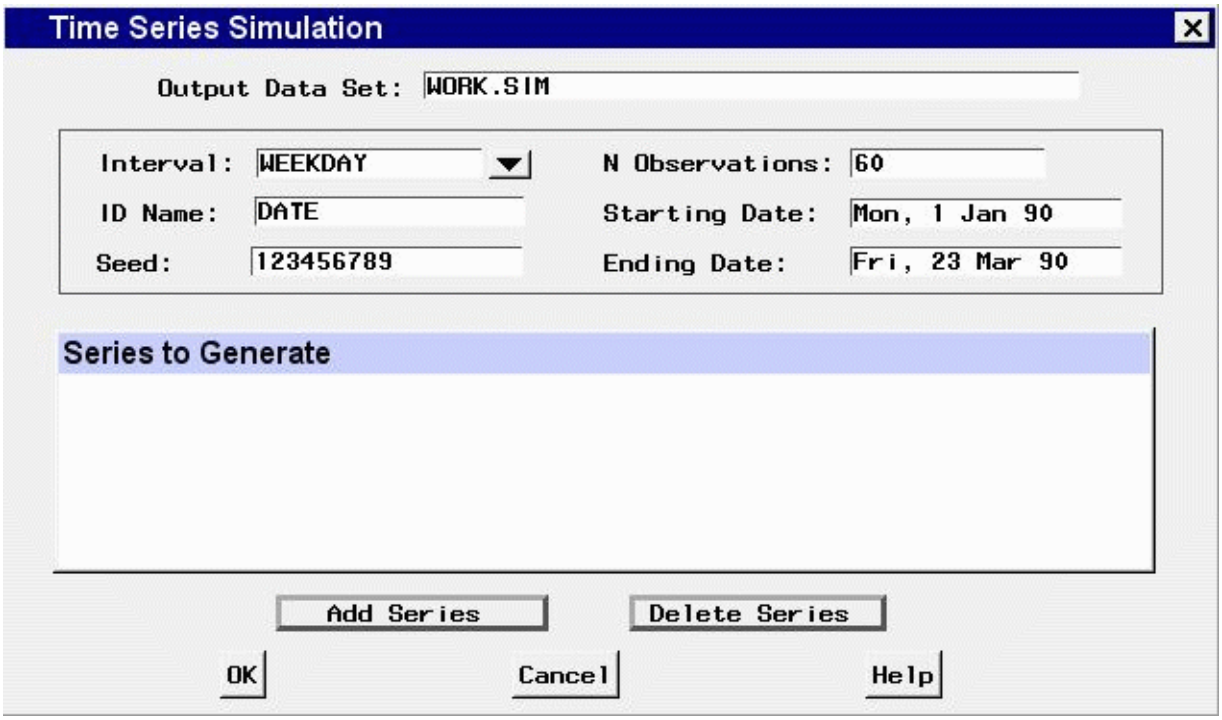
`Manage Projects`
: opens the Manage Forecasting Project window for viewing or editing information stored in projects.

`Exit`
: closes the Time Series Forecasting system.

`Help`
: accesses the help system.

Time Series Simulation Window

Use the Time Series Simulation window to create a data set of simulated series generated by ARIMA processes. Access this window from the Tools menu in the Develop Models and Manage Forecasting Project windows.



Controls and Fields

`Output Data Set`
: is the name of the data set to be created. Type in a one-level or two-level SAS data set name.

`Interval`
: is the time interval between observations (data frequency) in the simulated data set. Type in an interval name or select one from the pop-up list.

`Seed`
: is the seed for the random number generator used to produce the simulated time series.

`N Observations`
: is the number of time periods to simulate.

`Starting Date`
: is the starting date for the simulated observations. Type in a date in a form recognizable by a SAS data informat, for example, 1998:1, feb1997, or 03mar1998.

`Ending Date`
: is the ending date for the simulated observations. Type in a date in a form recognizable by a SAS data informat.

`Series to Generate`
: is the list of variable names and ARIMA processes to simulate.

`Add Series`
: opens the ARIMA Process Specification window to enable you to add entries to the Series to Generate list.

`Delete Series`
: deletes selected (highlighted) entries from the Series to Generate list.

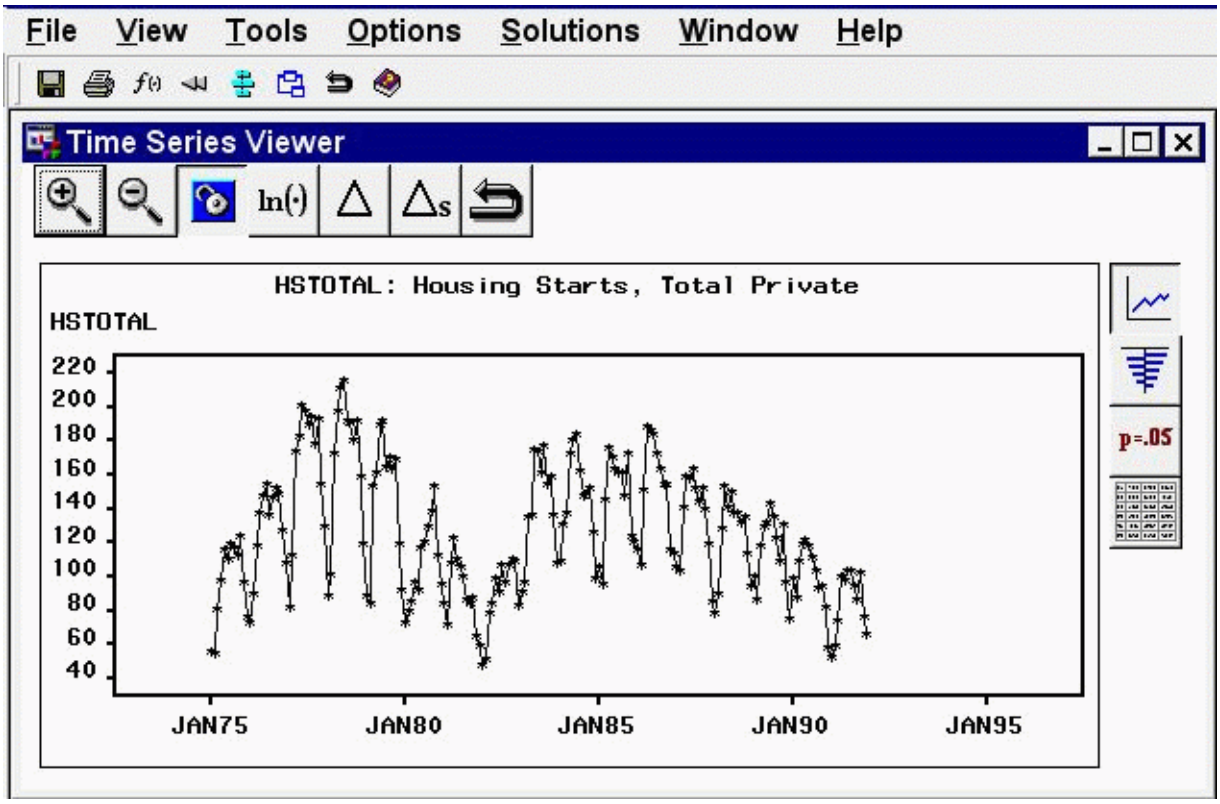
`OK`
: closes the Time Series Simulation window and performs the specified simulations and creates the specified data set.

`Cancel`
: closes the window without creating a simulated data set. Any options you specified are lost.

Time Series Viewer Window

Use the Time Series Viewer window to explore time series data using plots, transformations, statistical tests, and tables. It is available as a stand-alone application and as part of the Time Series Forecasting System. To use it as a stand-alone application, select it from the Analysis submenu of the Solutions menu, or use the `tsview` command (see Chapter 61, "Command Reference," in this book). To use it within the Time Series Forecasting System, select the View Series Graphically icon in the Time Series Forecasting, Develop Models, or Model List window, or select "Series" from the View menu of the Develop Models, Manage Project, or Model List window.

The various plots and tables available are referred to as *views*. The section "View Selection Icons" on page 3991 explains how to change the view.



The state of the Time Series Viewer window is controlled by the current series, the current series transformation specification, and the currently selected view. You can resize this window, and you can use other windows without closing the Time Series Viewer window. You can explore a number of series conveniently

by keeping the Series Selection window open. Each time you make a selection, the viewer window is updated to show the selected series. Keep both windows visible, or switch between them by using the Next Viewer toolbar icon or the F12 function key.

You can open multiple Time Series Viewer windows. This enables you to "freeze"a plot so you can come back to it later, or compare two plots side by side on your screen. To do this, unlink the viewer by using the Link/Unlink icon on the window's toolbar or the corresponding item in the Tools menu. While the viewer window remains unlinked, it is not updated when other selections are made in the Series Selection window. Instead, when you select a series and click the Graph button, a new Time Series Viewer window is invoked. You can continue this process to open as many viewer windows as you want. The Next Viewer icon and corresponding F12 function key are useful for navigating between windows when they are not simultaneously visible on your screen.

A wide range of series transformations is available. Basic transformations are available from the window's horizontal toolbar, and others are available by selecting "Other Transformations" from the Tools menu.

Horizontal Tool Bar

The Time Series Viewer window contains a horizontal toolbar with the following icons:

`Zoom in`
: changes the mouse pointer into cross hairs that you can use with the left mouse button to drag out a region of the time series plot to zoom in on. In the Autocorrelations view and the White Noise and Stationarity Tests view, Zoom In reduces the number of lags displayed.

`Zoom out`
: reverses the previous Zoom In action and expands the time range of the plot to show more of the series. In the Autocorrelations view and the White Noise and Stationarity Tests view, Zoom Out increases the number of lags displayed.

`Link/Unlink viewer`
: disconnects or connects the Time Series Viewer window to the window in which the series was selected. When the Viewer is linked, it always shows the current series. If you select another series, linked Viewers are updated. Unlinking a Viewer freezes its current state, and changing the current series has no effect on the Viewer's display. The View Series action creates a new Series Viewer window if there is no linked Viewer. By using the unlink feature, you can open several Time Series Viewer windows and display several different series simultaneously.

`Log Transform`
: applies a log transform to the current view. This can be combined with other transformations; the current transformations are shown in the title.

`Difference`
: applies a simple difference to the current view. This can be combined with other transformations; the current transformations are shown in the title.

`Seasonal Difference`
: applies a seasonal difference to the current view. For example, if the data are monthly, the seasonal cycle is one year. Each value has subtracted from it the value from one year previous. This can be combined with other transformations; the current transformations are shown in the title.

`Close`
: closes the Time Series Viewer window and returns to the window from which it was invoked.

Vertical Toolbar View Selection Icons

At the right-hand side of the Time Series Viewer window is a vertical toolbar used to select the kind of plot or table that the Viewer displays.

`Series`
displays a plot of series values over time.

`Autocorrelations`
displays plots of the sample autocorrelations, partial autocorrelation, and inverse autocorrelation functions for the series, with lines overlaid at plus and minus two standard errors.

`White Noise and Stationarity Tests`
displays horizontal bar charts that represent results of white noise and stationarity tests. The first bar chart shows the significance probability of the Ljung-Box chi-square statistic computed on autocorrelations up to the given lag. Longer bars favor rejection of the null hypothesis that the series is white noise. Click any of the bars to display an interpretation.

The second bar chart shows tests of stationarity, where longer bars favor the conclusion that the series is stationary. Each bar displays the significance probability of the augmented Dickey-Fuller unit root test to the given autoregressive lag. Long bars represent higher levels of significance against the null hypothesis that the series contains a unit root. For seasonal data, a third bar chart appears for seasonal root tests. Click any of the bars to display an interpretation.

`Data Table`
displays a data table containing the values in the input data set.

Menu Bar

`File`

`Save Graph`
saves the current plot as a SAS/GRAPH grseg catalog entry in a default or most recently specified catalog. This item is unavailable in the Data Table view.

`Save Graph as`
saves the current graph as a SAS/GRAPH grseg catalog entry in a SAS catalog that you specify and/or as an Output Delivery System (ODS) object. By default, an HTML page is created, with the graph embedded as a gif image. This item is unavailable in the Data Table view.

`Save Data`
saves the data displayed in the viewer window to an output SAS data set. This item is unavailable in the Series view.

`Save Data as`
saves the data in a SAS data set that you specify and/or as an Output Delivery System (ODS) object. By default, an HTML page is created, with the data displayed as a table.

`Import Data`
is available if you license SAS/ACCESS software. It opens an Import Wizard, which you can use to import your data from an external spreadsheet or database to a SAS data set for use in the Time Series Forecasting System.

`Export Data`
: is available if you license SAS/ACCESS software. It opens an Export Wizard, which you can use to export a SAS data set, such as a forecast data set created with the Time Series Forecasting System, to an external spreadsheet or database.

`Print Graph`
: prints the plot displayed in the viewer window. This item is unavailable in the Data Table view.

`Print Data`
: prints the data displayed in the viewer window. This item is unavailable in the Series view.

`Print Setup`
: opens the Print Setup window, which allows you to access your operating system print setup.

`Print Preview`
: opens a preview window to show how your plots will look when printed.

`Close`
: closes the Time Series Viewer window and returns to the window from which it was invoked.

`View`

`Series`
: displays a plot of series values over time. This has the same function as the Series icon on the vertical toolbar.

`Autocorrelations`
: displays plots of the sample autocorrelation, partial autocorrelation, and inverse autocorrelation functions for the series. This has the same function as the Autocorrelations icon on the vertical toolbar.

`White Noise and Stationarity Tests`
: displays horizontal bar charts representing results of white noise and stationarity tests. This has the same function as the White Noise and Stationarity Tests icon on the vertical toolbar.

`Data Table`
: displays a data table containing the values in the input data set. This has the same function as the Data Table icon on the vertical toolbar.

`Zoom In`
: zooms the display. This has the same function as the Zoom In icon on the window's horizontal toolbar.

`Zoom Out`
: undoes the last zoom in action. This has the same function as the Zoom Out icon on the window's horizontal toolbar.

`Zoom Way Out`
: reverses all previous Zoom In actions and expands the time range of the plot to show all of the series, or shows the maximum number of lags in the Autocorrelations View or the White Noise and Stationarity Tests view.

`Tools`

`Log Transform`
: applies a log transformation. This has the same function as the Log Transform icon on the window's horizontal toolbar.

`Difference`
: applies simple differencing. This has the same function as the Difference icon on the window's horizontal toolbar.

`Seasonal Difference`
: applies seasonal differencing. This has the same function as the Seasonal Difference icon on the window's horizontal toolbar.

`Other Transformations`
: opens the Series Viewer Transformations window to enable you to apply a wide range of transformations.

`Diagnose Series`
: opens the Series Diagnostics window to determine the kinds of forecasting models appropriate for the current series.

`Define Interventions`
: opens the Interventions for Series window to enable you to edit or add intervention effects for use in modeling the current series.

`Link Viewer`
: connects or disconnects the Time Series Viewer window to the window from which series are selected. This has the same function as the Link item on the window's horizontal toolbar.

`Options`

`Number of Lags`
: opens a window to let you specify the number of lags shown in the Autocorrelations view and the White Noise and Stationarity Tests view. You can also use the Zoom In and Zoom Out actions to control the number of lags displayed.

`Correlation Probabilities`
: controls whether the bar charts in the Autocorrelations view represent significance probabilities or values of the correlation coefficient. A check mark or filled check box next to this item indicates that significance probabilities are displayed. In each case the bar graph horizontal axis label changes accordingly.

Mouse Button Actions

You can examine the data value and date of individual points in the Series view by clicking them. The date and value are displayed in a box that appears in the upper right corner of the Viewer window. Click the mouse elsewhere or select any action to dismiss the data box.

You can examine the values of the bars and confidence limits at different lags in the Autocorrelations view by clicking individual bars in the vertical bar charts.

You can display an interpretation of the tests in the White Noise and Stationarity Tests view by clicking the bars.

When you select the Zoom In action, you can use the mouse to define a region of the graph to take a closer look at. Position the mouse pointer at one corner of the region, press the left mouse button, and move the mouse pointer to the opposite corner of the region while holding the left mouse button down. When you release the mouse button, the plot is redrawn to show an expanded view of the data within the region you selected.

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