

Point-and-Click  
Access to the  
Power of SAS®

# The Little SAS® Enterprise Guide® Book

*Susan J. Slaughter and Lora D. Delwiche*





THE POWER TO KNOW®

Litt

A large, vertical rectangular frame with a thick black border. In the upper right corner of the white interior, there is a small, solid black square. To the right of this square, the letters 'Litt' are written in a large, bold, black serif font. A short horizontal line is positioned below the 't'.



*Susan J. Slaughter*



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## **The Little SAS® Enterprise Gui**

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# Contents

**About SAS Enterprise**  
**About This Book** xi  
**Acknowledgments** x

## Tutorials Section

### **Tutorial A Getting Start**

Starting SAS En

SAS Enterprise C

Basic elements c

Entering data .

Creating a frequ

Creating a scatter

Adding a note to

Saving the project

## **Tutorial B Creating Reports**

Before beginning

Starting SAS Enterprise Guide

Opening the Tools menu

Creating a simple report

Changing titles and subtitles

Changing column widths

Defining your own styles

Adding manual page numbers

Selecting a style

Changing the orientation

Completing the report

## **Tutorial C Working with Data**

Before beginning

Starting SAS Enterprise Guide

Opening the Variables view

Opening the Quantities view

Selecting columns



## **iv** *Contents*

Creating a new table  
Ordering and reordering data  
Filtering data  
Sorting the data  
Completing the table

## **Tutorial D Joining Two Tables**

Before beginning  
Starting SAS Enterprise Guide  
Opening the two tables  
Joining tables  
Filtering the data  
Selecting which rows  
Completing the table

## **Reference Section**

## **Chapter 1    SAS Enterprise Miner**

1.1   SAS Enterprise Miner

1.2   Projects   **1**

1.3   Maximizing Your View

1.4   Managing Projects

1.5   Running Projects

1.6   Linking Items

1.7   SAS Data Transformations

1.8   Viewing Projects

1.9   Changing Item Properties

1.10   Selected Statistics

1.11   Documenting Projects



## **Chapter 2 Bringing Data into SAS**

2.1 Sources of Data

2.2 Locations of Data

2.3 Assigning Paths

2.4 Creating New Variables

2.5 Editing SAS Data

2.6 Inserting Cells

2.7 Importing N

2.8 Importing L

2.9 Importing F

2.10 Exporting Data

## **Chapter 3 Working with SAS Data**

3.1 Finding and Selecting Data

3.2 Selecting Data by Position

3.3 Reopening Data

3.4 Customizing Data

3.5 Applying Styles

2.6 Defining Variables

3.6 Defining U

3.7 Defining Yo

3.8 Applying U

3.9 Grouping D

3.10 Saving Tas

3.11 Changing t

3.12 Changing t

3.13 Customizir

3.14 Exporting ]

## **Chapter 4 Producing**

4.1 Creating Si

4.2 Adding Sta

4.3 Changing ]

4.4 Changing C  
Summary ]

4.5 Changing ]

4.6 Changing ]



**vi** *Contents*

**Chapter 5    Modifying**

- 5.1 Creating a C
- 5.2 Selecting C
- 5.3 Creating Co
- 5.4 Creating Co
- 5.5 Selected Fu
- 5.6 Adding a C
- 5.7 Adding Su
- 5.8 Creating Si
- 5.9 Recoding V
- 5.10 Changing t

**Chapter 6    Sorting and**

- 6.1 Filtering Da
- 6.2 Using the Fi
- 6.3 Using the Sc
- 6.4 Sorting Dat

6.5 Filtering Data

6.6 Creating Categories

6.7 Creating Actions

## **Chapter 7 Combining Data**

7.1 Methods for Combining Data

7.2 Appending

7.3 Joining Tables

7.4 Setting the Index

## **Chapter 8 Basic Statistics**

8.1 Writing and Reading SAS Data

8.2 Creating PROCESSES

8.3 Viewing PROCESSES

8.4 Saving SAS Data

8.5 Using Tasks



## **Appendix A Data Used in**

**A Data Used**

**Tours Dat**

**Tour Date**

**Tour Book**

**Volcanoes**

**Eruptions**

**Latitude a**

**Portland F**

**Seattle Fli**

**Advertisin**

**Index 303**





**viii** *Contents*





## About SAS Enterprise Gu

For over four decades, SAS software has been used to manipulate and analyze data. Today, it is used in over 100 countries and at more than 80,000 organizations worldwide. SAS is known for its broad flexibility and deep statistical analysis capabilities.

### **What SAS Enterprise Guide Does**

SAS Enterprise Guide is a graphical user interface (GUI) for running SAS programs. It allows users to interact with SAS via a point-and-click interface. When a user performs an action in SAS Enterprise Guide, it generates SAS code. For example, if a user selects the "Summary" procedure from the menu, SAS Enterprise Guide generates the corresponding SAS code for the Summary procedure. There are over 90 such procedures available in SAS Enterprise Guide. When a user runs a procedure in SAS Enterprise Guide, it sends the results (such as reports, plots, and tables) back to SAS Enterprise Guide so that you can see them.

**SAS  
Enterprise  
Guide**

You don't have to be a programmer to use the SAS program that SAS Enterprise Guide provides. You can edit the programs written by SAS programmers or you can write a SAS program from scratch. Then you can run your SAS program in SAS Enterprise Guide. SAS Enterprise Guide meets the needs of programmers.

**What software you need** To Enterprise Guide software. SAS Enterprise Guide runs in a Windows environment. Because SAS Enterprise Guide is a client application, you will need a machine on which Base SAS is installed. Enterprise Guide can run on the same machine where SAS Enterprise Guide is installed (the server) or it may be a separate machine. Enterprise Guide runs in environments and on many types of machines as long as you have access to that machine.

You may have more than one SAS  
your desktop computer and on a r  
Guide to run analyses on either co

SAS has many different products. If you have Base SAS software installed on your computer, you will need a product called SAS/STAT to perform statistical analysis. If you want to use SAS/ETS software, you must also have SAS/STAT software installed. For the graphics component, you will need to have SAS/GRAPH software installed.

**DATA/ECHO SOFTWARE. FOR THE GRAPHIC**

## **x** *The Little SAS Enterprise Guide Book*

software. You may or may not need these features depending on your needs. (See section 2.1 for more information about what SAS Enterprise Guide can do.)

**Getting Help** We have tried to make it easy for you to get help. In addition, SAS Enterprise Guide has a Help menu, and documentation for SAS Enterprise Guide is available on the SAS Web site, **support.sas.com**. This site also contains the SAS Enterprise Guide—an online forum where you can post questions and contact SAS Technical Support. Whether you have a question that is answered online, or the support is available via e-mail, SAS sites have access to SAS Technical Support.

There are several ways to contact SAS Technical Support. You can visit the **support.sas.com**, or via phone at (800) 727-7165. To contact SAS Technical Support, you must know your site number and SAS version. To find these, start SAS Enterprise Guide and click the About SAS Enterprise Guide window. The About window displays your site number.





# About This Book

This book is divided into two distinct sections: a **Tutorials section** and a **Reference section**. Each tutorial is contained in its own chapter.

**Tutorials section** If you are new to SAS Enterprise Guide, start with the tutorials. Each of the four tutorials shows you how to perform a task, from starting SAS Enterprise Guide to creating reports. The tutorials are self-contained so you can do them in any order. By the time you finish the tutorials, you should be able to complete most tasks in SAS Enterprise Guide.

**Reference section** Once you have completed the tutorials, you can use the reference section. This is where you find detailed explanations of how to use SAS Enterprise Guide features, such as join data tables, or a detailed explanation of how to use a specific function. In addition to the topics covered in the tutorials, the reference section covers many other topics. You can find the reference section in just two pages so you can read it quickly.

**The data for this book** The data for this book is based on a fictional theme: the Fire and Ice Tours company. The company offers tours of the world. Using a small number of tour operators, the company offers a variety of data for every example. The data is included in the examples, but to make it easier to use, the data is also available for download.

Internet. Appendix A contains bot



**xii**      *The Little SAS Enterprise Guide Book*







## Acknowledgments

How do you describe something that's not static screen shots? That's the function we have struggled at every point: finding little points of confusion that are likely to arise in sentences in an effort to express ideas before we are nearing the completion of the book.

"Zounds! I

Fortunately, we've had plenty of help along the way, and we thank our technical reviewers: Michael Tamburro; our technical publishing specialist: Cindy Purye; and our marketing specialist: Cindy Purye. All these people worked hard to ensure the book was successful. We also thank Stacey Hamilton, our developer, for her work on the book.

And, as always, we thank our families for their support and understanding.

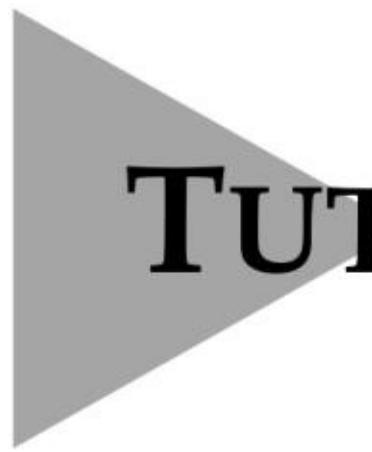




**xiv**    *The Little SAS Enterprise Guide Book*







# TUTORIALS

- A** Getting Started with
- B** Creating Reports 3
- C** Working with Data i
- D** Joining Two Data Ta







“ Dimid  
habet. ”

“ What's  
done. ”

— —

From *Epistolae*, I. 2. 40, 20 BC. A  
*Modern Foreign Languages* by Jeł



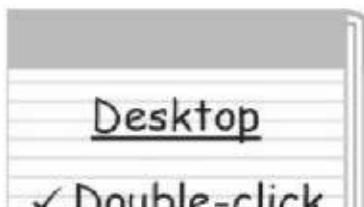
# A

# Getting Started with S

This first tutorial will give you an overview of SAS Enterprise Guide and how quickly tasks can be completed.

- Starting SAS Enterprise Guide
- A quick tour of SAS Enterprise Guide
- Data types
- Entering data into SAS Enterprise Guide
- Using SAS Enterprise Guide menus
- Making changes to your data

The data for this tutorial is a list of tours of volcanoes around the world. Each row contains the name of the volcano, the city from which it is located, the price of the tour, and the tour's difficulty rating: easy, medium, or hard.

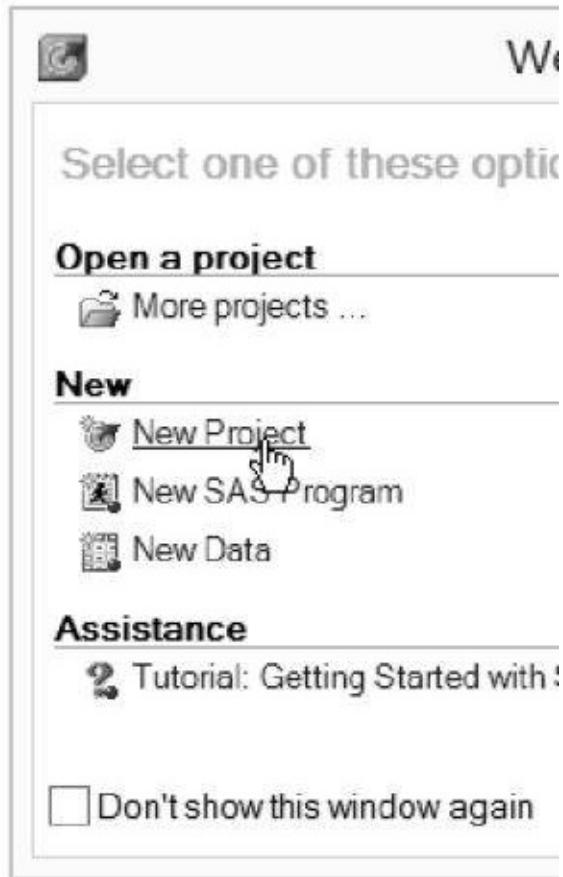


## Starting SAS Enterprise Guide

Start SAS Enterprise Guide by double-clicking the **SAS** icon on the desktop.



icon on your desktop, or **Enterprise Guide** from the menu. Starting SAS Enterprise Guide brings up the SAS Enterprise Guide window in the background. The Welcome window in the foreground allows you to switch between opening an existing project and starting a new project. Click





## **4** *The Little SAS Enterprise Guide Book*

**SAS Enterprise Gui  
window** When you first start SAS Enterprise Guide, your screen should look something like the following. There are several parts to the SAS Enterprise Guide window: some are visible, while others may be hidden or temporarily closed.





## Basic elements of SAS Studio

**Project Tree:** This window displays the structure of your project.

**Workspace:** This is a container for your analysis, including Data Grids, SAS code, and results.

**Process Flow:** This window shows the flow of data and processes in your analysis.



**Resources pane:** This pane contains links to the SAS Manager, or Data Explorer windows. It also lists servers that you can access, and any computer on which SAS is installed. The Available Tasks link lists all available tasks. The SAS Folders link lists all SAS folders and projects. The Prompt History provides links to previous command-line prompts.

To open a SAS window, click their icon in the Resources pane. To open a SAS Folders window, click the  icon for the Folders link.

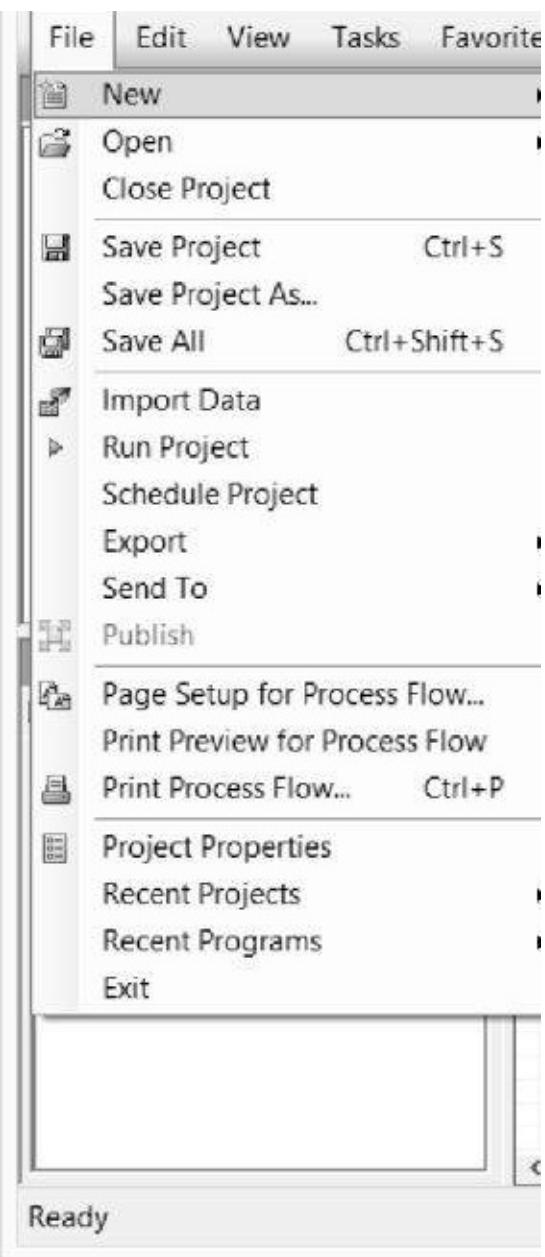
**Task Status (not shown)** To view the status of a task, click the Task Status link. To run a task, click the Run button. To cancel a task, click the Cancel button. To stop a task, click the Stop button. To refresh the Task Status list, click the Refresh button.

**Entering data** There are several ways to enter data into SAS Enterprise Guide. You can use the Data Editor window to enter data directly into SAS. You can also import data from Microsoft Excel files, and the data directly into SAS. To import data, select **File > New > Import**.



## Menu Bar

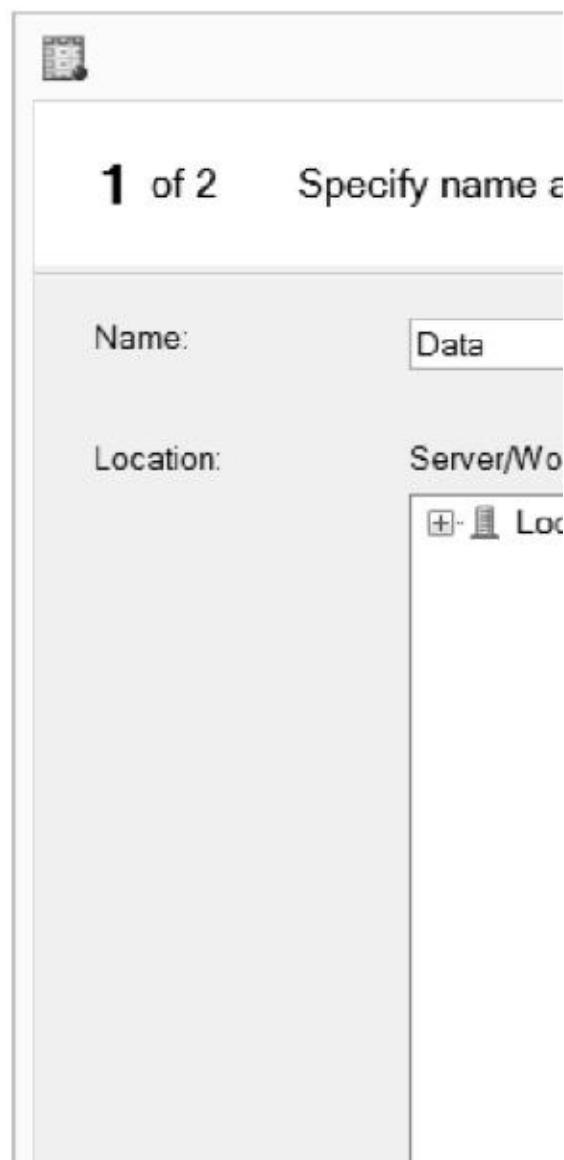
✓ Select  
File ► New ►  
Data





## **6**    *The Little SAS Enterprise Guide Book*

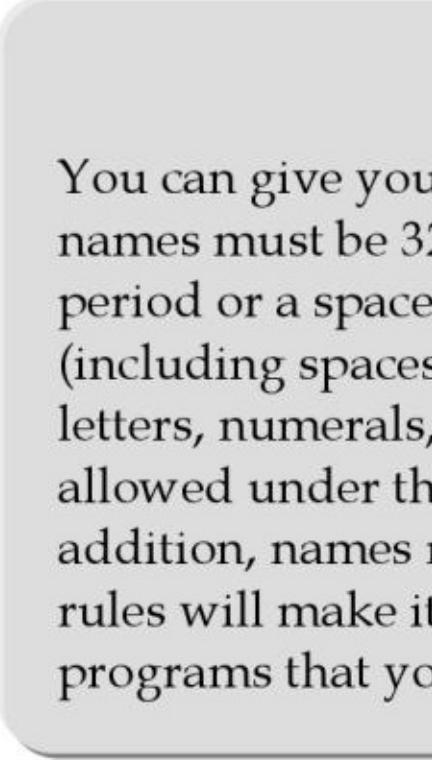
This opens the New Data Guide asks what you want to do.  
The name for the data table is:





## SA

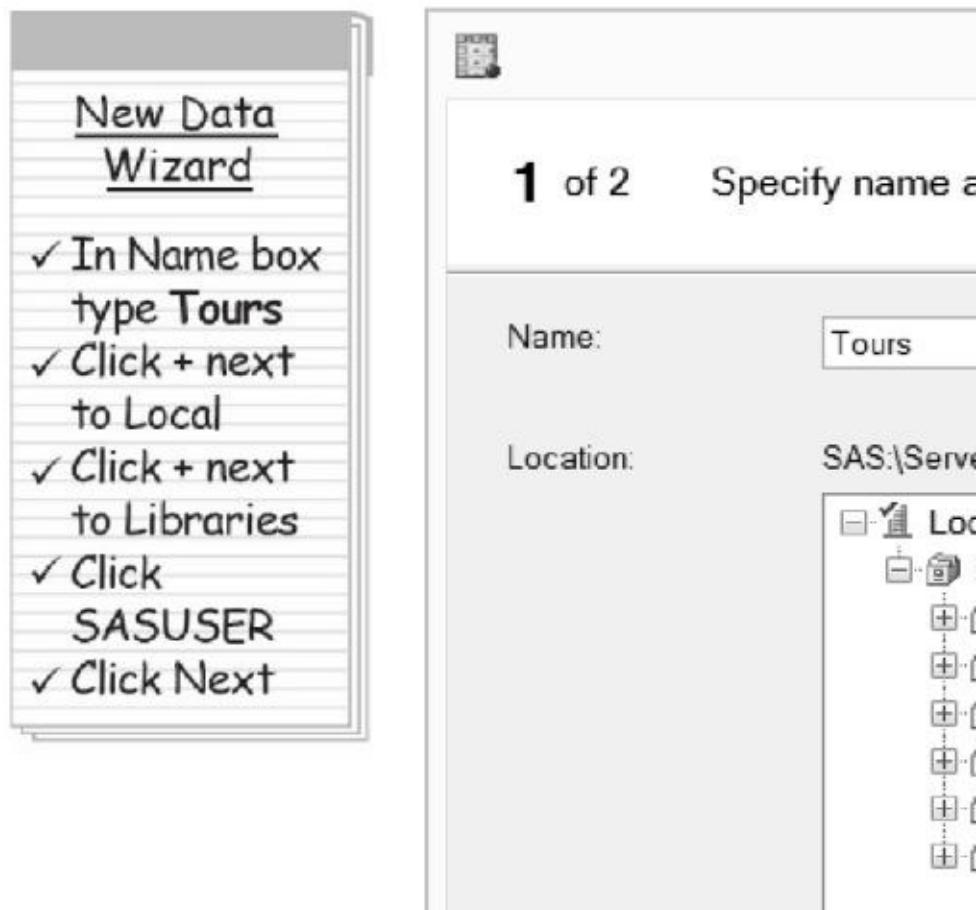
A SAS dat  
thing. The  
you will se



You can give your variables names. These names must be 32 characters or less. You can use a period or a space in your variable name (including spaces and periods). You can use letters, numerals, and underscores in your variable names. You cannot use punctuation marks other than a period or a space. In addition, names must begin with a letter. These rules will make it easier to write programs that you can understand.



Give the new data table to SAS libraries (storage location). Local and then Libraries. **SASUSER** to select the SAS library. Site may have set up the case for you, choose an alternative since that is a temporary.





Click **Next** to open the se

SAS Enterprise Guide stores data in libraries. Libraries are not stored. Instead of reading data from disk, SAS Enterprise Guide gets data from memory. The WORK library is automatically erased when you exit SAS Enterprise Guide. The SASUSER library is defined for you. Any data you create will be stored in the SASUSER library. If you define a new library, then data will be stored in that library. The Library wizard available in SAS Enterprise Guide makes it easy to define new libraries.

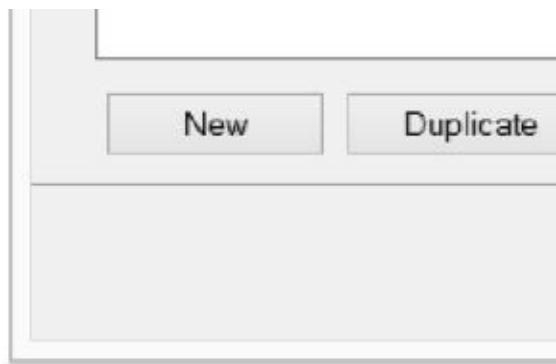


## 8 *The Little SAS Enterprise Guide Book*

The second window of the columns in your data columns with one-letter names and properties.

The screenshot shows a 'Create columns' dialog box. At the top, it says '2 of 2 Create columns'. Below that, there's a section labeled 'Columns:' containing a table. The table has two columns: 'Name' and 'Length (in bytes)'. There are six rows, each with a triangle icon and a letter from A to F. The row for 'A' is highlighted with a dark grey background.

Name	Length (in bytes)
A	12
B	12
C	12
D	12
E	12
F	12



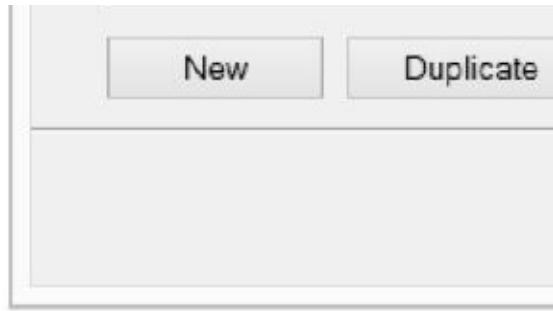
You can give  
want, but the  
length. While  
(including sp  
with just letter  
characters are  
naming rules  
must start wi  
will make it e  
in SAS progra



In the Column Properties  
length, display format, ar  
volcanoes, so type **Volca**

The image shows two overlapping windows. On the left is the 'New Data Wizard' window, which has a title bar 'New Data Wizard' and a list of steps: '✓ In Name box, type Volcano' and '✓ Press Enter'. On the right is a 'Column Properties' dialog box for a table with 2 columns. The title bar says '2 of 2 Create column:'. It shows a preview icon, the number of columns (2), and a 'Columns:' section. A table lists the columns with names A through F and a length of 12 bytes each.

Name	Length (in bytes)
A	12
B	12
C	12
D	12
E	12
F	12



When you press **Enter**, the case A, in the Columns by characters, as opposed to and because none of the to **12**.

The New Data will columns a length characters, you need as long as the longest than 12 characters shorter lengths for the data table.

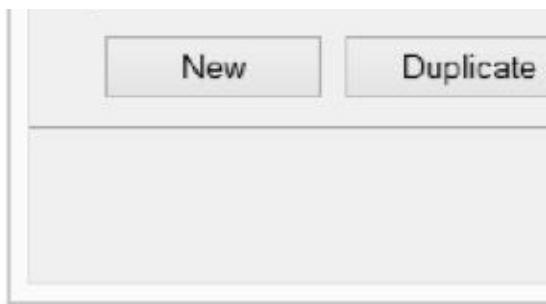


## 10 *The Little SAS Enterprise Guide Book*

Now click the column name in the name of the departure column in the **Column Properties** box.

The screenshot shows two windows side-by-side. On the left is the 'New Data Wizard' window, which has a title bar 'New Data Wizard' and a list of steps: 'Click Column B' and 'In Name box, type Departs'. On the right is a 'Create column' dialog box with a title bar '2 of 2 Create column'. It has a 'Columns:' section and a table:

Name	Length (in bytes)
Volcano	12
Departs	12
C	12
D	12
E	12
F	12





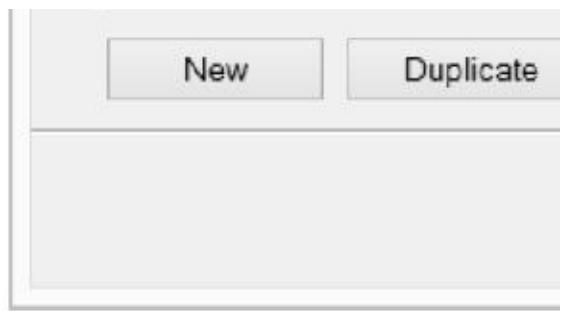
The third column contains because the values in this for the **Type** property.

The screenshot shows two windows side-by-side. On the left is the 'New Data Wizard' window, which has a title bar 'New Data Wizard' and a list of four steps:

- ✓ Click Column C
- ✓ In Name box, type Days
- ✓ From Type list, select Numeric

On the right is a 'Create columns' dialog box. It has a title bar '2 of 2 Create columns'. Below it is a 'Columns:' section with a table:

Name	Length (in bytes)
Volcano	12
Departs	12
<b>Days</b>	<b>12</b>
D	12
E	12
F	12



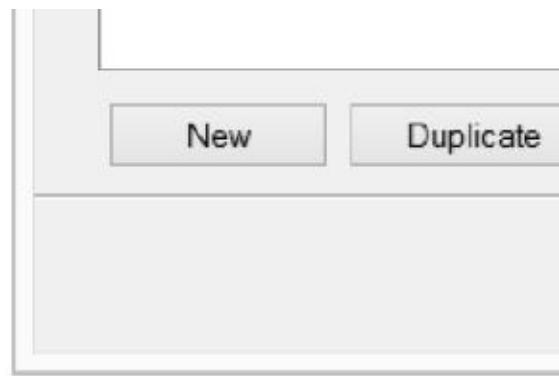


## 12    *The Little SAS Enterprise Guide Book*

Notice that when you set changes from the red pyr  
8 is the default for all nur  
maximum precision. Gen

The screenshot shows the 'Create columns' dialog box in SAS Enterprise Guide. At the top, it says '2 of 2 Create columns'. Below that, there's a section labeled 'Columns:' containing a table. The table has two columns: 'Name' and 'Length (in bytes)'. There are six rows in the table, each with a small icon to its left. The row for 'Days' is highlighted with a light gray background.

Name	Length (in bytes)
Volcano	12
Departs	12
Days	8
D	12
E	12
F	12



How do you  
or numeric  
or special c  
be character  
then it could  
Generally,  
the values,



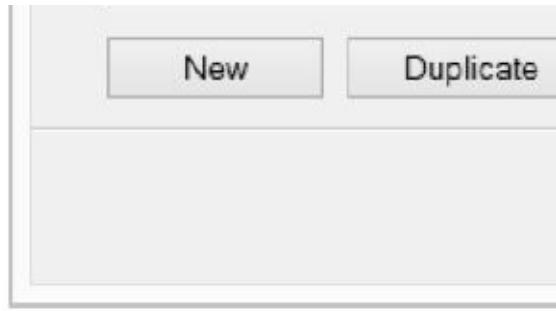
Name the fourth column numeric type, you have s  
Because Price will contain

The screenshot shows two windows side-by-side. On the left is the 'New Data Wizard' window, which has a title bar 'New Data Wizard' and a list of four steps:

- ✓ Click Column D
- ✓ In Name box, type Price
- ✓ From Type list, select Numeric
- ✓ From Group list, select Currency

On the right is a preview window titled '2 of 2 Create columns'. It shows a table structure with one row and six columns. The columns are labeled A through F. The 'Name' column lists the column names, and the 'Length (in bytes)' column lists their lengths. The 'Price' column is highlighted.

Columns:	
Name	Length (in bytes)
A Volcano	12
B Departs	12
C Days	8
<b>D Price</b>	<b>8</b>
E	12
F	12



By choosing a **group**, what you're doing is assigning a specific way of displaying currency, then in the Enterprise Guide, if you type \$1,200. SAS Enterprise Miner will assign some of



## 14    *The Little SAS Enterprise Guide Book*

Notice that when you do

The screenshot shows the 'Create column' dialog box from SAS Enterprise Guide. At the top, it displays '2 of 2' and 'Create column:'. Below this, there is a table titled 'Columns:' with two columns: 'Name' and 'Length (in bytes)'. The table contains six rows, each with a small icon to the left of the column values:

Name	Length (in bytes)
Volcano	12
Departs	12
Days	8
Price	8
E	12
F	12

At the bottom of the dialog box, there are two buttons: 'New' and 'Duplicate'.





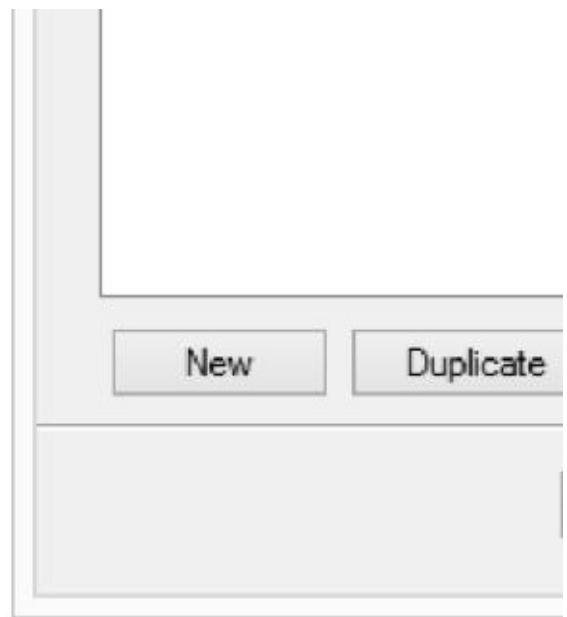
The final column will contain tours have values of c, the easiest tours have values of a, the hardest tours have values of d. The values for the column are currently set at length 12, but needs to be changed to 1.

The image shows two windows side-by-side. On the left is a window titled 'New Data Wizard' with a list of steps:

- ✓ Click Column E
- ✓ In Name box, type Difficulty
- ✓ In Length box, type 1
- ✓ Press Enter

On the right is a screenshot of a 'Create column' dialog box. It shows a table with columns 'Name' and 'Length'. The table contains the following data:

Name	Length
Volcano	
Departs	
Days	
Price	
Difficulty	
F	



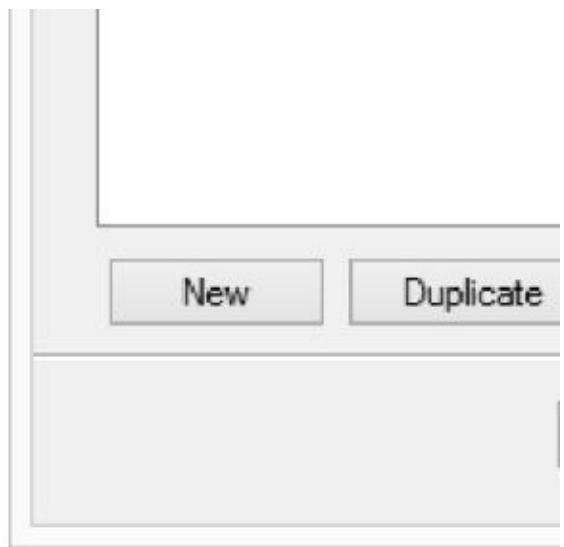


## 16    *The Little SAS Enterprise Guide Book*

Now the properties for all column F. Delete the unnecessary clicking the delete button

The image shows two windows side-by-side. On the left is the 'New Data Wizard' window, which has a title bar 'New Data Wizard' and two bullet points: '✓ Click Column F' and '✓ Click Delete button'. On the right is a 'Create column' dialog window, which has a title bar '2 of 2 Create column' and a table titled 'Columns'. The table has two columns: 'Name' and 'Length'. It lists six columns: Volcano, Departs, Days, Price, Difficulty, and F. The row for column F is highlighted with a dark grey background.

Name	Length
Volcano	
Departs	
Days	
Price	
Difficulty	
F	

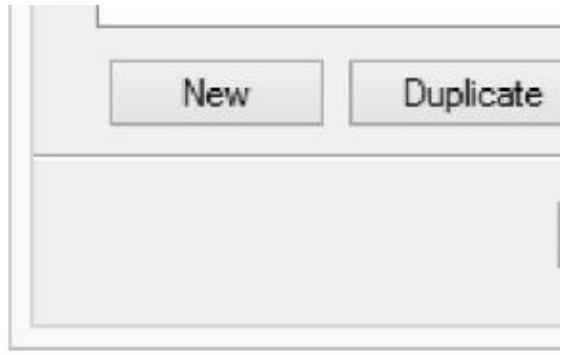




Now all the columns have columns.

The screenshot shows the 'New Data Wizard' interface. On the left, a sidebar displays the title 'New Data Wizard' and a 'Click Finish' button. The main area is titled '2 of 2 Create column'. It lists five columns with their names and icons:

Name	Length
Volcano	100px
Departs	100px
Days	100px
Price	100px
Difficulty	100px



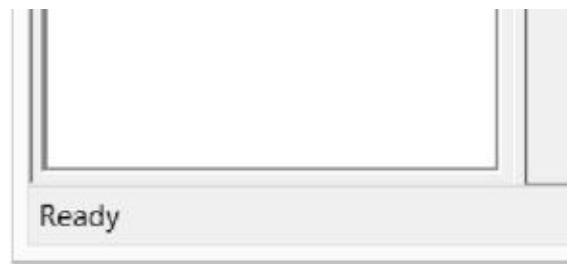
Click **Finish** to create the workspace with all the Tours data table in the Project.



## 18 *The Little SAS Enterprise Guide Book*

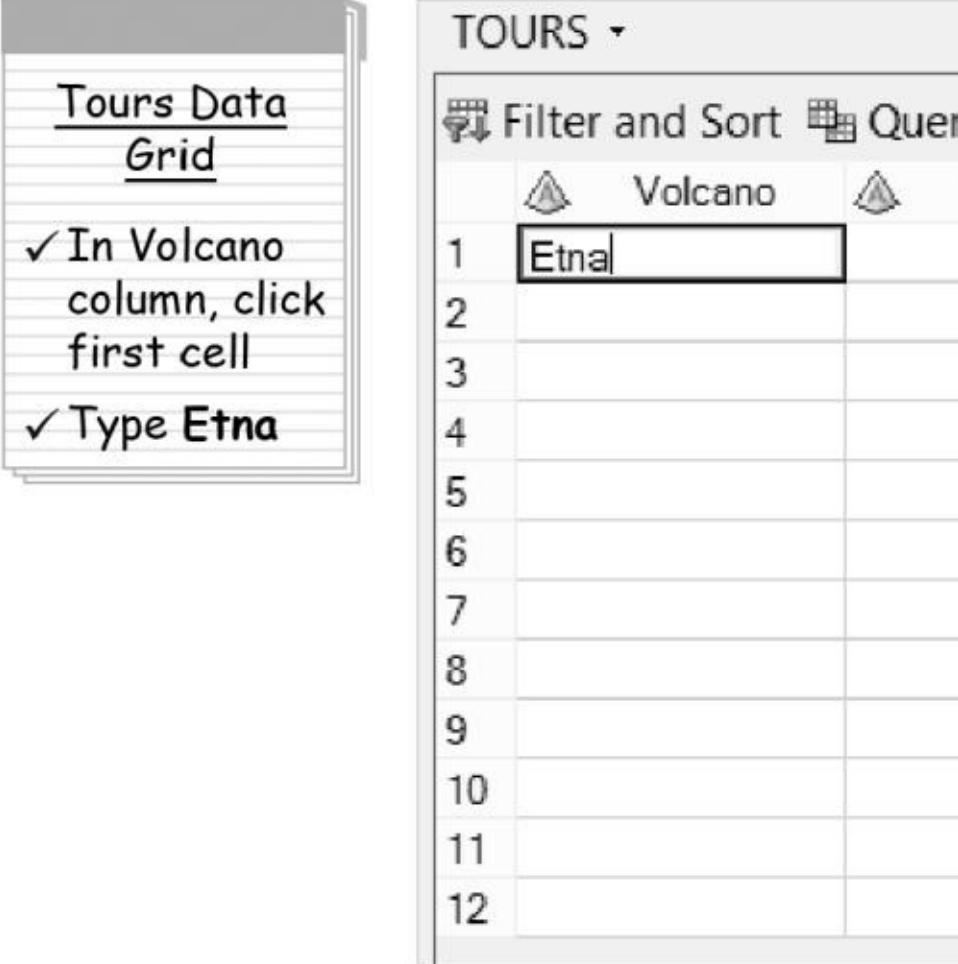
Notice that the numeric c  
because in SAS Enterpris  
period, whereas missing  
been entered into the Dat







You can now start entering data. Simply click a cell and start typing. You can also click the column and type the value.



TOURS	
	Filter and Sort
1	Volcano
2	Etna
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

- Tours Data Grid
- ✓ In Volcano column, click first cell
  - ✓ Type Etna

To move over to the next cell, press the **Enter** key. You can also use the arrow keys to move between cells.

you can simply click the column headers to sort the tours so that your Data Grid displays them in ascending order. If you click the column header for the Price column, you will see the numerals that make up the tour prices sorted from lowest to highest. Enterprise Guide will give you a visual cue.

The image shows two windows from the SAS Enterprise Guide interface. On the left, a 'Tours Data Grid' window displays a table with two columns: 'Volcano' and 'Location'. The data includes Etna, Catan, Fuji, Tokyo, Kenya, Nairobi, Kilauea, Hilo, Kilmanjaro, Nairobi, Krakatau, Jakarta, Poas, San Jose, Reventador, Quito, St. Helens, Portland, Vesuvius, Rome, and two empty rows for entries 11 and 12. A note in the grid says '✓ Enter data into columns'. On the right, a 'TOURS' window shows a 'Filter and Sort' interface with dropdown menus for 'Filter' and 'Sort'.

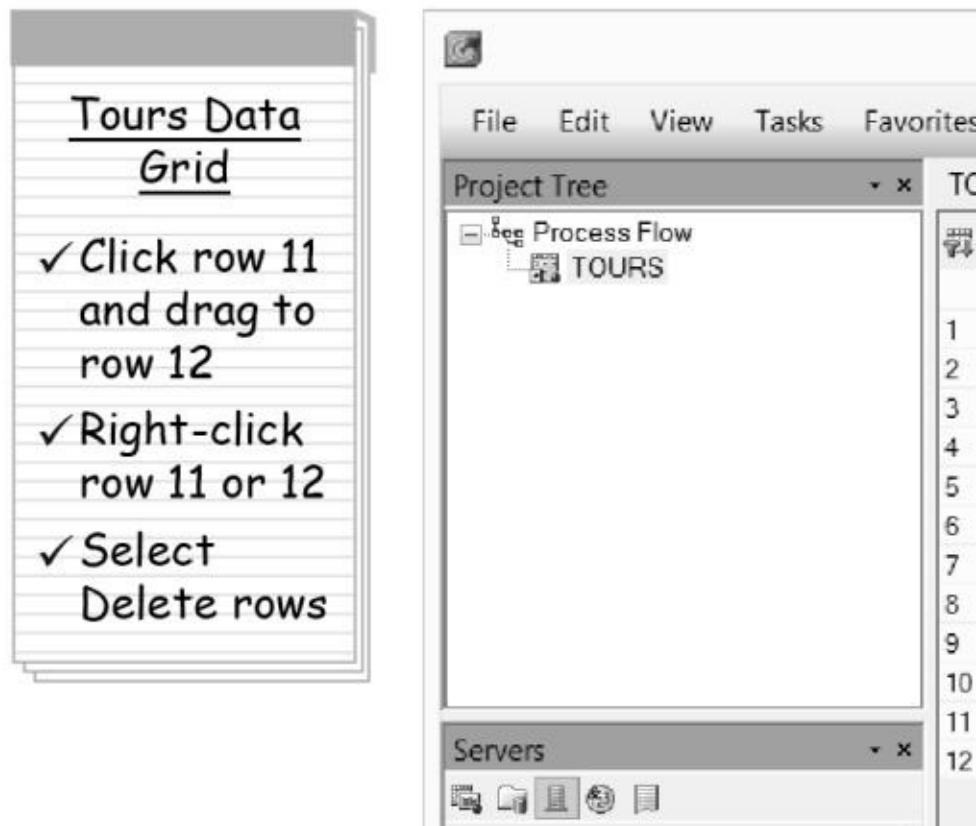
	Volcano	Location
1	Etna	Catan
2	Fuji	Tokyo
3	Kenya	Nairobi
4	Kilauea	Hilo
5	Kilmanjaro	Nairobi
6	Krakatau	Jakarta
7	Poas	San Jose
8	Reventador	Quito
9	St. Helens	Portland
10	Vesuvius	Rome
11		
12		

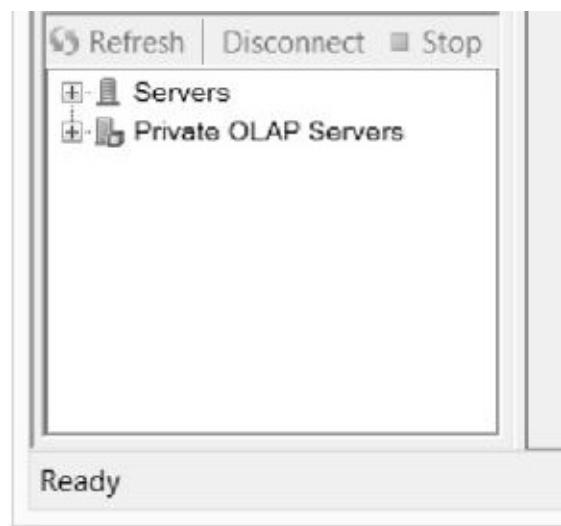
If you need to go back and change a value, just click on the cell and enter a new value.



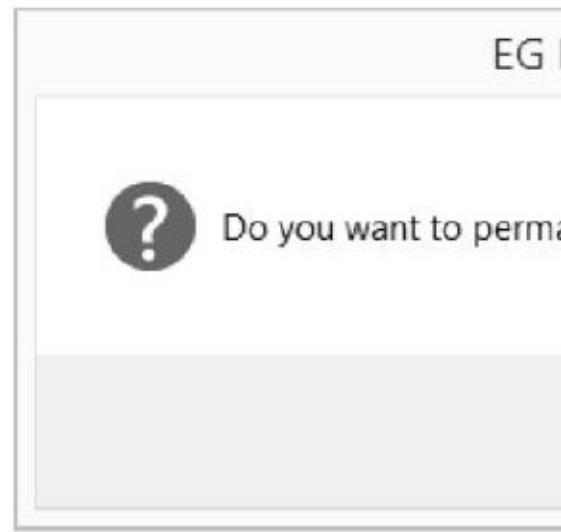
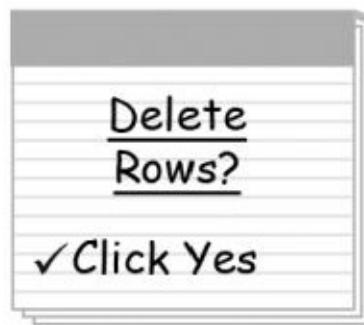
## 20    *The Little SAS Enterprise Guide Book*

By default, SAS Enterprise Guide displays 12 rows of data, then you can change this. If you have only 10 tours in this data set, then don't delete the blank row. Instead, missing values will appear in the blank rows by clicking **Rows**, selecting the rows and select **Delete**.



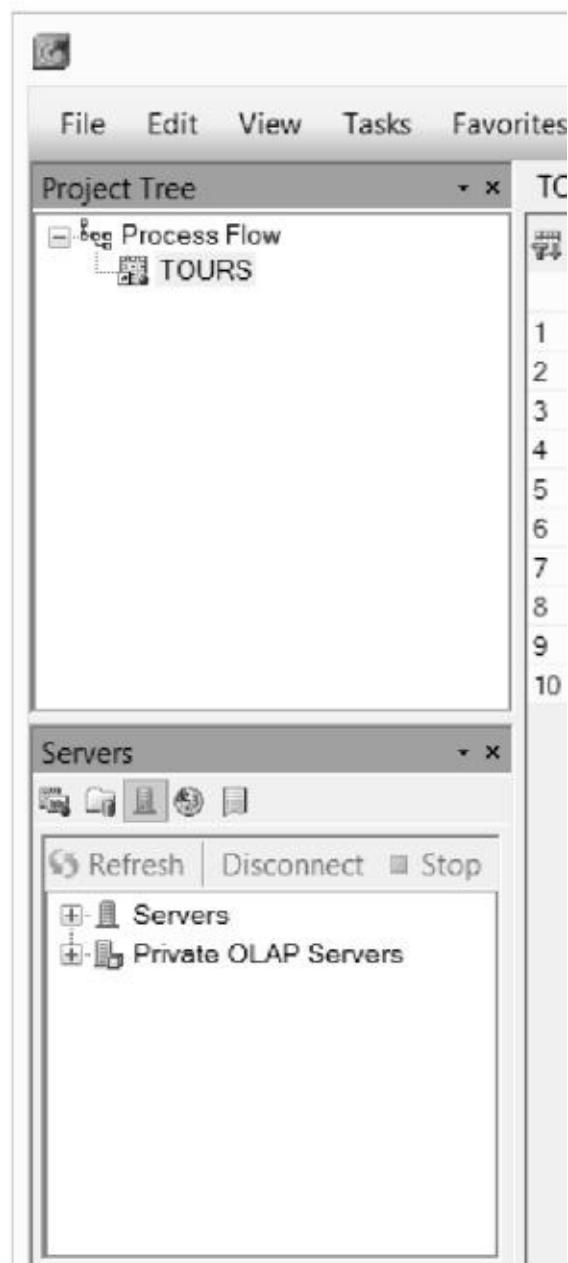


Confirm that you want to





Now the Data Grid is cor



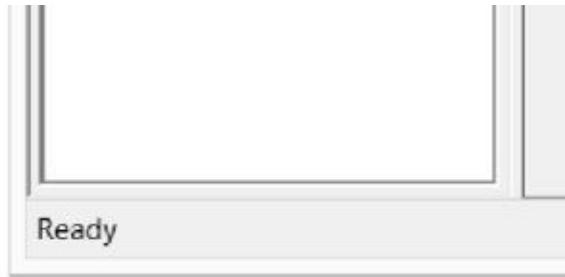
Ready



## **Creating a frequency**

the number of easy, mod  
Select **Describe ► One-W**  
the data.



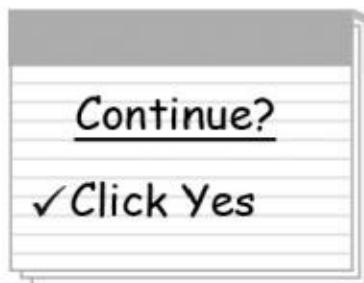


You can open the toolbar of a Task List window comfortably by clicking tasks using

Some tasks in the window. A task at a time are Not all tasks will be listed

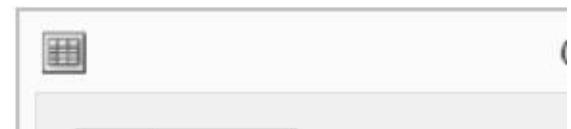


Because the data have just  
appears.



Data must be protected b  
data ensures that the data  
protected, SAS Enterprise

This opens the One-Way  
Plots, Results, Titles, and  
displayed. All six pages f  
displayed page highlight



**Data**

Statistics  
Plots  
Results  
Titles  
Properties

**Data**

Data source: Local  
Task filter: None

**Variables to assign**

Name  
Volcano  
Departs  
Days  
Price  
Difficulty

The selection pane

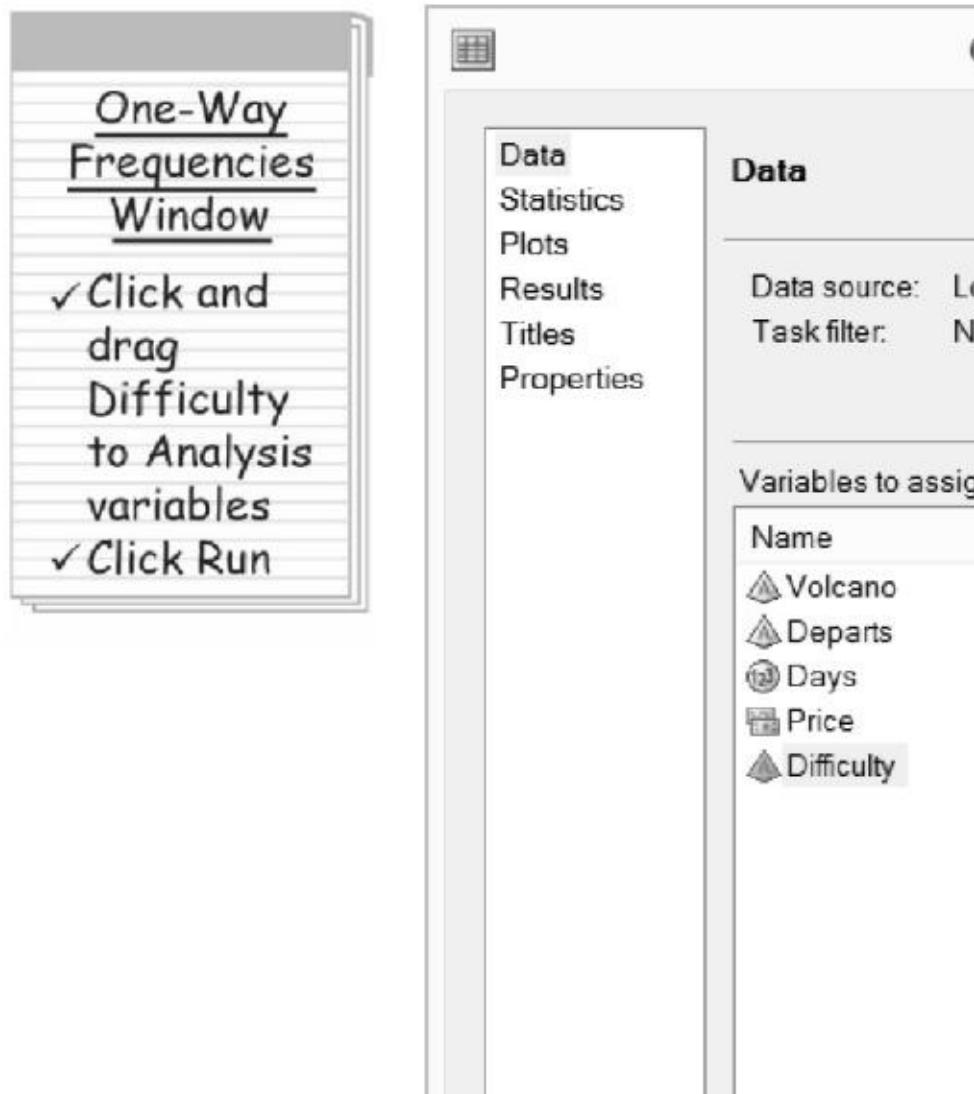
Preview code

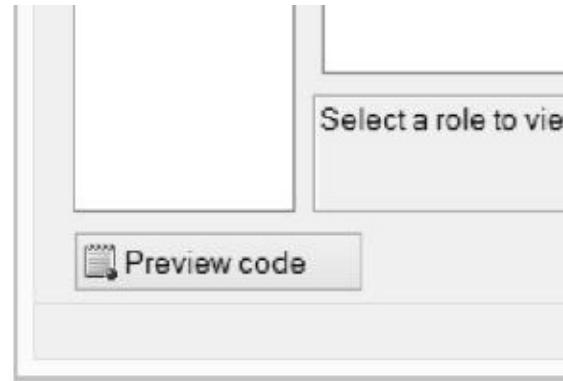
The "Analysis variables" role must have a value



## 24    *The Little SAS Enterprise Guide Book*

For most tasks that you perform, you can assign variables to roles. To promote the variable Difficulty, click the role.



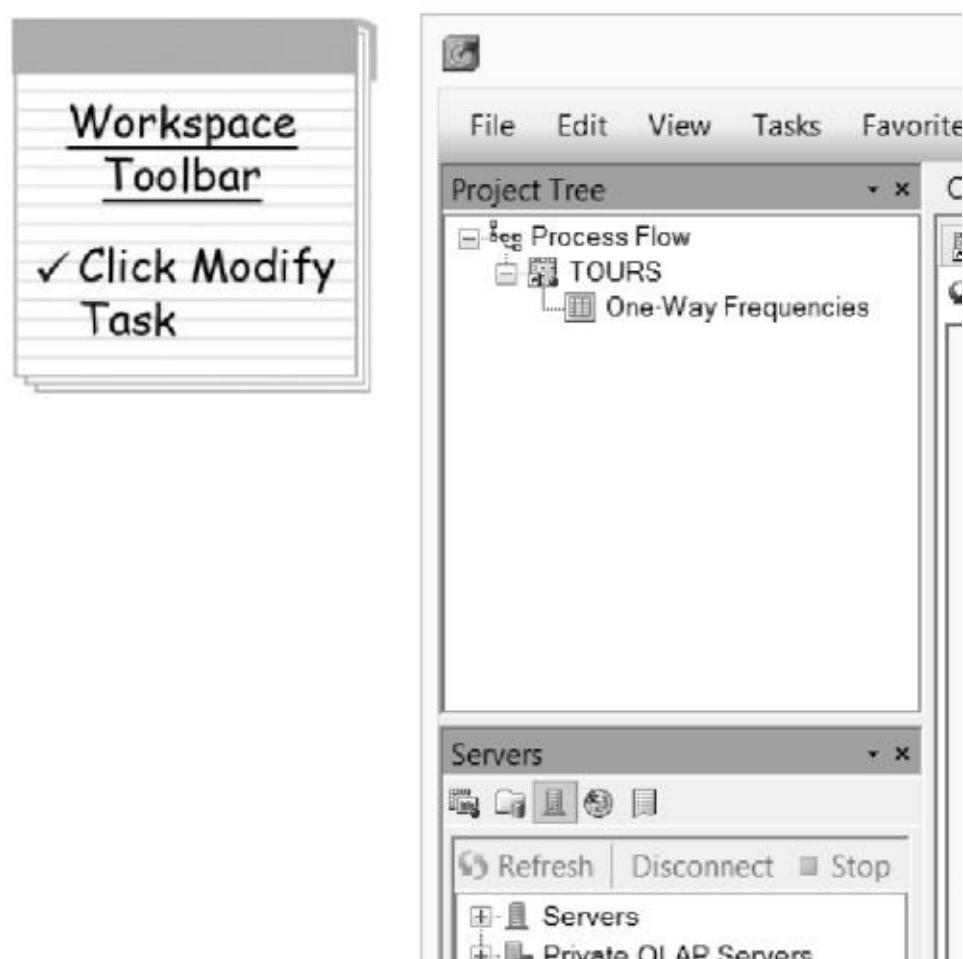


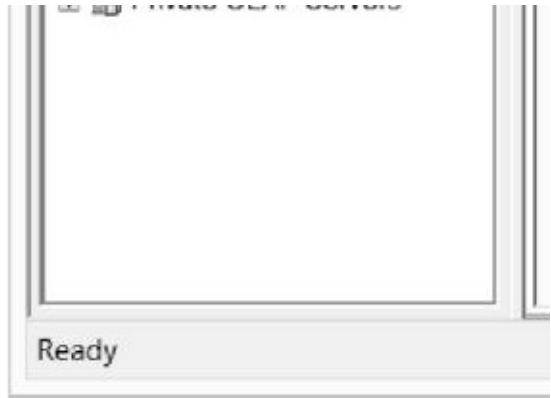
Click **Run** to run the task

A  
The  
you  
Ent  
Free  
whi  
“co  
colu



The results from the task Results tab, the task has a Input Data tab contains the generated by the task, and produced while running easy, and three are mode





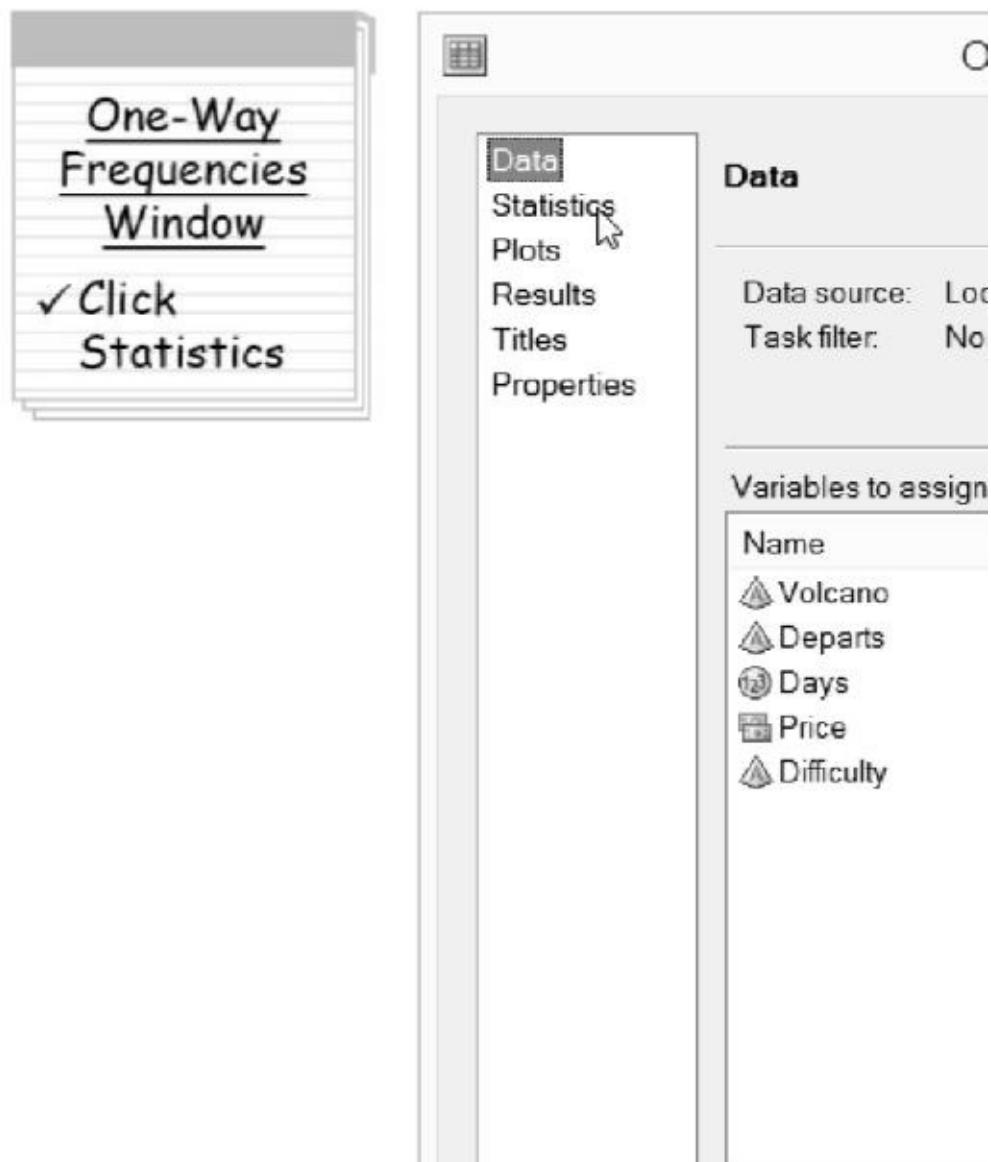
To make changes to the taskbar, click the Taskbar button on the toolbar to reopen the taskbar.

The workspace contains many features, particularly the **Modify** feature, which you are



## 26    *The Little SAS Enterprise Guide Book*

Notice that when you rec  
example, we are going to  
**Statistics** in the selection

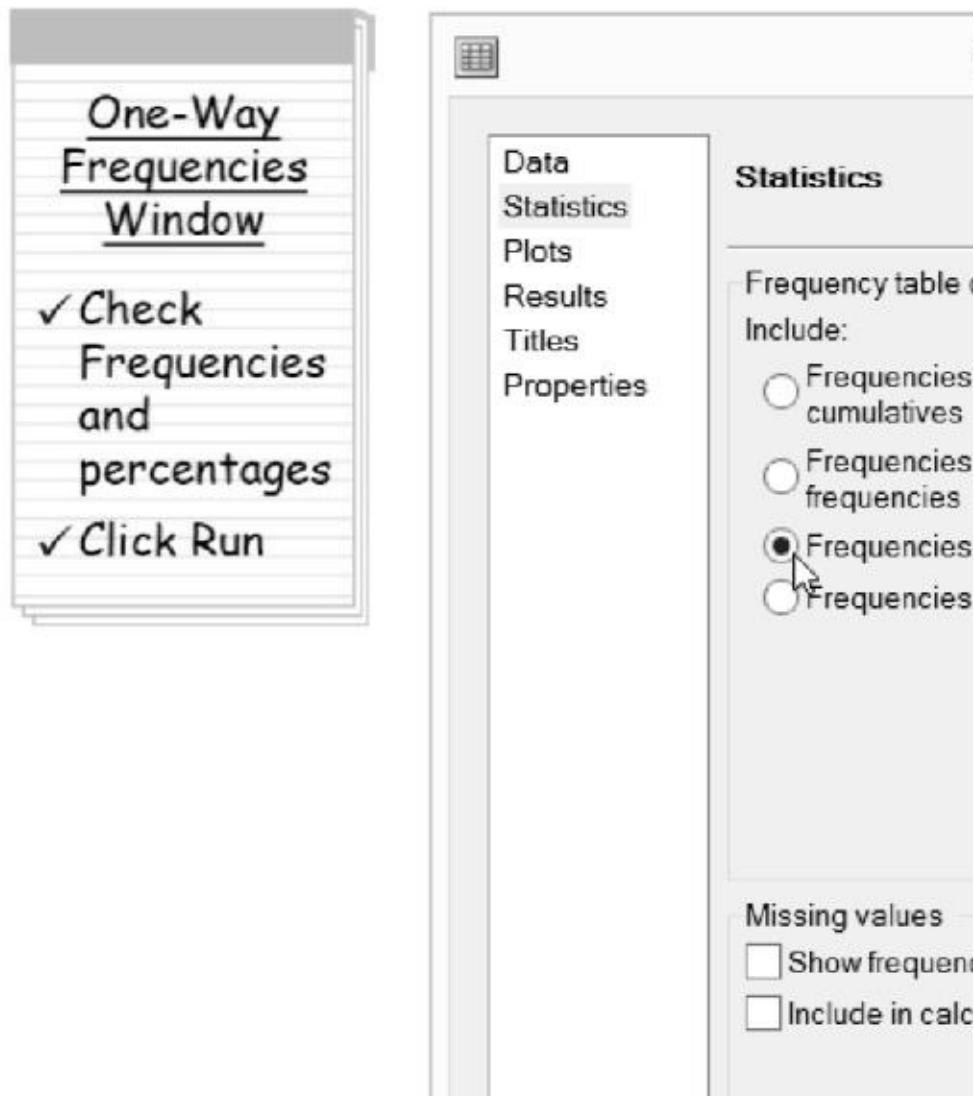


The selection pane

Preview code

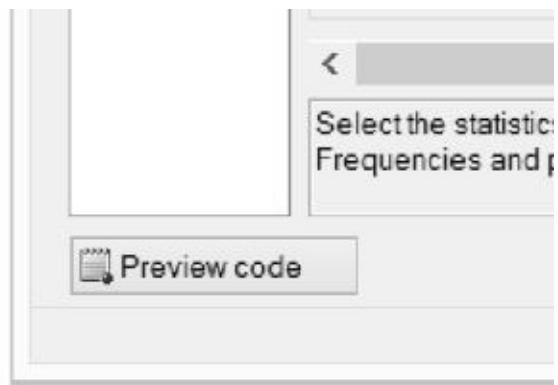


There are many options in this dialog box. You can choose which frequencies, percentages, and cumulatives you want to include in the table. To exclude them, simply uncheck the corresponding boxes.

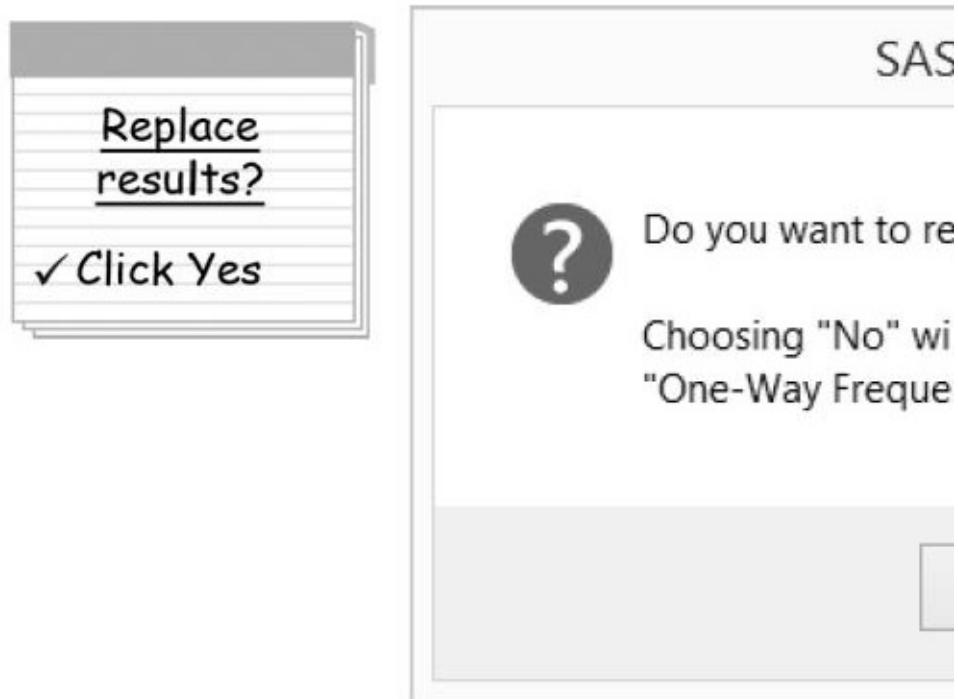


### One-Way Frequencies Window

- ✓ Check Frequencies and percentages
- ✓ Click Run



Rerun the task by clicking the green arrow icon in SAS Enterprise Guide given in the previous step. This will generate the last time you ran the task.



In this case, there is no replacement of results.

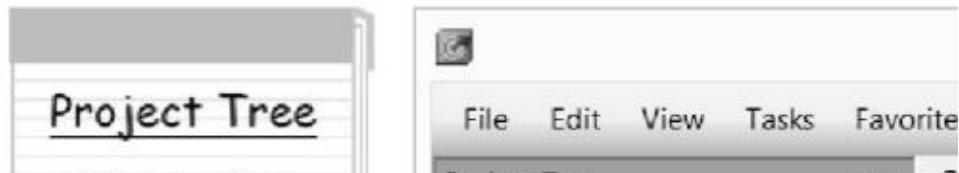


## **28**    *The Little SAS Enterprise Guide Book*

Here are the results that you get when you run the program without the percentages without the colon.

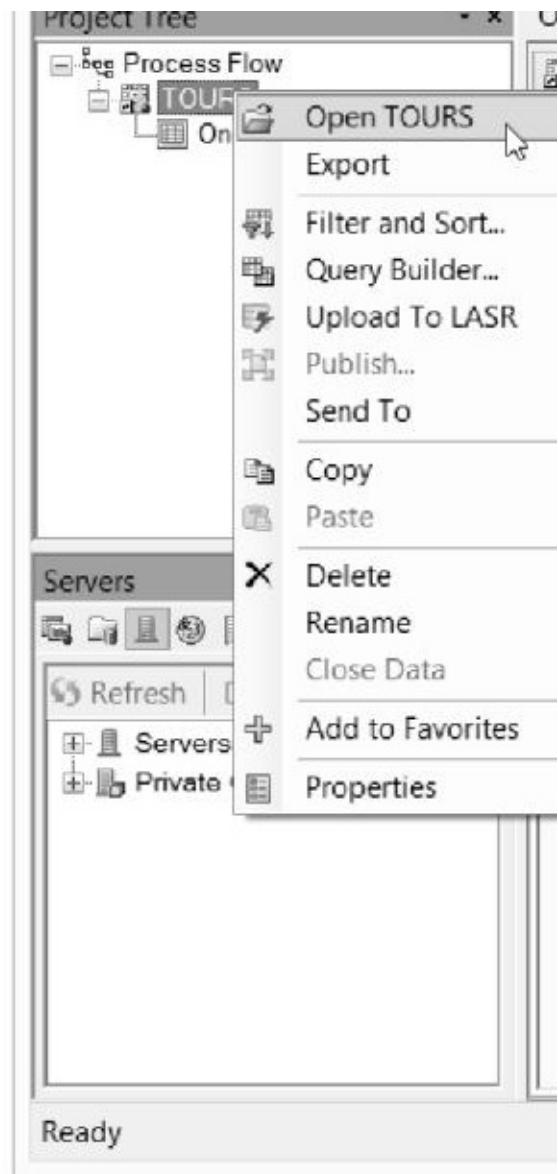
Generated by the SAS System

**Creating a scatter plot**  
This is a different task. First reope the data table icon in the Project Tree.



✓ Right-click  
TOURS icon

✓ Select Open  
TOURS





With the Tours data table  
items that apply to data. !





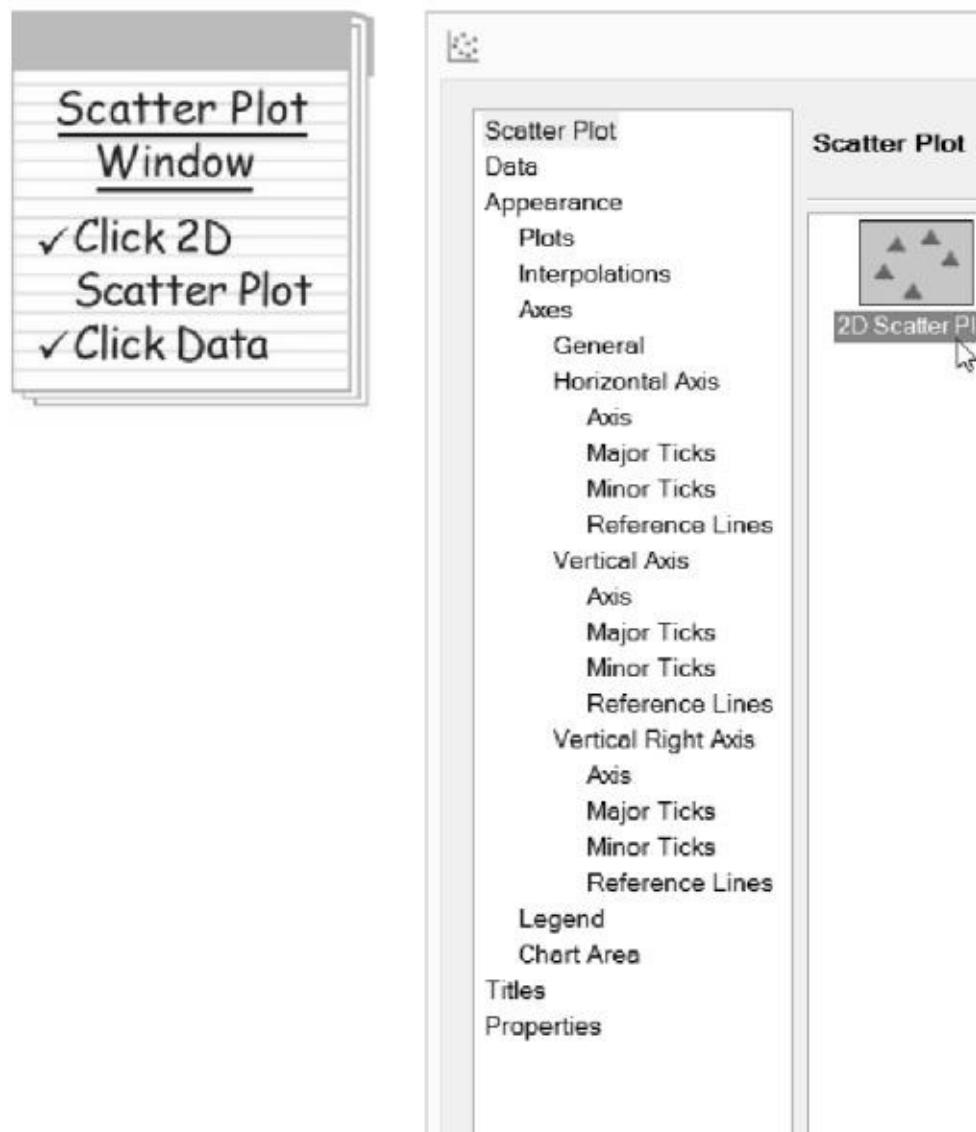
O

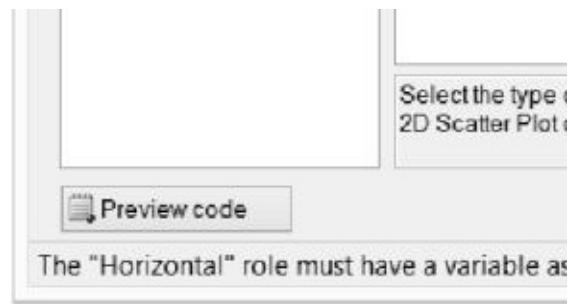
There are several ways to run tasks in Process Flow. You can right-click a task icon and select "Run Task" from the context menu. You can also click the table icon in the toolbar to open the Task List, where you can run a task by clicking its name. Another way is to click the task icon in the workspace.



## 30    *The Little SAS Enterprise Guide Book*

This opens the Scatter Plot Window. To change the type of scatter plot to something other than the default for this report, so click **2D Scatter Plot**.





Next, click **Data** in the sidebar.



For this plot, the column should be on the vertical  
click **Price** and drag it to

The image shows a 'Scatter Plot Window' on the left and its corresponding configuration dialog on the right.

**Scatter Plot Window:**

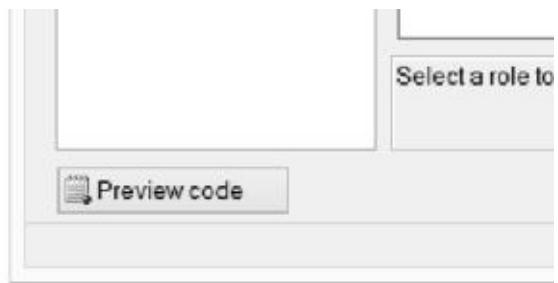
- Scatter Plot Window**
- ✓ Click and drag Days to Horizontal role
- ✓ Click and drag Price to Vertical role
- ✓ Click Run

**Configuration Dialog (Data tab):**

- Data source: (empty)
- Task filter: (empty)
- Columns to as:
  - Name
  - Volcano
  - Departs
  - Days
  - Price **(highlighted)**
  - Difficulty

The 'Data' tab also contains a tree view of plot settings:

- Scatter Plot
- Data
- Appearance
  - Plots
  - Interpolations
  - Axes
    - General
    - Horizontal Axis
      - Axis
      - Major Ticks
      - Minor Ticks
      - Reference Lines
    - Vertical Axis
      - Axis
      - Major Ticks
      - Minor Ticks
      - Reference Lines
    - Vertical Right Axis
      - Axis
      - Major Ticks
      - Minor Ticks
      - Reference Lines
  - Legend
  - Chart Area
  - Titles
  - Properties

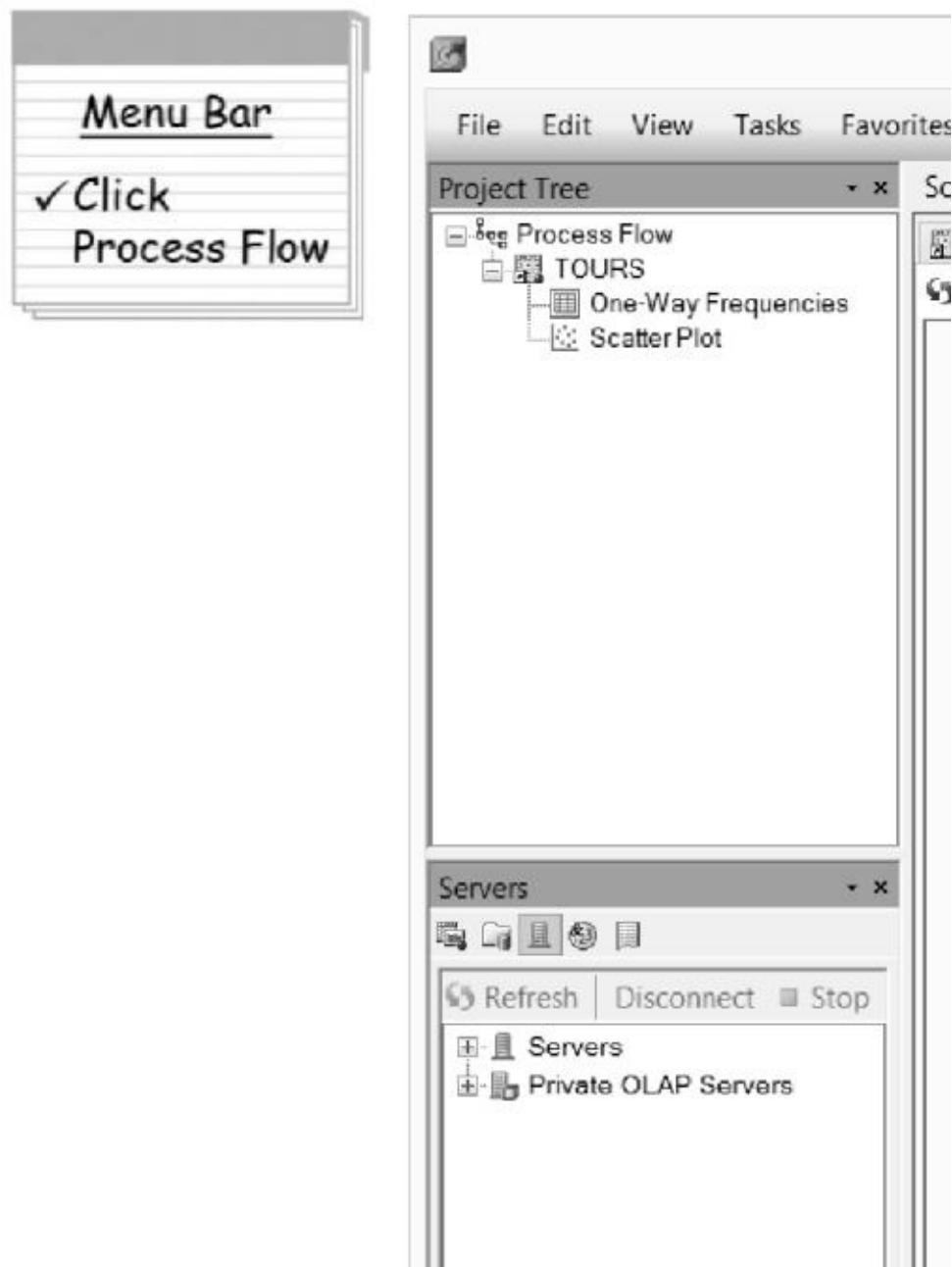


The Scatter Plot task has  
need to change anything



## **32**    *The Little SAS Enterprise Guide Book*

Here are the results of the





Now click **Process Flow**

There are  
the work  
drop-down  
in the Pr  
it from t  
but below



Both the Project Tree and how they are related. In t from the Tours data table for the Scatter Plot task. I see how the different par

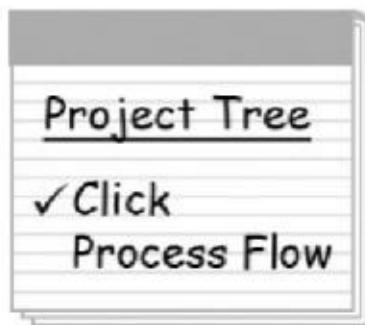




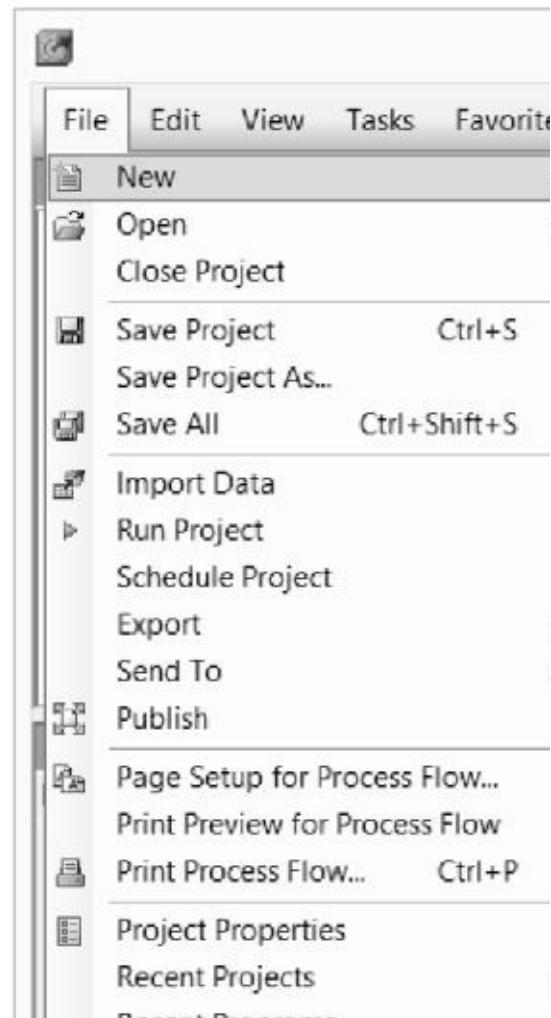
An alternate view of your workspace displays the same element tree diagram. The Project workspace, it sometimes



## 34 *The Little SAS Enterprise Guide Book*



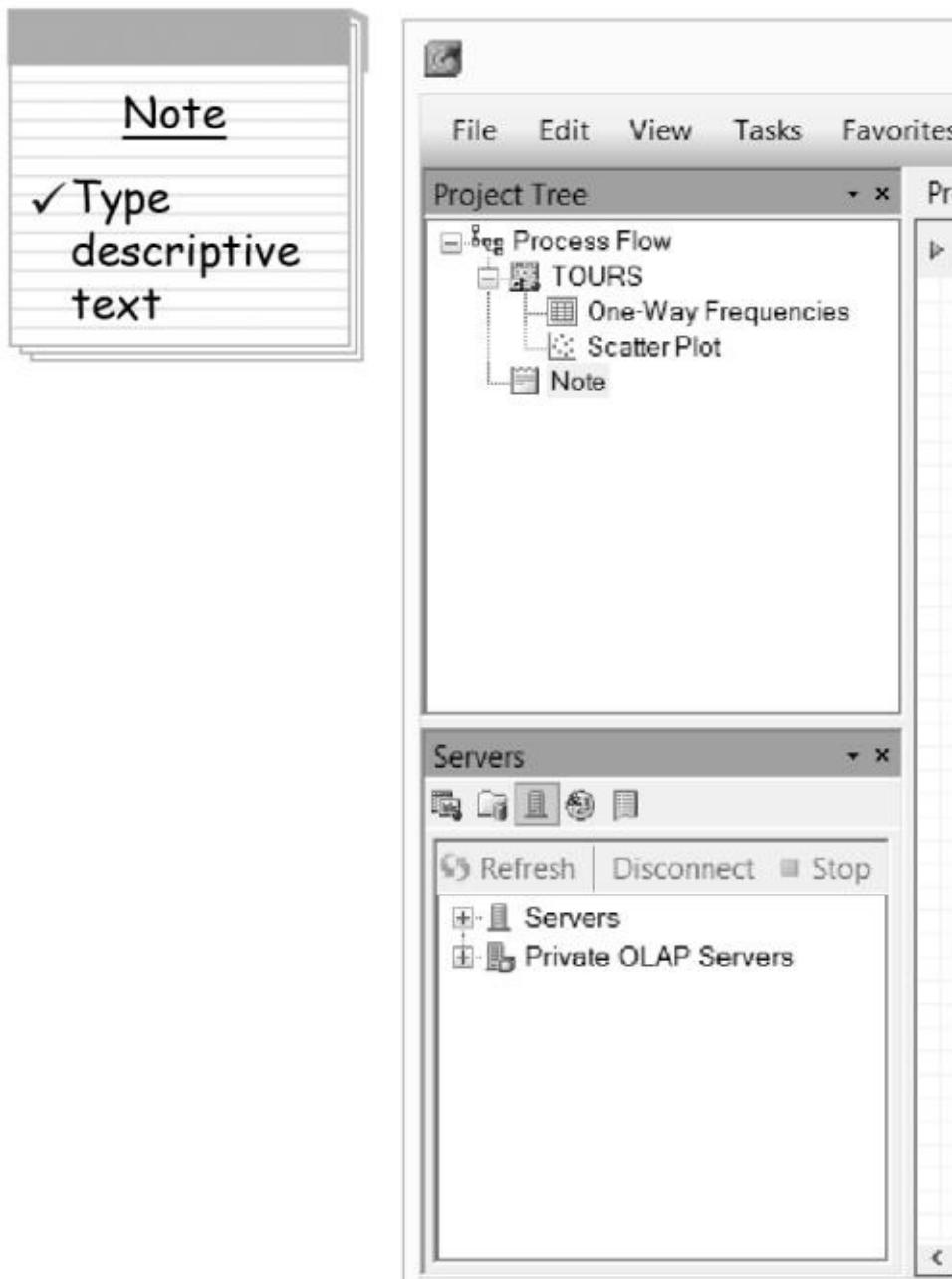
**Adding a note to the Project Tree or Menu Bar**  
can add notes to your project tree or menu bar. Instead of using the words **Process Flow** in the notes, you can use the words **Process Flow** instead of **Flowchart**.







Enter a brief description of the note.

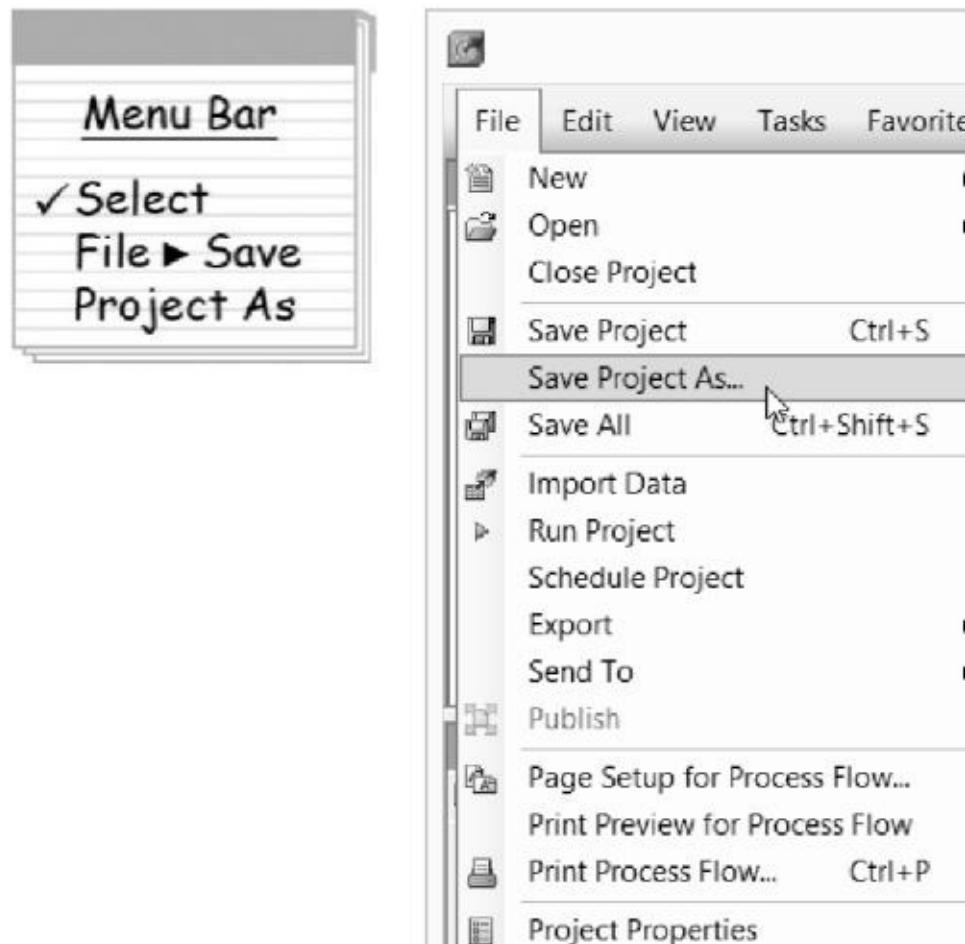


Ready

You can collapse the note box, or you can enlarge it and selecting **Open** from in the Process Flow.



**Saving the project** SAS changes before allowing you to exit. All the tasks created in the project are saved in the project. The data files are saved in the project from the menu bar.



Recent Projects

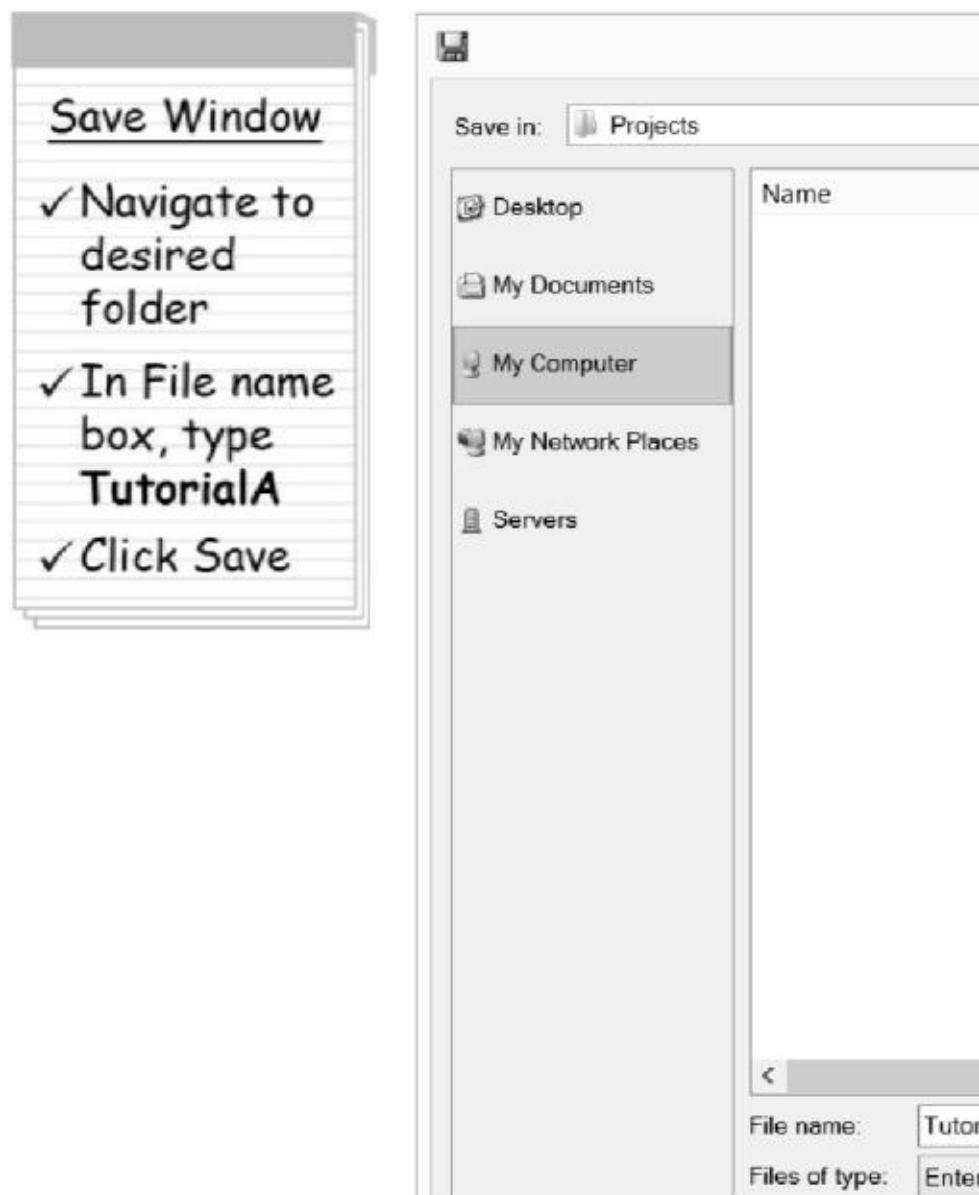
Recent Programs

Exit

Ready



Navigate to the location where you want to save the file  
**TutorialA** and click **Save**



### Save Window

- ✓ Navigate to desired folder
- ✓ In File name box, type **TutorialA**
- ✓ Click Save



Now you can exit SAS Enterprise Guide. On the menu bar, select **File** | **Exit** to exit the tutorial.





“ The ok  
is never se  
expresses

From *Sand and Foam: A Book of Poems*





## B

# Creating Reports

In this tutorial, you will learn how to use some of the options in the List menu. You will learn ways of formatting output from this tutorial:

- Creating list reports
- Titles, footnotes, and subtitles
- Display formats
- User-defined formats
- Styles
- Result types

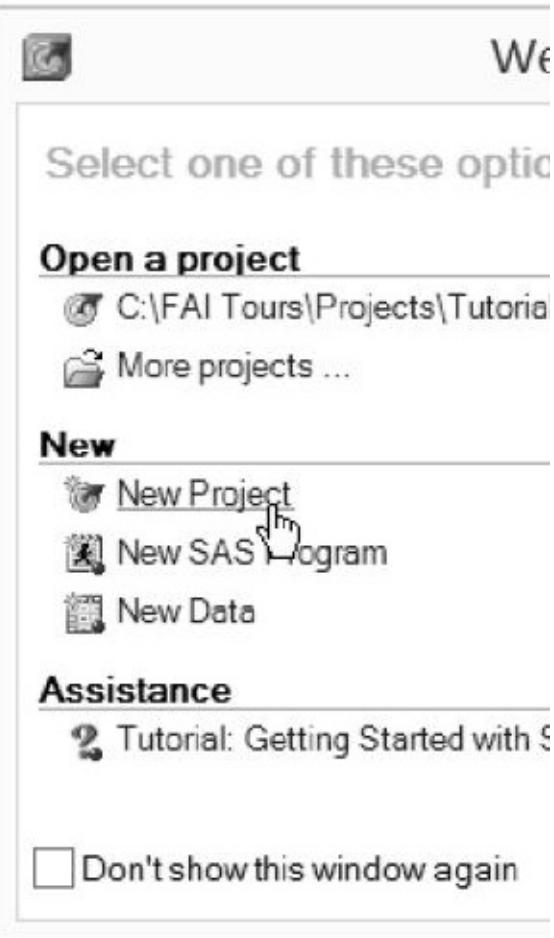
**Before beginning this tutorial**  
This tutorial contains information about how to use the SAS Enterprise Guide interface. The Tours data table is created for this tutorial. See Appendix A for the details.



**Starting SAS Enterprise Guide**  
To start SAS Enterprise Guide, click on the **SAS Enterprise Guide** icon on the desktop or click

✓ Double-click  
SAS  
Enterprise  
Guide icon

Guide from the Windows Enterprise Guide window foreground. The Welcome project or starting a new j

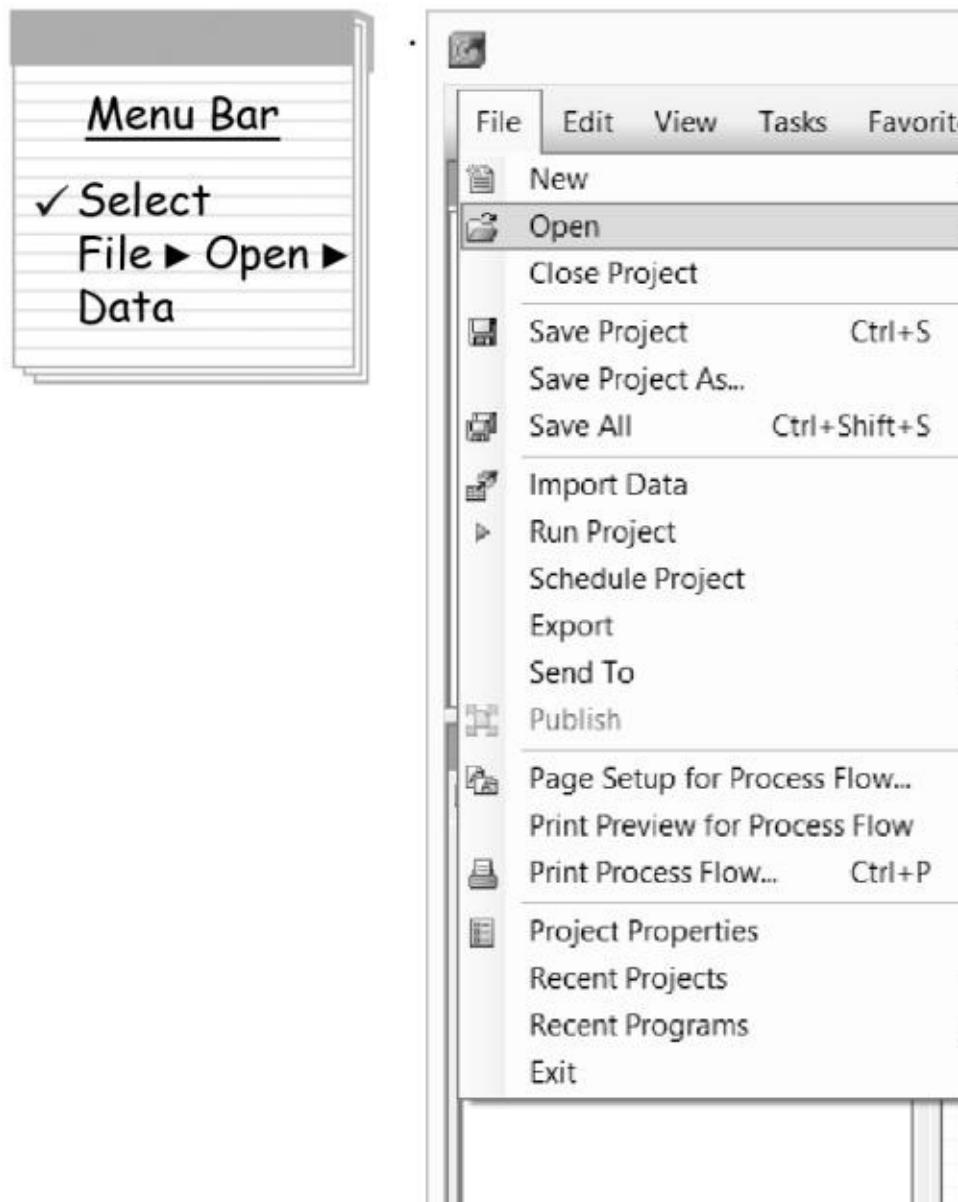




## 40    *The Little SAS Enterprise Guide Book*

### Opening the Tours

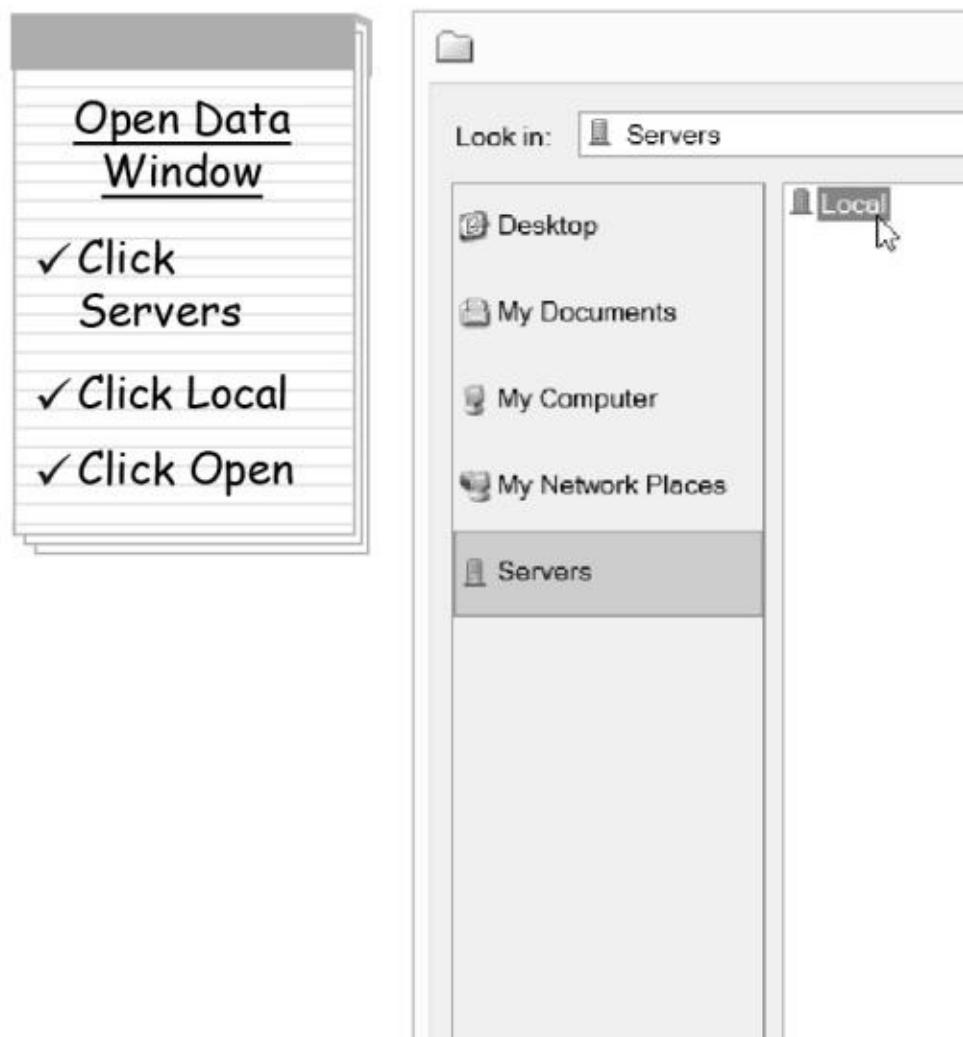
selecting File ► Open ► Data







This opens the Open Data window, which allows you to search for data from several locations. The easiest way to do this is to click the Local button in the Servers view, so click **Servers** and then click **Local** to see which servers are available.



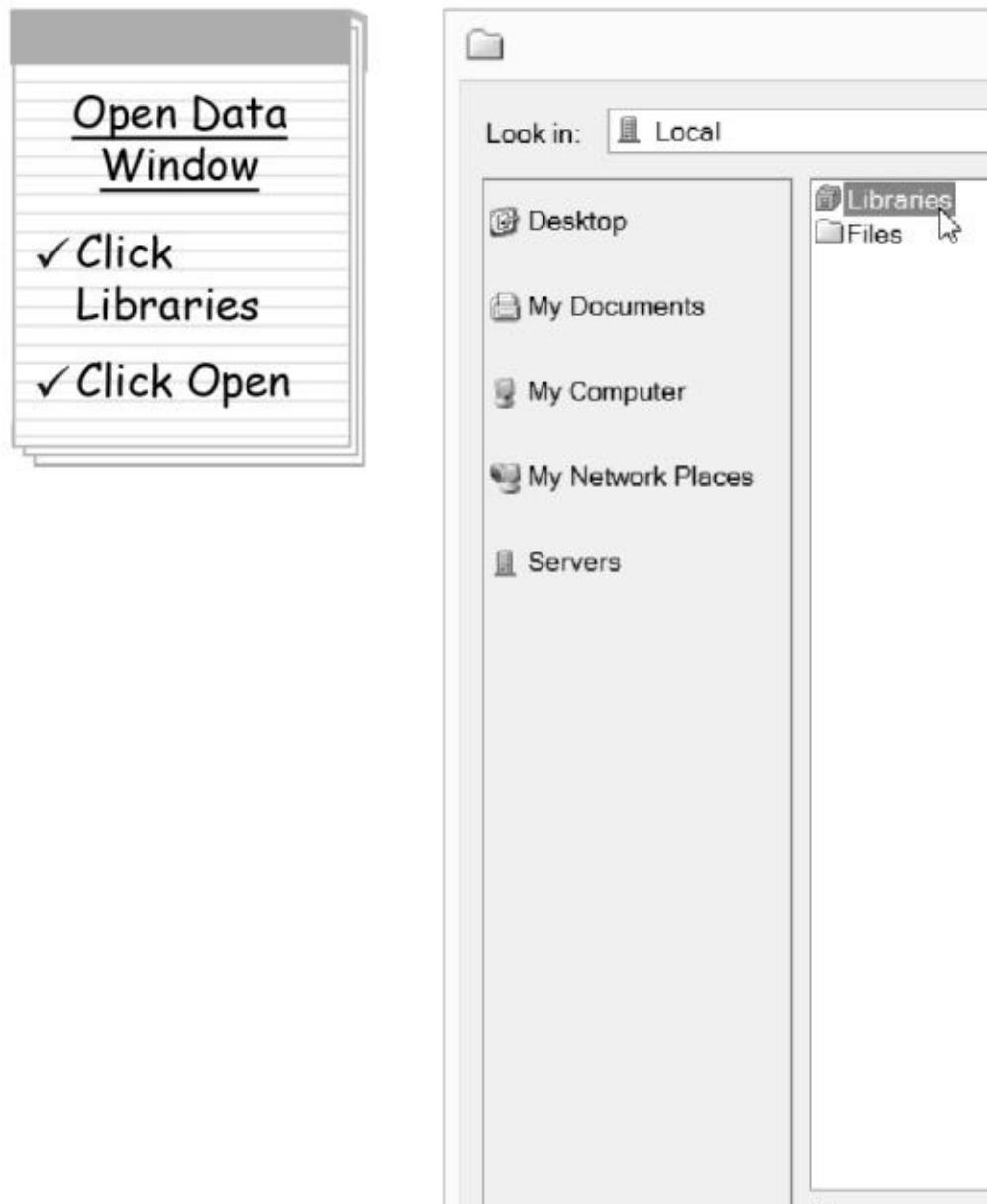


Then click **Local** to select  
choose the appropriate se



## 42    *The Little SAS Enterprise Guide Book*

Click **Libraries**, then click computer.

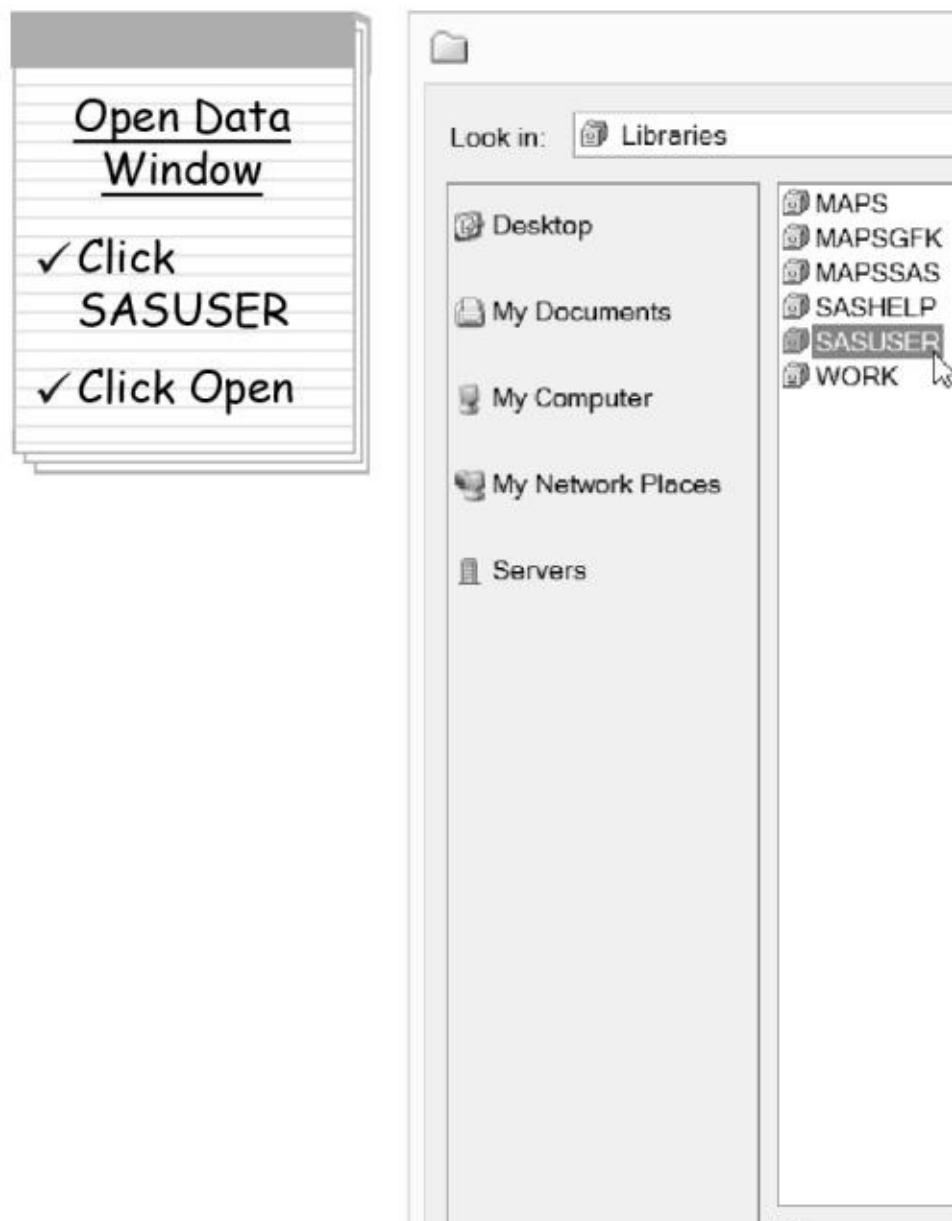


File name:

Files of type:



There are six libraries defined:  
SASUSER, and WORK. Y



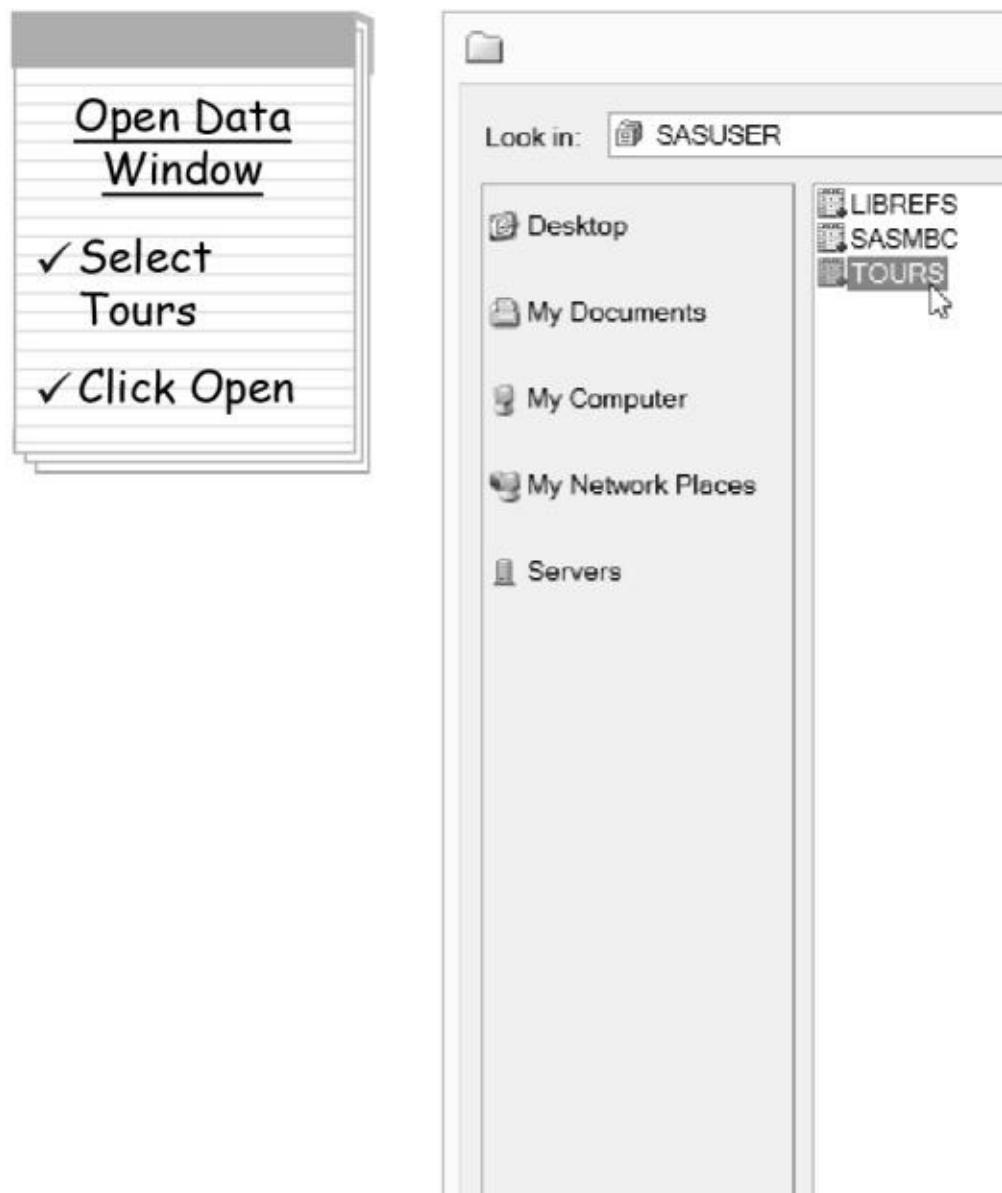
	File name:
	Files of type:

Click **SASUSER**, then cli



## 44    *The Little SAS Enterprise Guide Book*

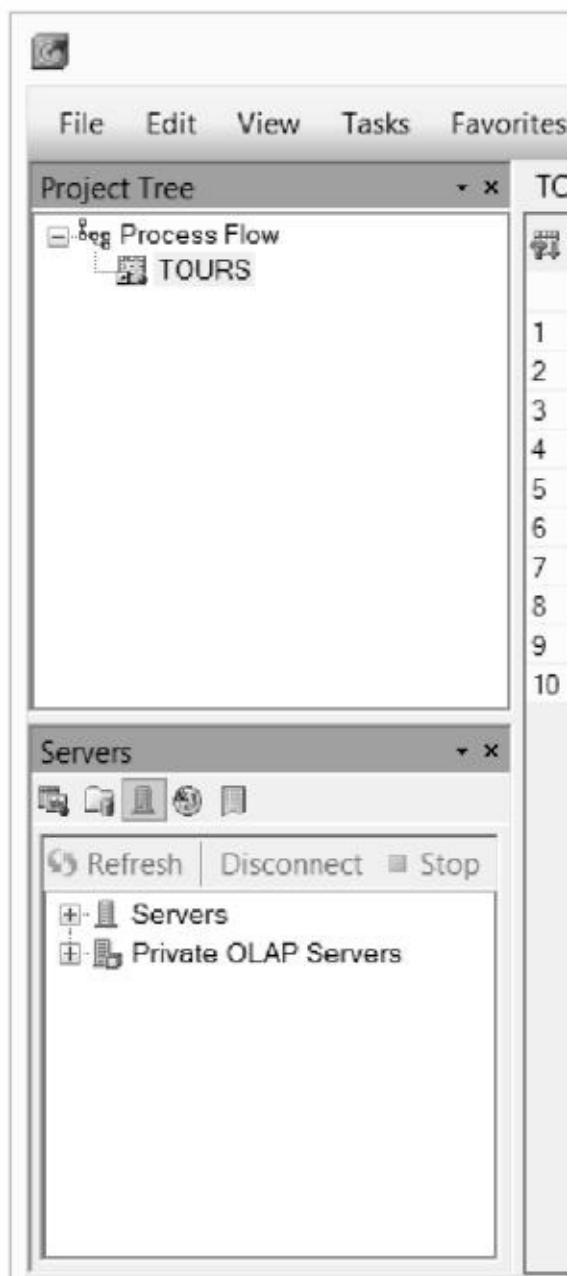
Select the **Tours** data table from the SASUSER library.







After you open the Tours



Ready

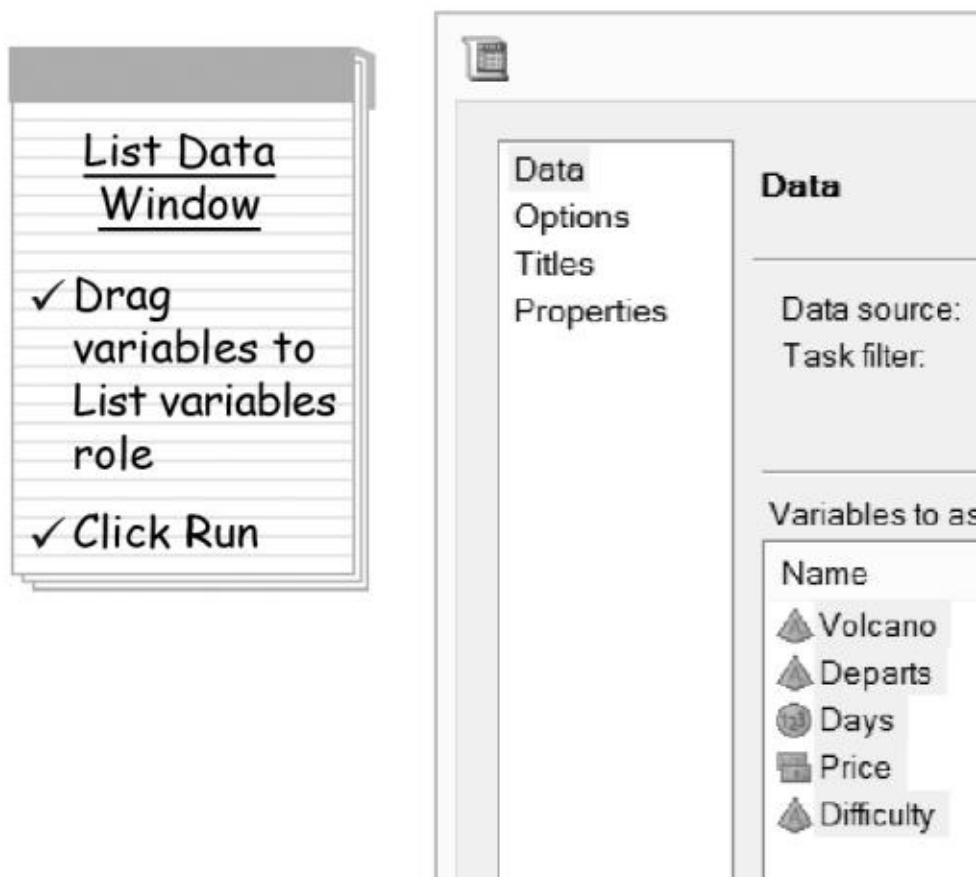
## Creating a simple report

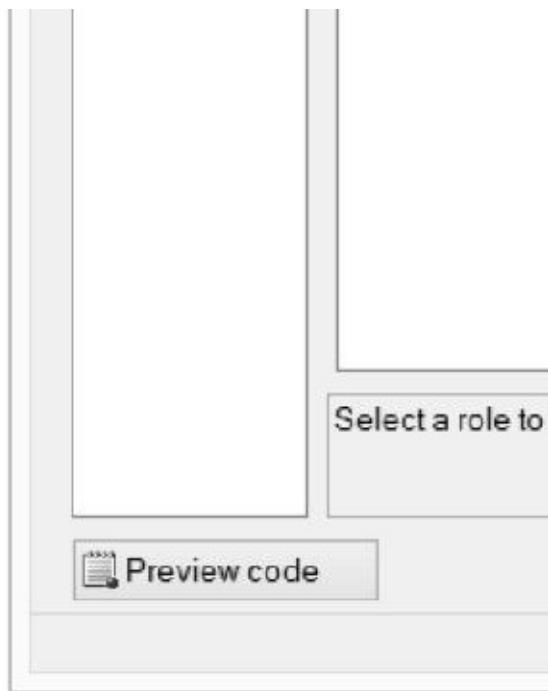
and Ice Tours company, using the workspace toolbar above

The screenshot shows a GIS application interface. On the left, a vertical workspace toolbar is displayed with the title "Workspace Toolbar" at the top. Below it are four items: "Select" with a checkmark, "Describe", "List Data", and a right-pointing arrow. To the right of the toolbar is a table titled "TOURS". The table has two columns: "Volcano" and "Depar". The data rows are numbered 1 to 10. The first row, "Etna", is highlighted with a black border. The data is as follows:

	Volcano	Depar
1	Etna	Catania
2	Fuji	Tokyo
3	Kenya	Nairobi
4	Kilauea	Hilo
5	Kilmanjaro	Nairobi
6	Krakatau	Jakarta
7	Poas	San Jose
8	Reventador	Quito
9	St. Helens	Portland
10	Vesuvius	Rome







When you have all the va



This produces a list of all  
The result appears in the  
format.

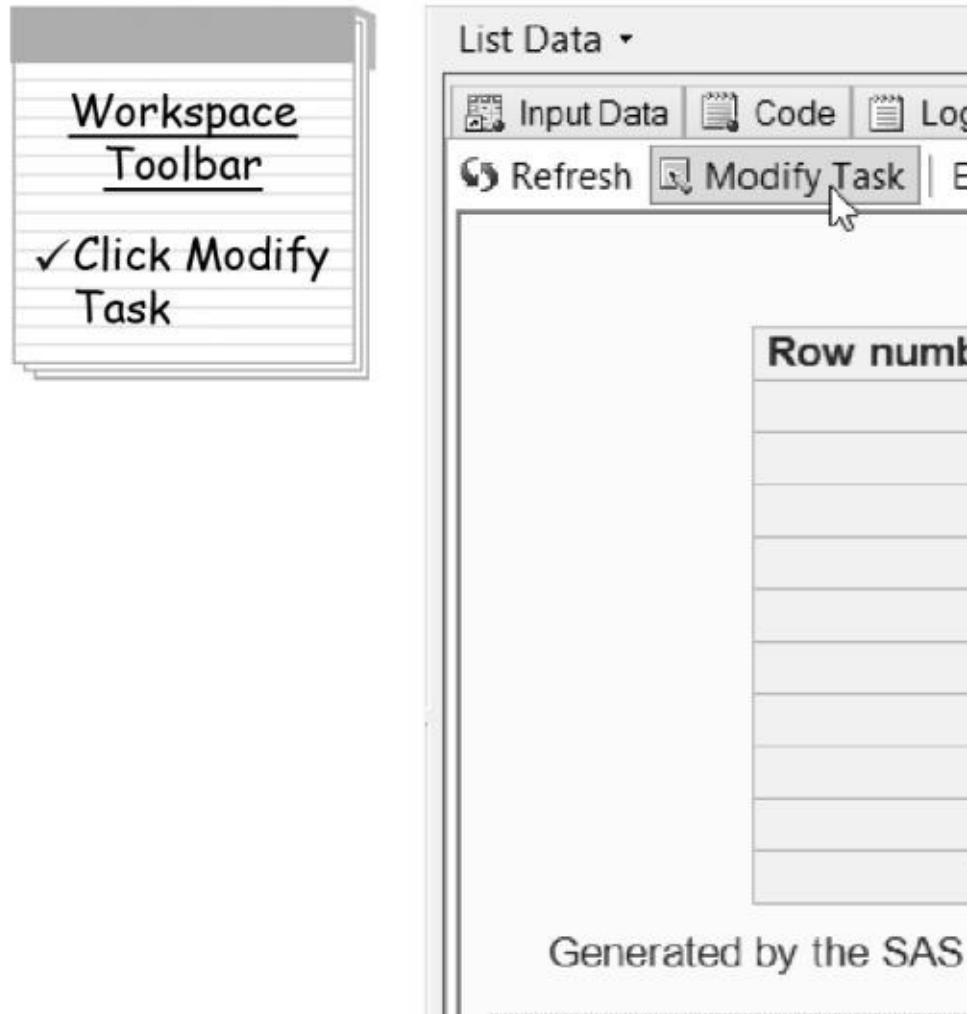
Generated by the SAS

SAS Report  
SAS Enterprise  
can be very  
more selective  
results in a  
single report  
builder.  
Results can  
to other



## Changing titles and

the price list, but it could  
listing that can be change  
the title and footnote for  
Data task by clicking Mo

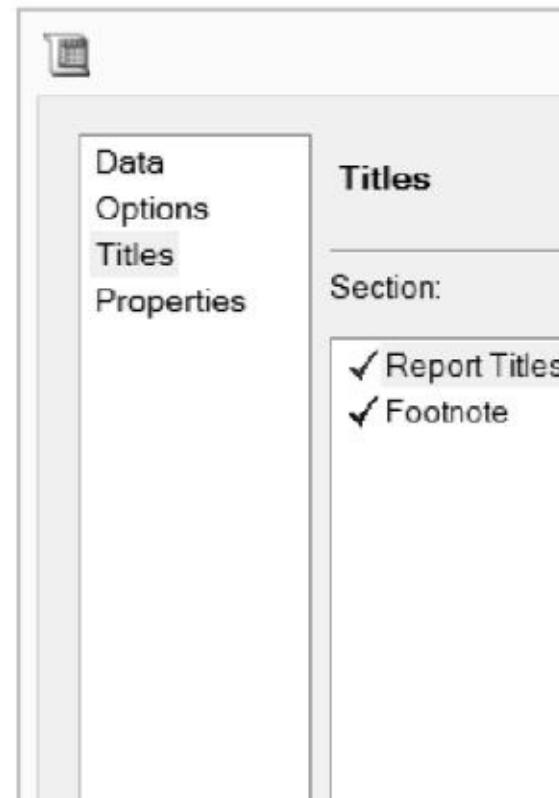


To reop  
Task or  
result, c  
either t  
select N  
window





Click **Titles** in the selection bar. This changes to both the titles in the box labeled **Section** in the window. SAS Enterprise Guide uses titles and footnotes. To change the **default text**. Now you can change the default text and replace it on the second line. This produces a report.



Checked sections  
based on current

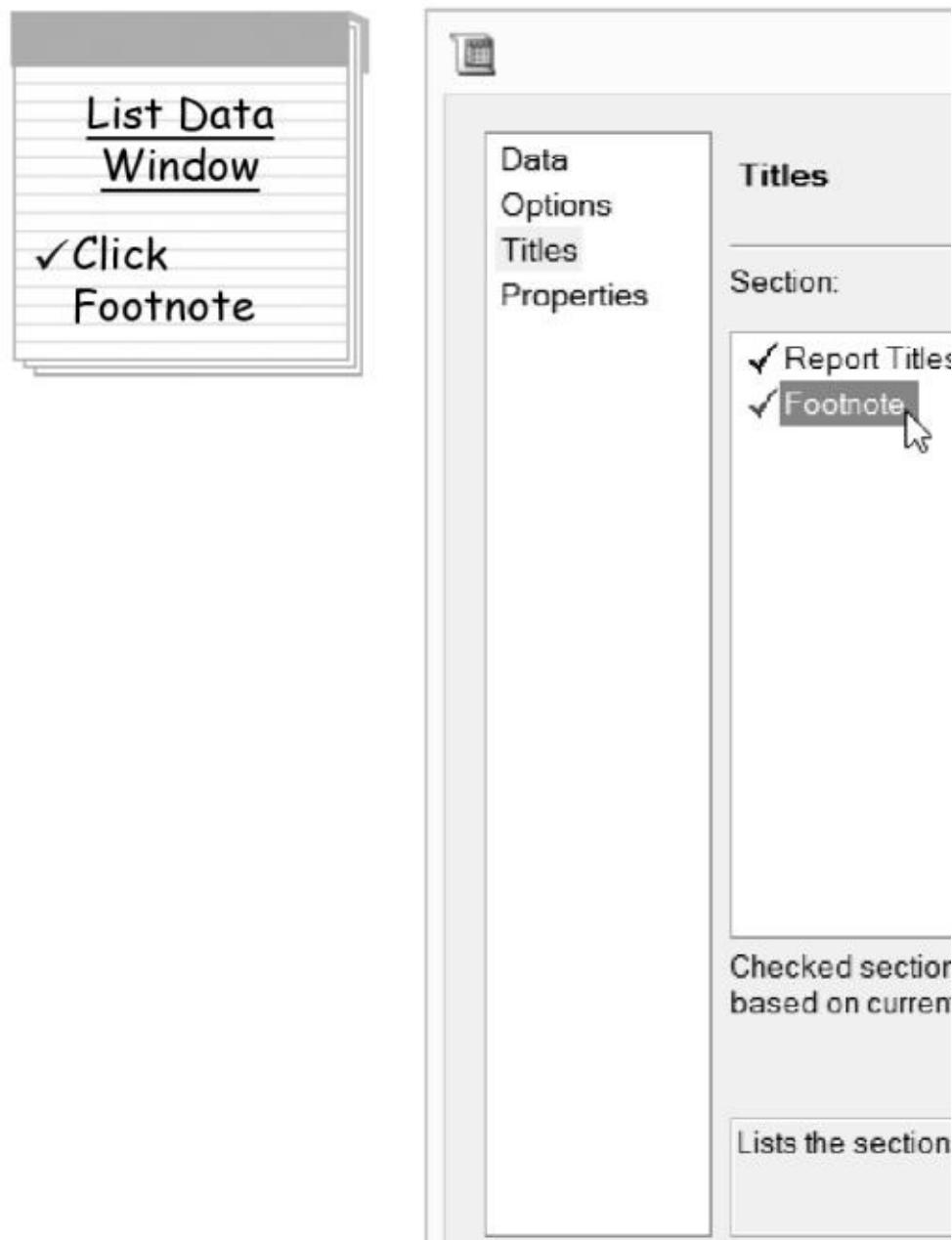
Displays the text

 Preview code



## 50    *The Little SAS Enterprise Guide Book*

To make changes to the fo





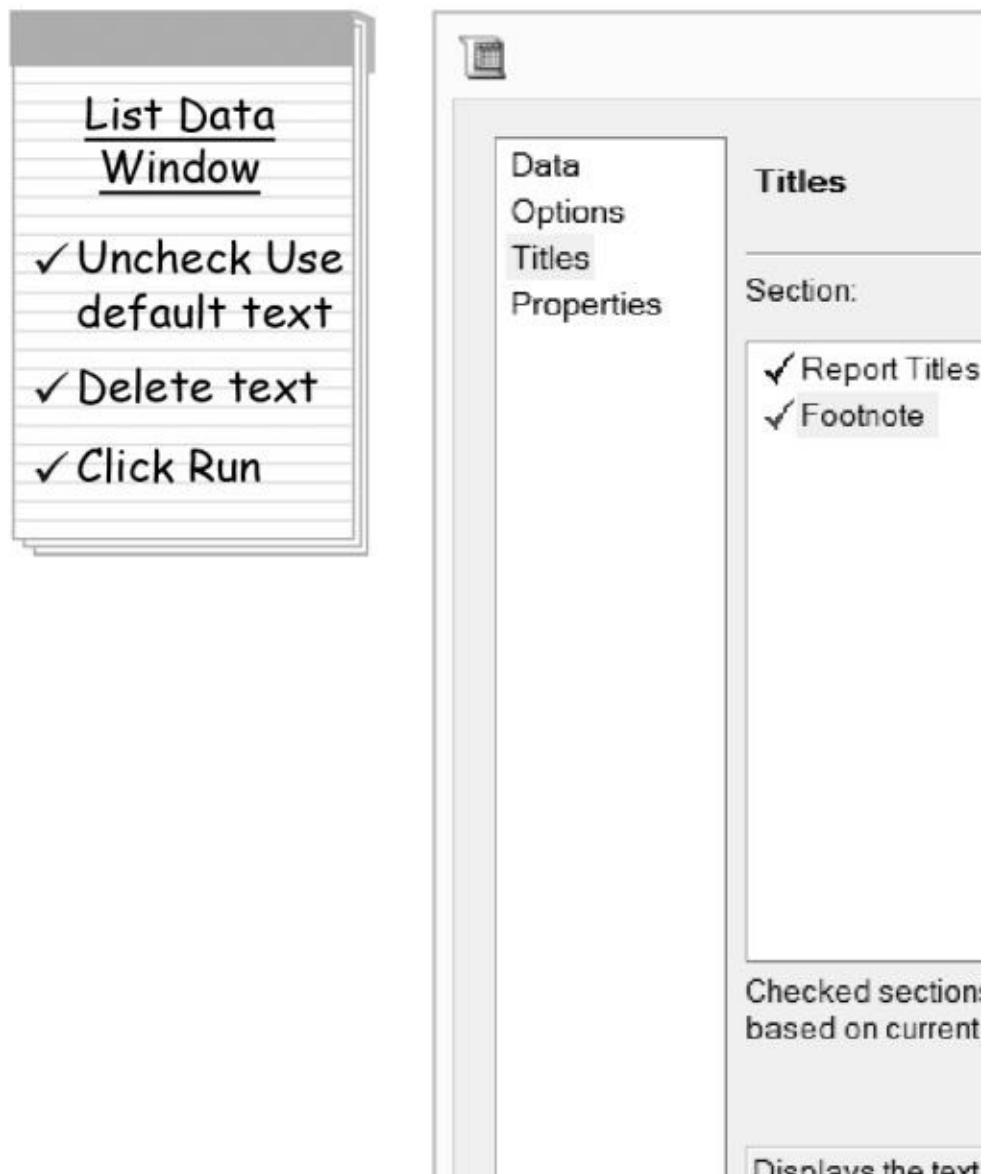
Preview code

## Why D

If you take a notice that it the bottom of macros (start These calls get that is genera produced, an report. You can selecting Tools Tasks Gener text for task have the new

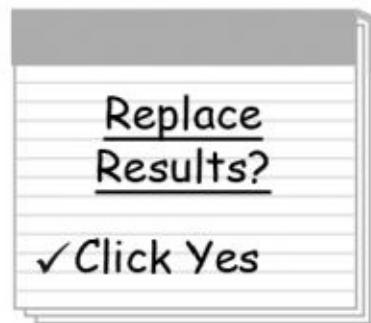


Change the footnote text  
because no footnote is needed.  
Guide supplied.





Click **Run** to produce a report.  
Enterprise Guide asks if you want to





## **52** *The Little SAS Enterprise Guide Book*

The following report will have a footnote.

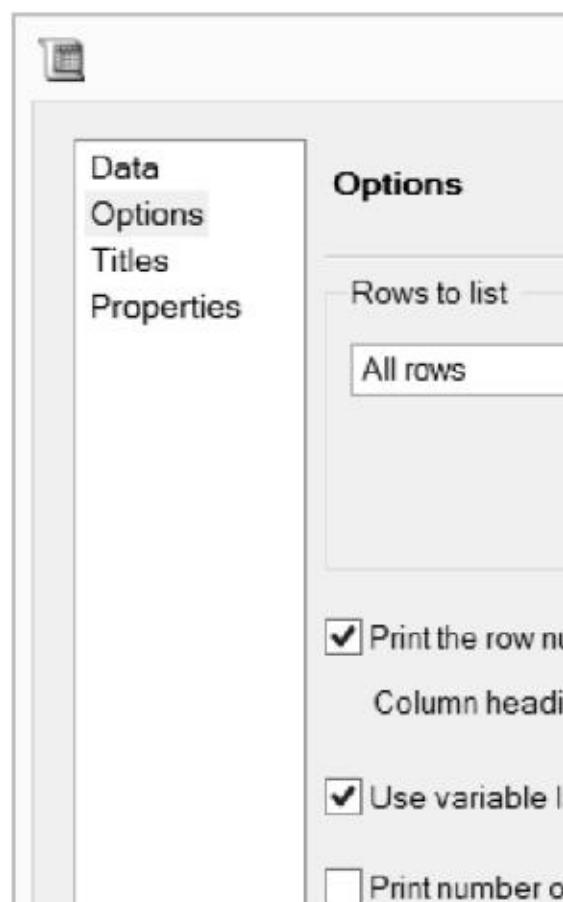
Row number	V
1	E
2	F
3	K
4	K
5	K
6	K
7	P
8	R
9	S
10	V







## List Data Window



## Changing column labels

report, open the List Data toolbar for the results. Click Enterprise Guide will show a number. You can choose **number**. For this report, click the heading with the word **T**

Round values

Divide page in

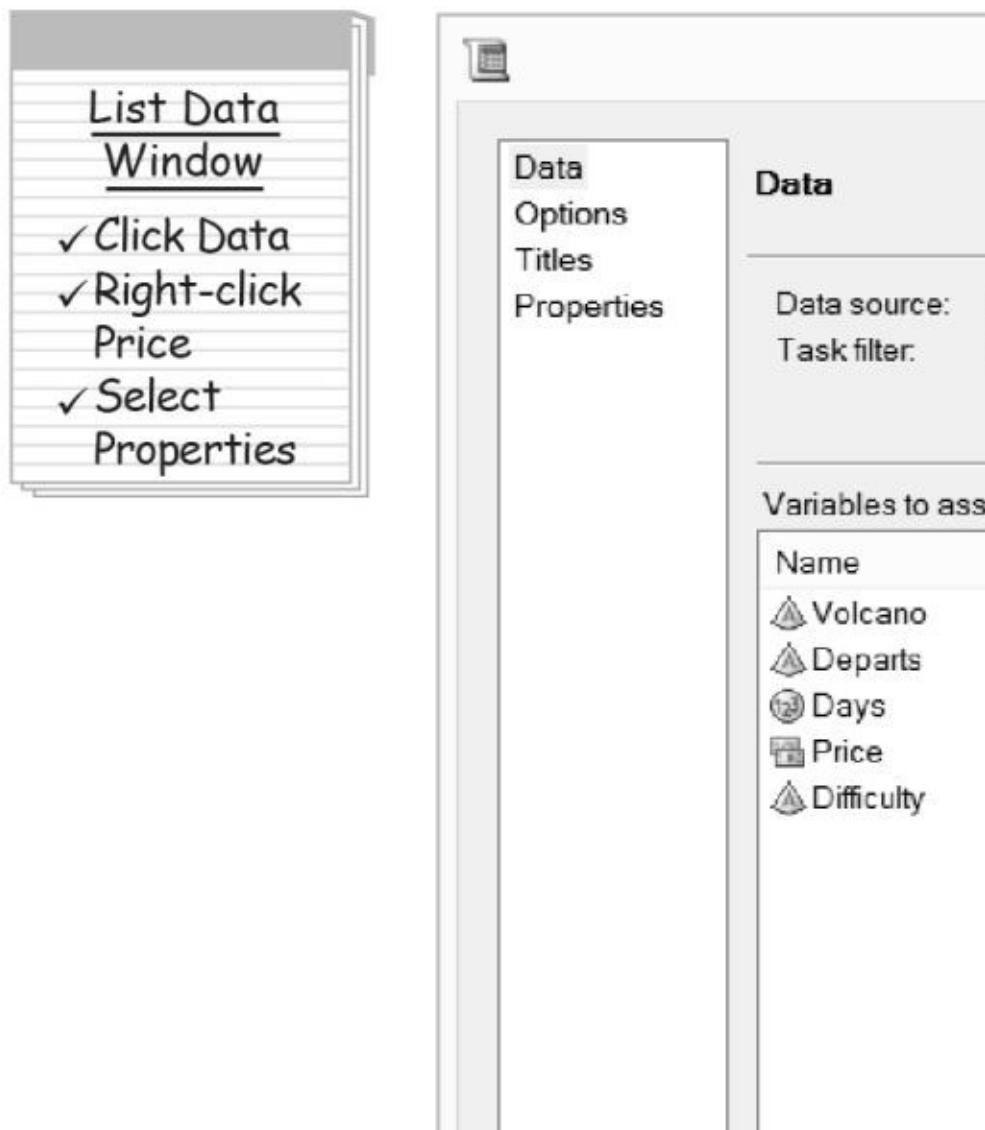
Specify a label fo

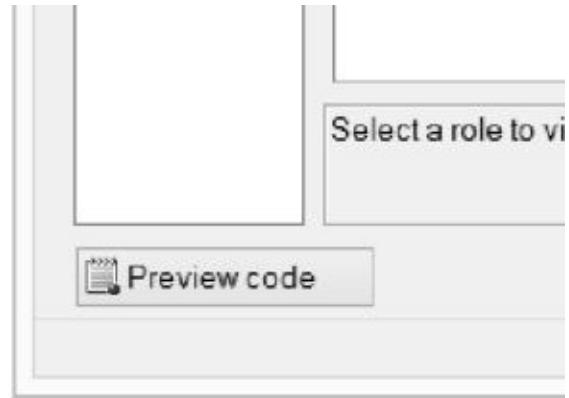
 Preview code



## 54 The Little SAS Enterprise Guide Book

Now click **Data** in the selected menu bar and select **Properties** associated with it and you will see the **Properties** window.

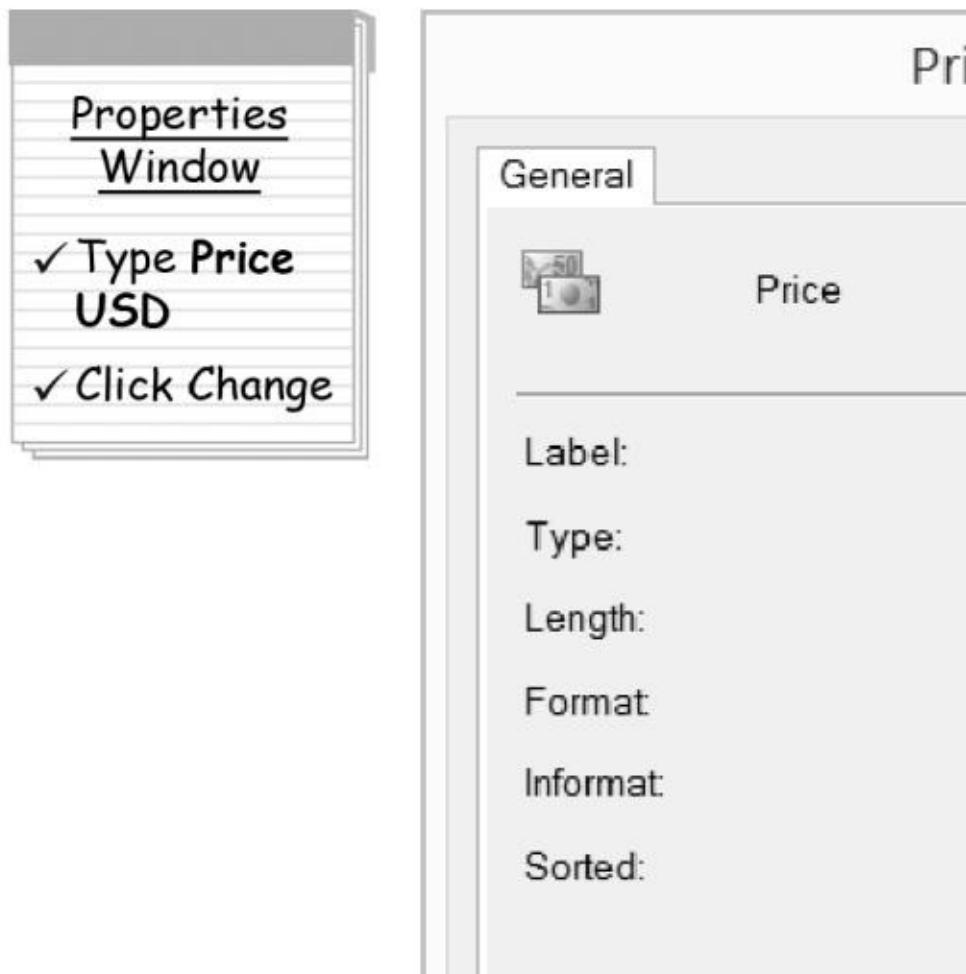




This opens the Properties



There are six properties listed in the Properties Window. Click on the Label and the Format. Click on the List Data task. The properties can be used for labeling the variables. In SAS Enterprise Guide we will label "Price USD" by typing "Price" in the Label field.



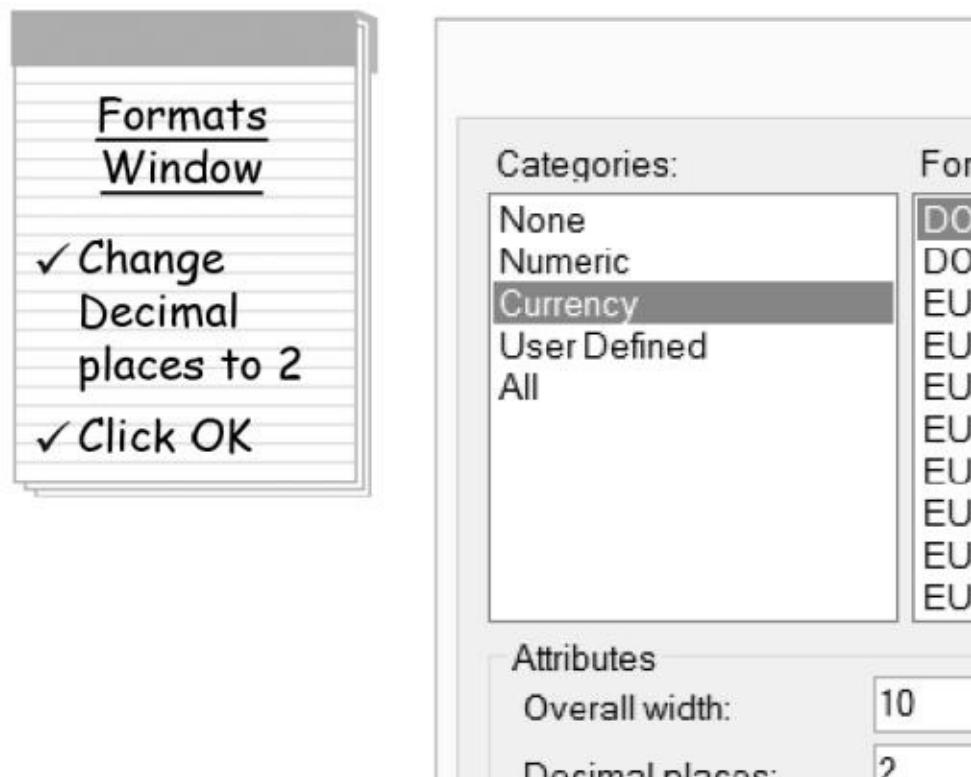


The current format for Pr  
for Price. This opens the ]



## 56 The Little SAS Enterprise Guide Book

Formats determine how values are displayed. For example, if you created a format named Price, the value 1234.56 would be displayed as \$1,234.56. The dollar sign is part of the format name, and the comma is included because it was assigned to Price. The period at the end of the format name is removed when the value is displayed, then the number is displayed. Because there is no number after the decimal point, no decimal places will be displayed. Change the value 1234.56 to 1234.5678 and click OK next to **Decimal places**. The value will be displayed as \$1,234.5678.



Decimal places:

Description  
dollar sign, commas and decimal point

Example

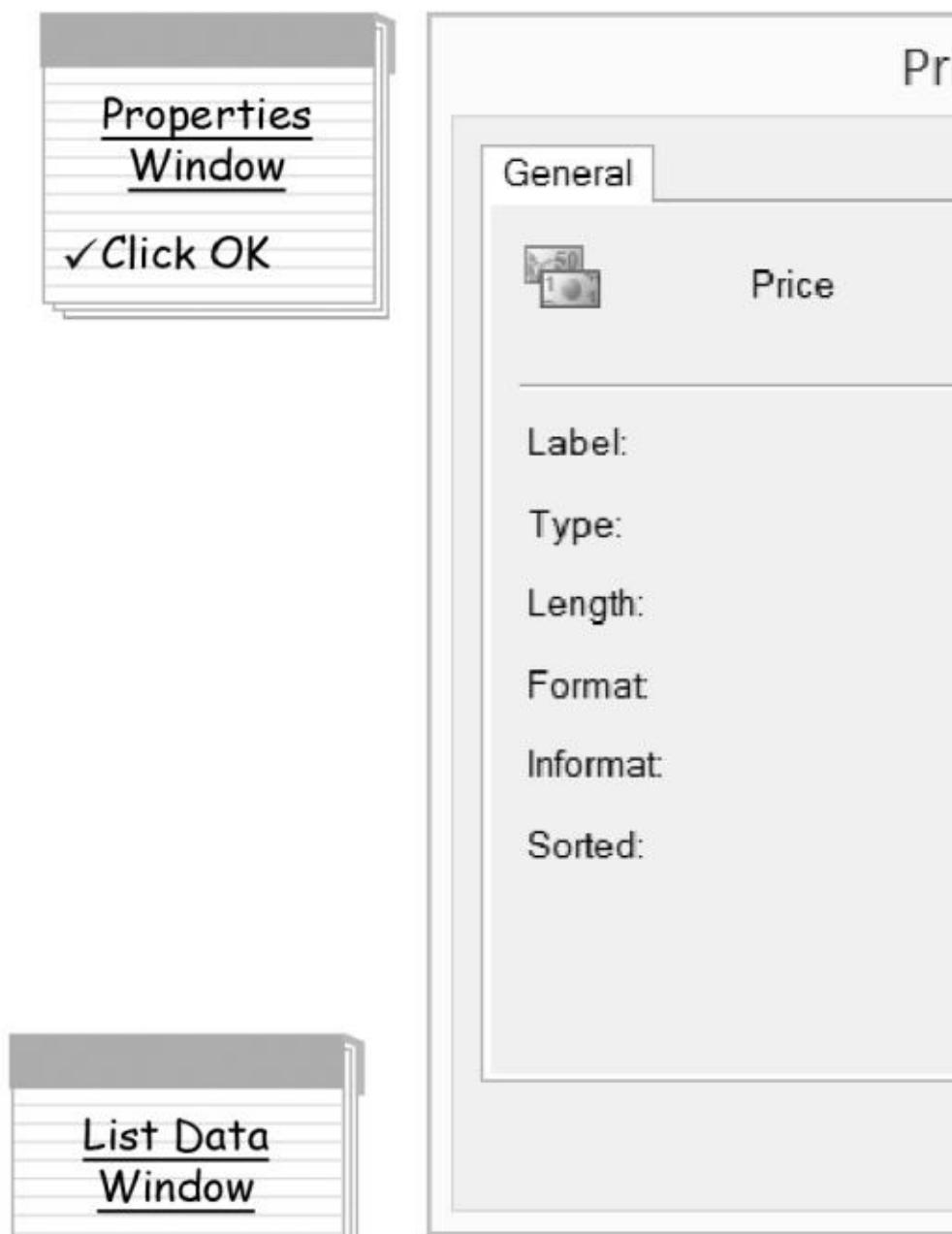
Value: 12345.1

Output:

Click **OK** to close the Form

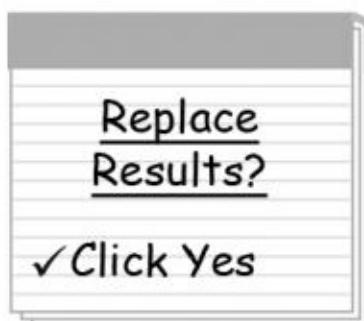


Now Price has a label and





Click **OK** to close the Proj



Select **Yes** when SAS Enter



## **58** *The Little SAS Enterprise Guide Book*

The following report will  
the row number and the  
dollars and cents.

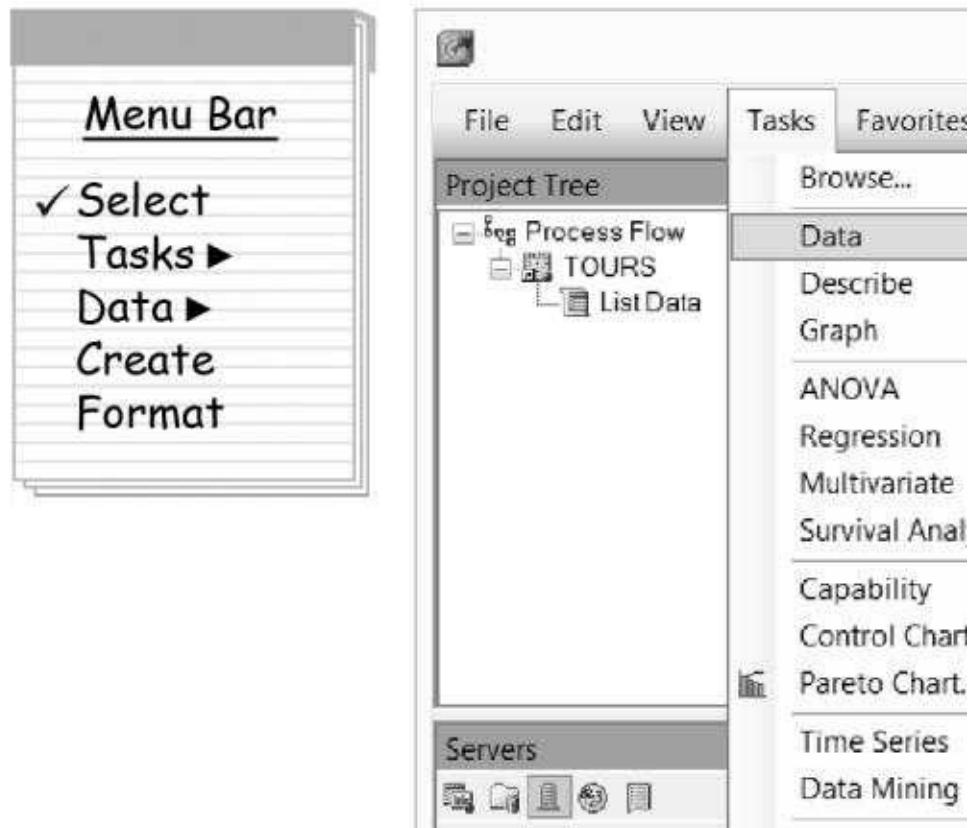
Tour	Volcano
1	Etna
2	Fuji
3	Kenya
4	Kilauea
5	Kilimanjaro
6	Krakatau
7	Poas
8	Reventador
9	St. Helens
10	Vesuvius

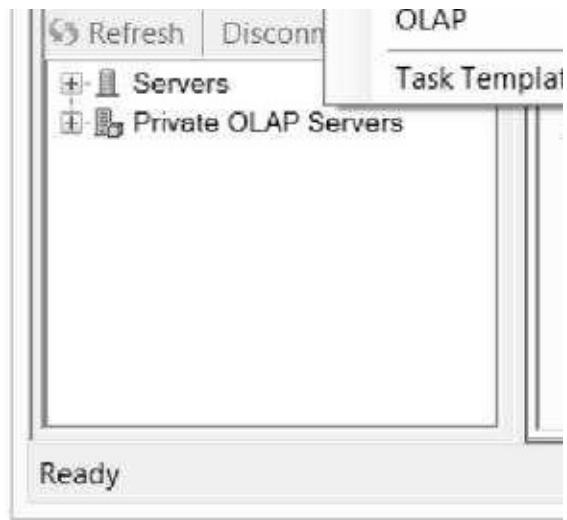




## **Defining your own**

Guide, but sooner or later defined. Fortunately, SAS formats. This type of form **Difficulty** has coded values price list; it would be better create a user-defined format open the Create Format viewer.



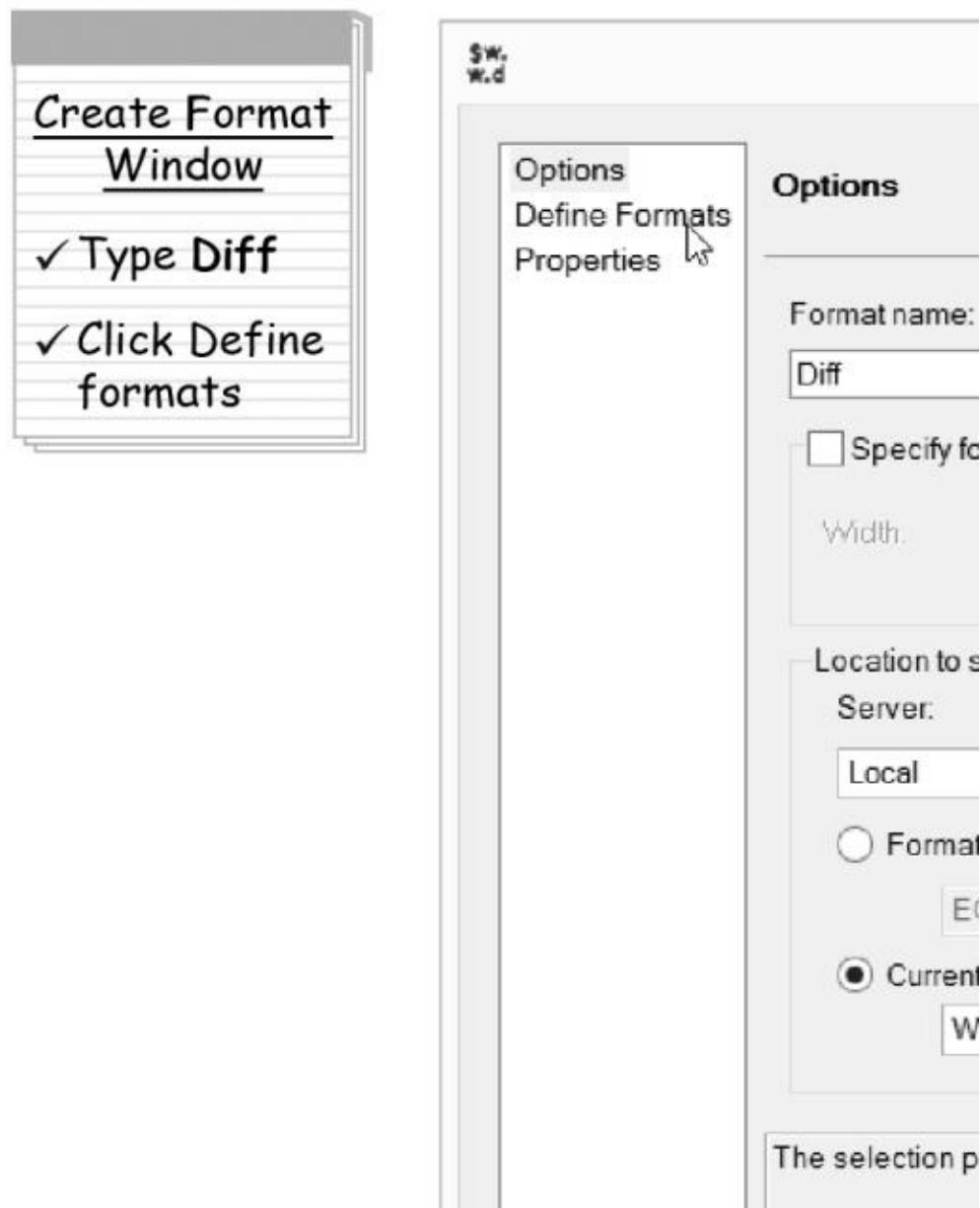


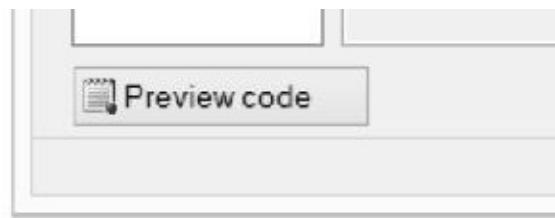
Formats can be temporarily stored in the WORK library or in a SAS Enterprise Guide library. When you want to use, the format at a later time you open that library and choose the format available for the project. You can also store formats for other projects. The formats stored in the WORK library are used for all subsequent tasks in the current Flow and the formats stored in a library are used for all subsequent tasks in the server is used for all subsequent tasks in the current Flow and the server is also displayed in the



## 60    *The Little SAS Enterprise Guide Book*

Give the format a name because this format will be used for a



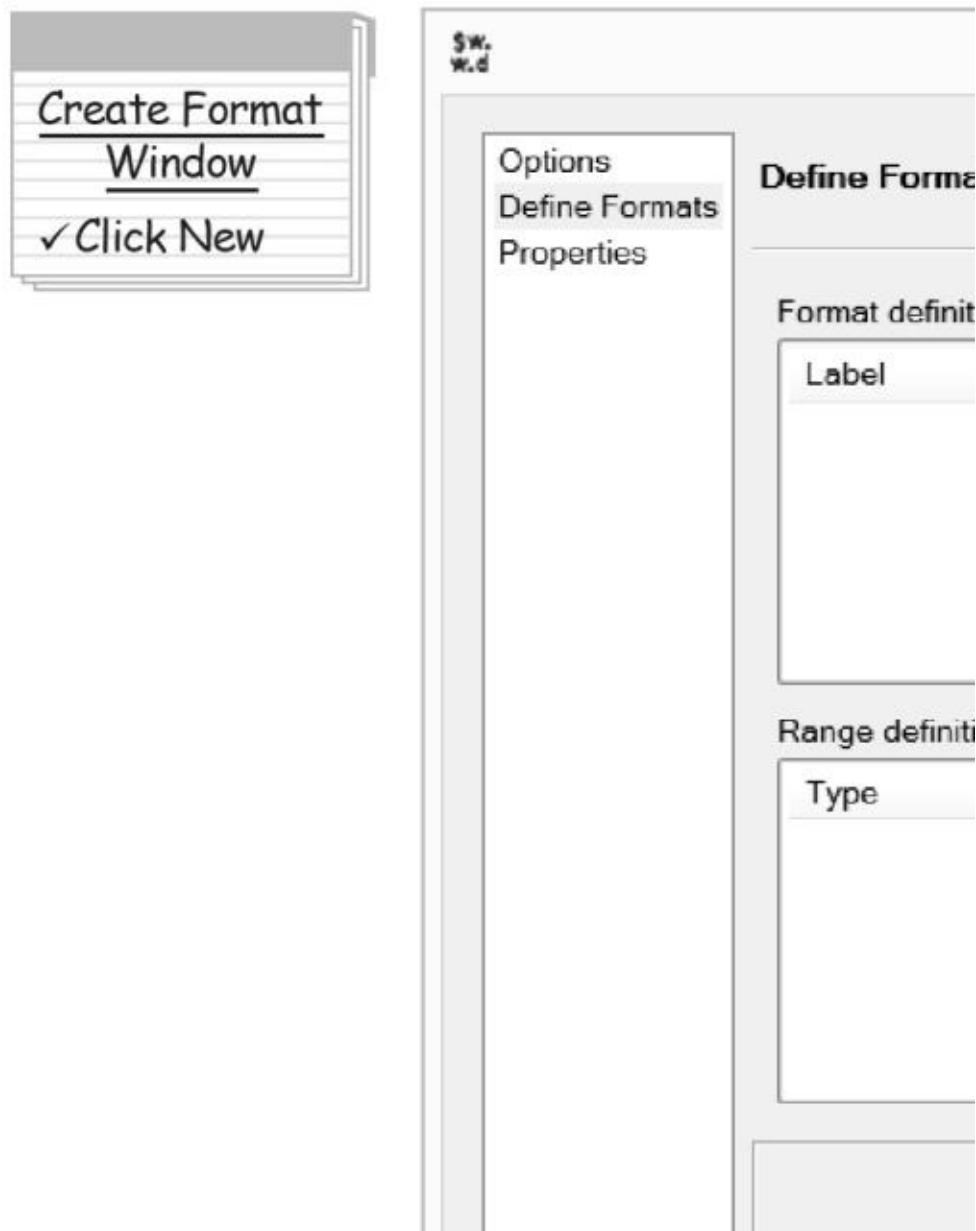


Click **Define formats** in the toolbar to define the format.

Character length  
fewer than 32  
be 32  
name  
under  
number



Defining a format is a two-step process:  
1. Define the format  
2. Assign values.

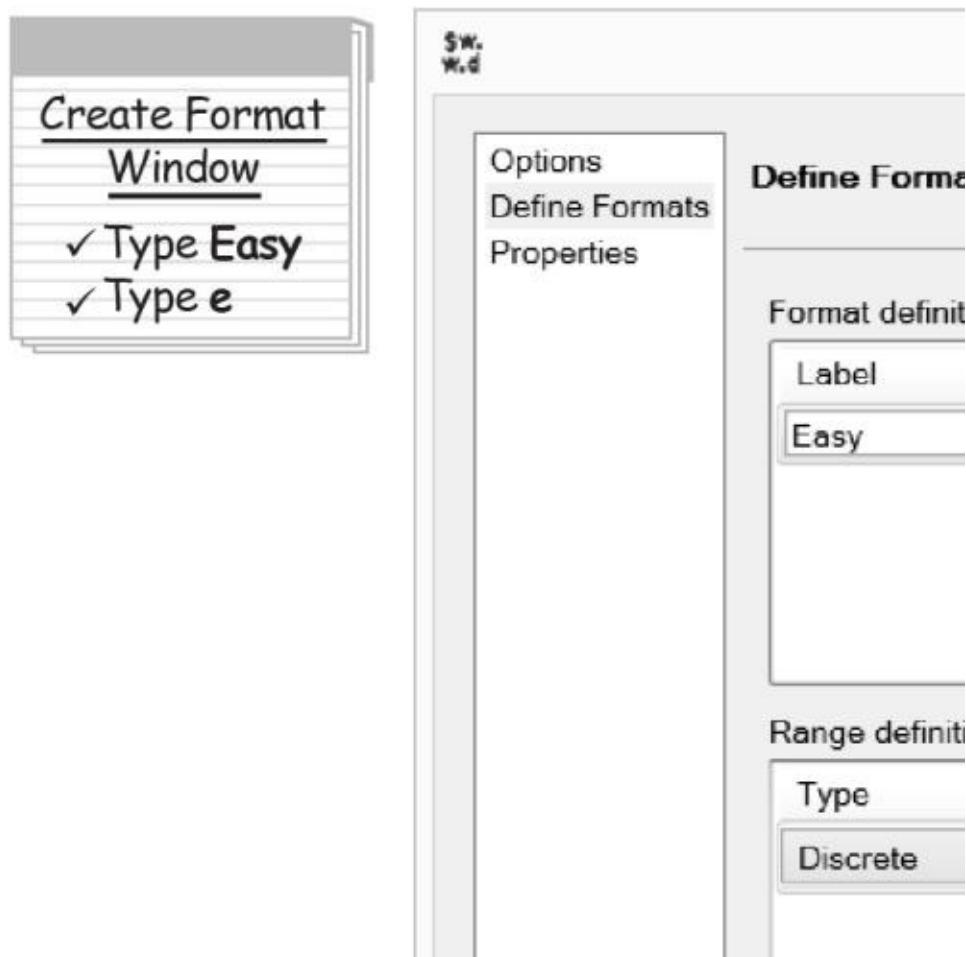


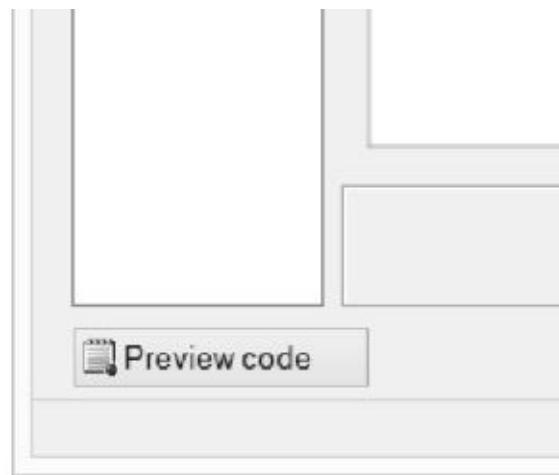




## 62 The Little SAS Enterprise Guide Book

Type **Easy** in the box under Label in the Define Format window. Second, in the box under Type, type Discrete. Third, click OK to close the window. The label will now appear in the output when the case of the text matches the label. As you type the value, it will appear in the output next to the label Easy.

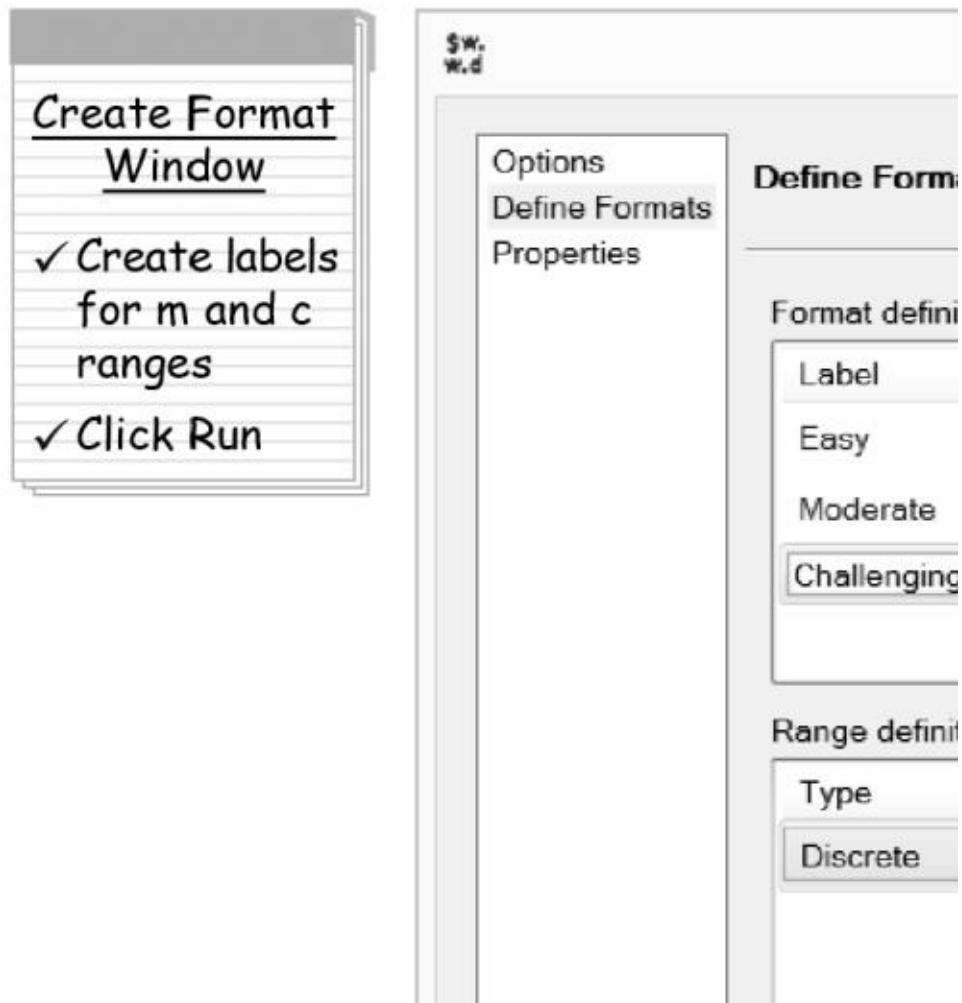


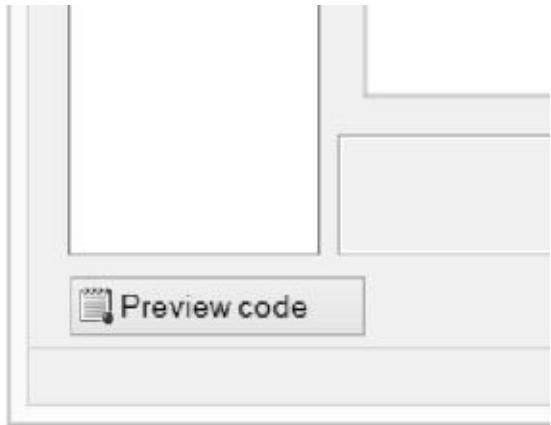


You can enter  
in the Range  
another new  
SEP, OCT, and  
you are in the  
range of value  
**Range** from  
want the value  
format is char  
that fall alpha  
be included.



Now add labels for the other window, click **New** and type definitions portion of the Format definition portion under **Label**. In the Range under **Values**.



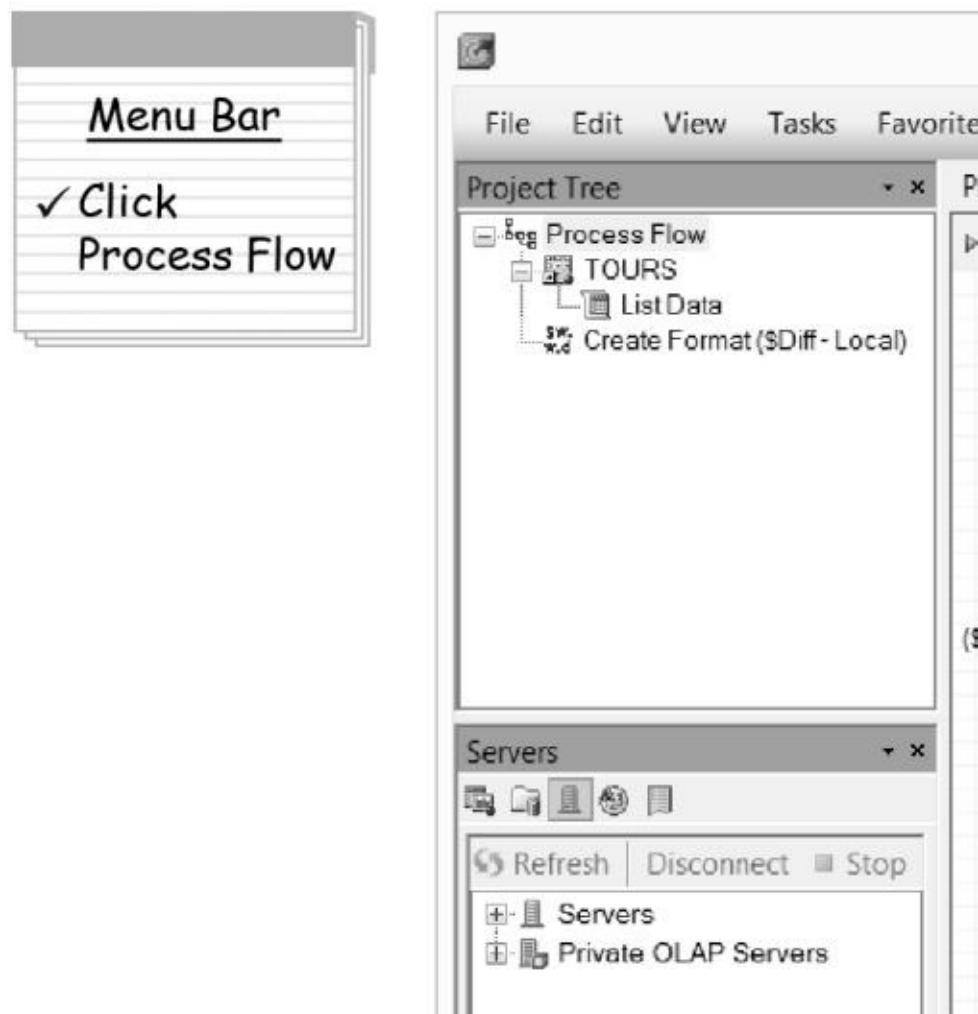


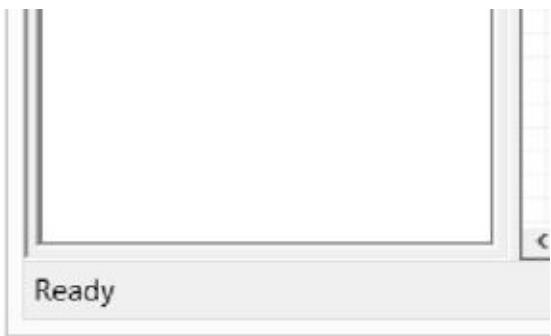
When you have all the la



## 64 The Little SAS Enterprise Guide Book

Since there is no output file, nothing is displayed in the workspace. Click the Process Flow. An icon for the Create Format task is displayed. Notice that the Create Format task has nothing in the report chart.

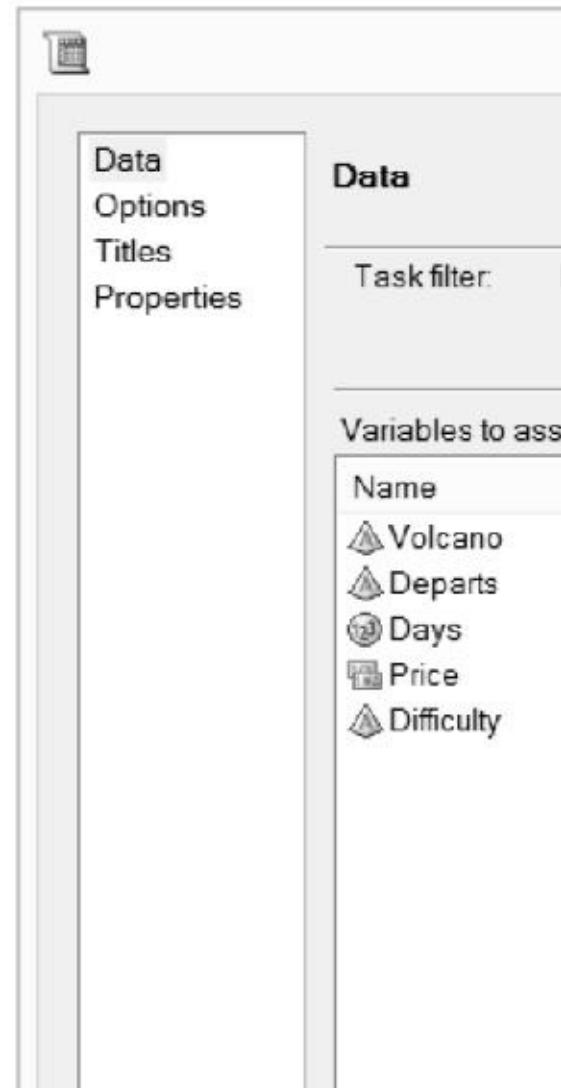


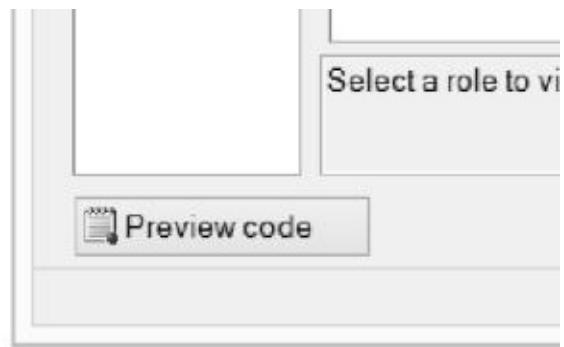






You created the format, but you still need to associate the new format with the existing data. To do this, right-clicking the **List Data** icon in the Project Tree or the **Difficulty** item in the List Data window, then selecting **Properties**.





This opens the Properties

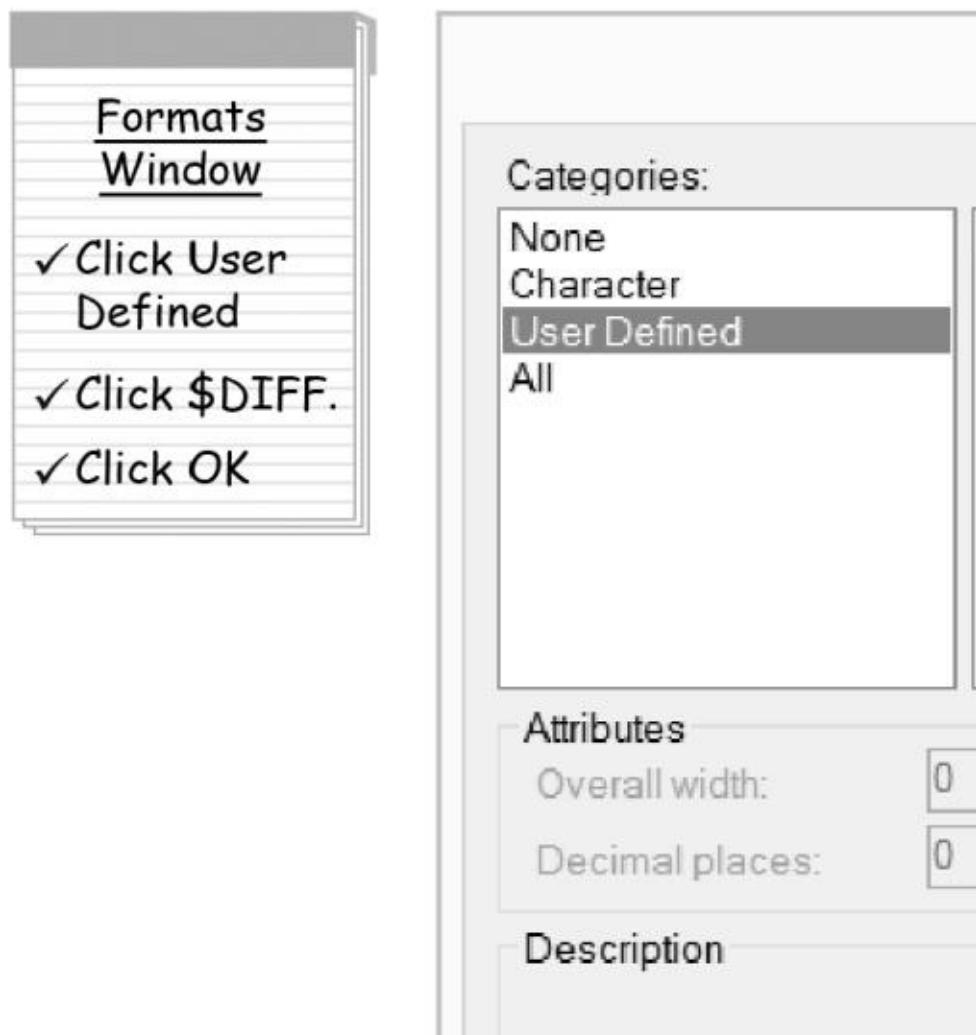
A screenshot of the "Properties Window". On the left, a sidebar has the title "Properties Window" and a note "✓ Click Change". The main area is titled "General" and contains several configuration fields:

- A triangular icon with the letter "A" next to the label "Difficulty".
- A field labeled "Label:"
- A field labeled "Type:"
- A field labeled "Length:"
- A field labeled "Format:"
- A field labeled "Informat:"
- A field labeled "Sorted:"



## 66    *The Little SAS Enterprise Guide Book*

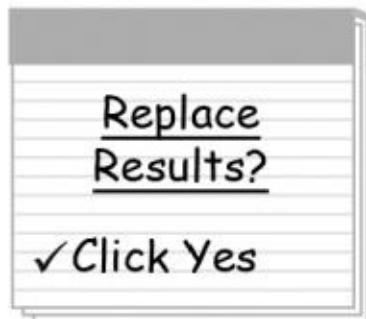
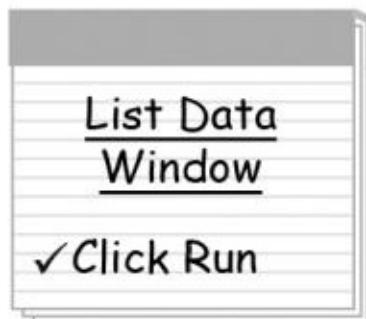
From the **Categories** list, Enterprise Guide session appear in the list of formats. If you do not have additional formats, click the **User Defined** button.



Example  
Value:  
Output



Click **OK** to close the For  
to return to the List Data  
replace the previous resu

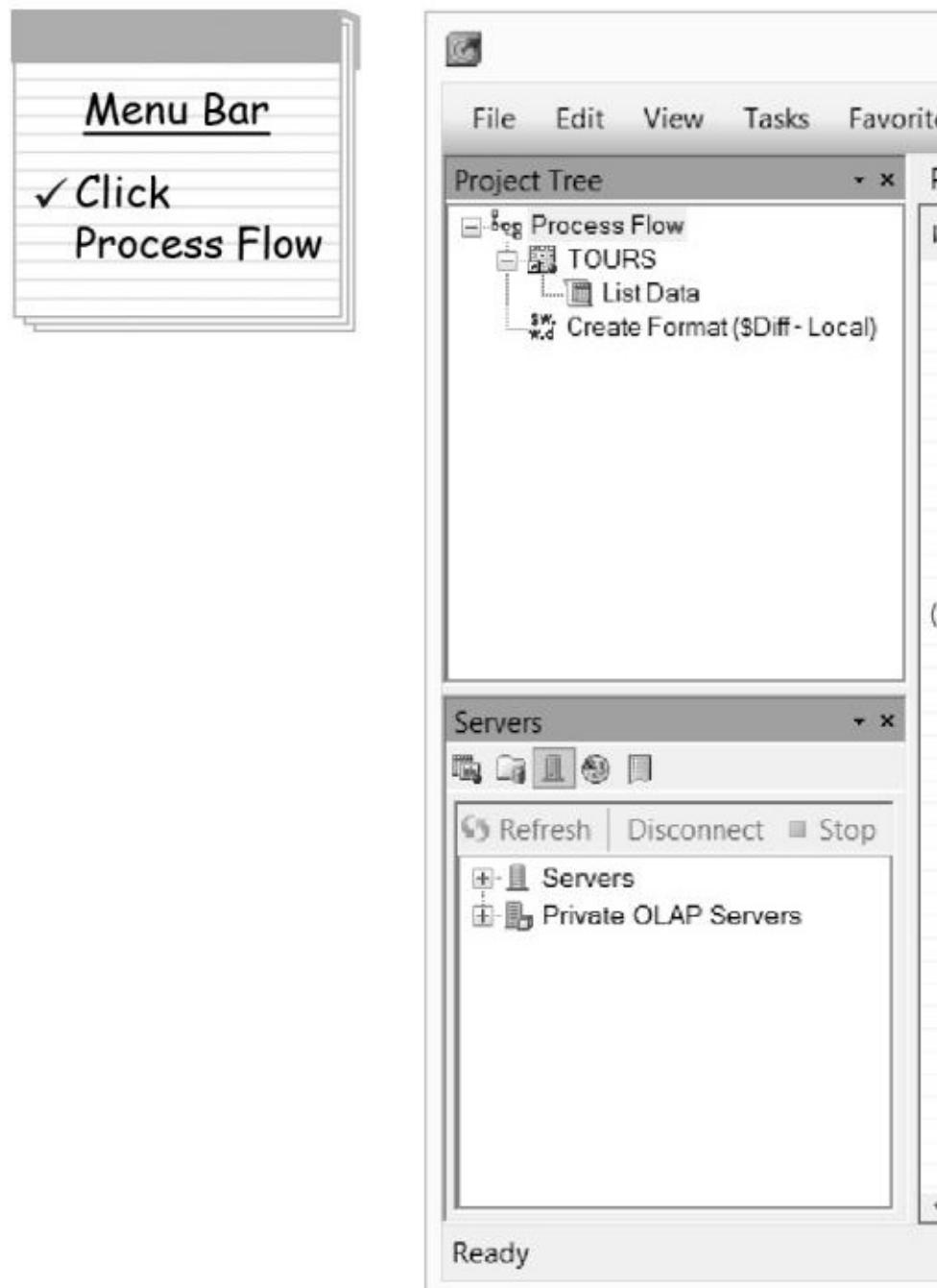




The following report will  
for the Difficulty variable

Tour	Volcano
1	Etna
2	Fuji
3	Kenya
4	Kilauea
5	Kilimanjaro
6	Krakatoa
7	Poas
8	Reventador
9	St. Helens
10	Vesuvius

Click **Process Flow** on the toolbar. The List Data task uses the icon between the two task icons.

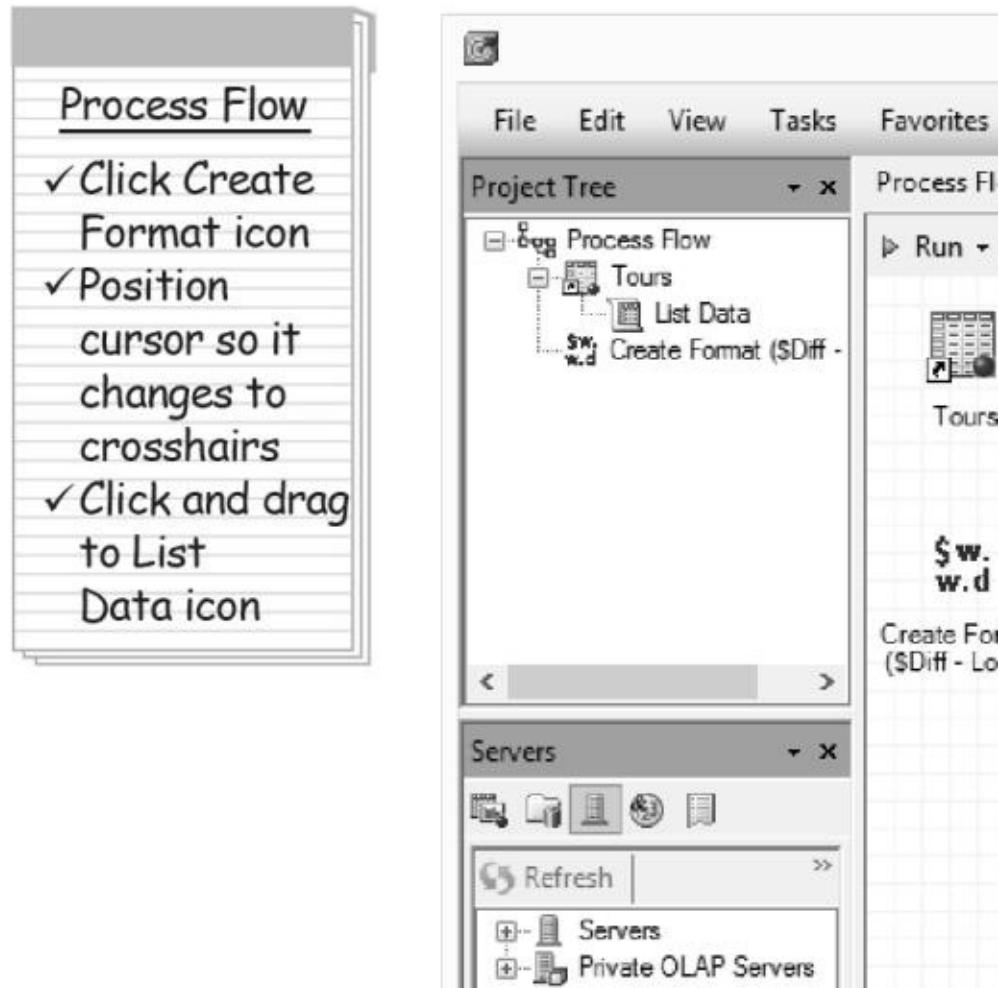


MenuBar  
✓ Click  
Process Flow



## 68    *The Little SAS Enterprise Guide Book*

**Adding manual link**  
needed for the List Data icon  
then position the cursor to  
crosshairs . Click and drag



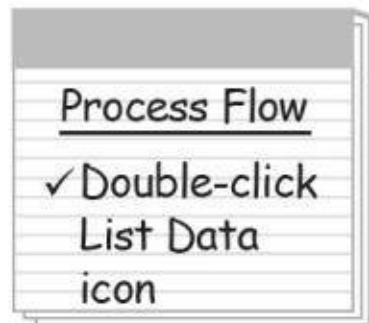


When you release the mouse button, look closely, you will see that the automatic links use solid lines. The task will run before the Link task.

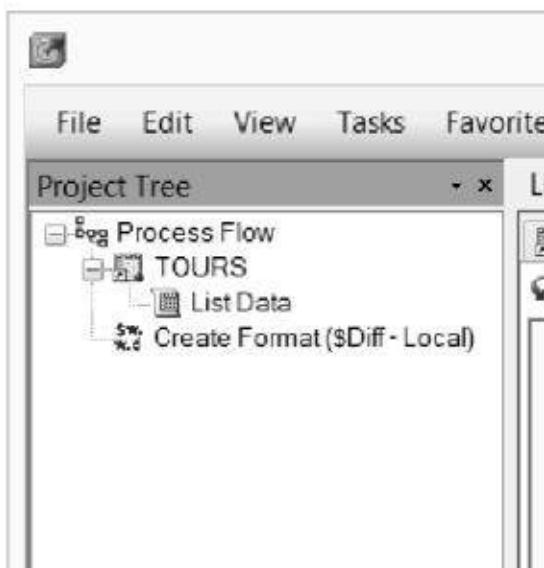


## Selecting a style for

Guide has a style associated with it (no style). All the reports in Guide have a style, and the default style for Guide is the style for the color scheme, fonts, and other settings. You can change the default style for your reports, or you can choose from, and create your own.



To change the style for reports, click the icon to show the results of the task, and then click the style you want to use.



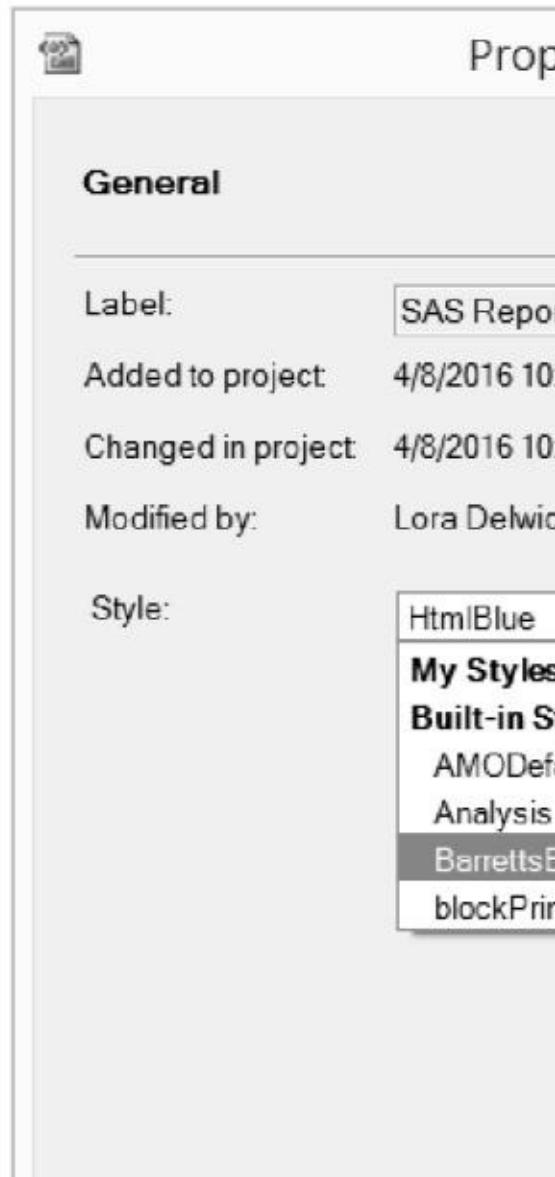


If you find a static  
Guide projects  
**Options** from  
a result format  
PowerPoint. Th



## 70 The Little SAS Enterprise Guide Book

This opens the Properties task. Select the **BarrettsBlue** style.



Click **OK**. Your report sh  
of blue.

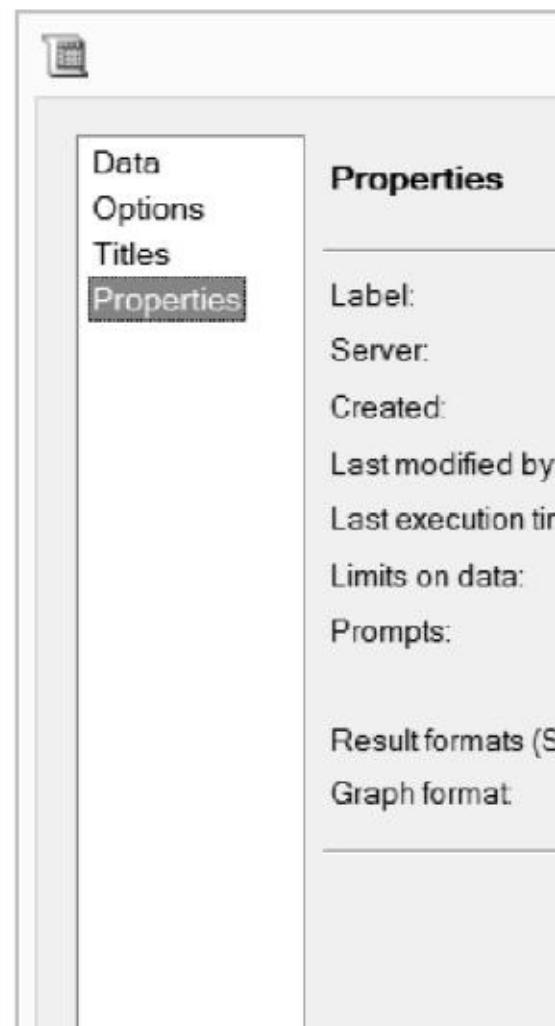
Tour	Volcano	Dest
1	Etna	C
2	Fuji	T
3	Kenya	N
4	Kilauea	H
5	Kilmanjaro	N
6	Krakatau	J
7	Poas	S
8	Reventador	G
9	St. Helens	F
10	Vesuvius	F





## Changing the output

produced have been in the form of HTML, RTF, PDF, Excel, etc. To change the output format, click the **Modify Task** on the workspace toolbar or click the **Properties** button in the selection pane on the left.



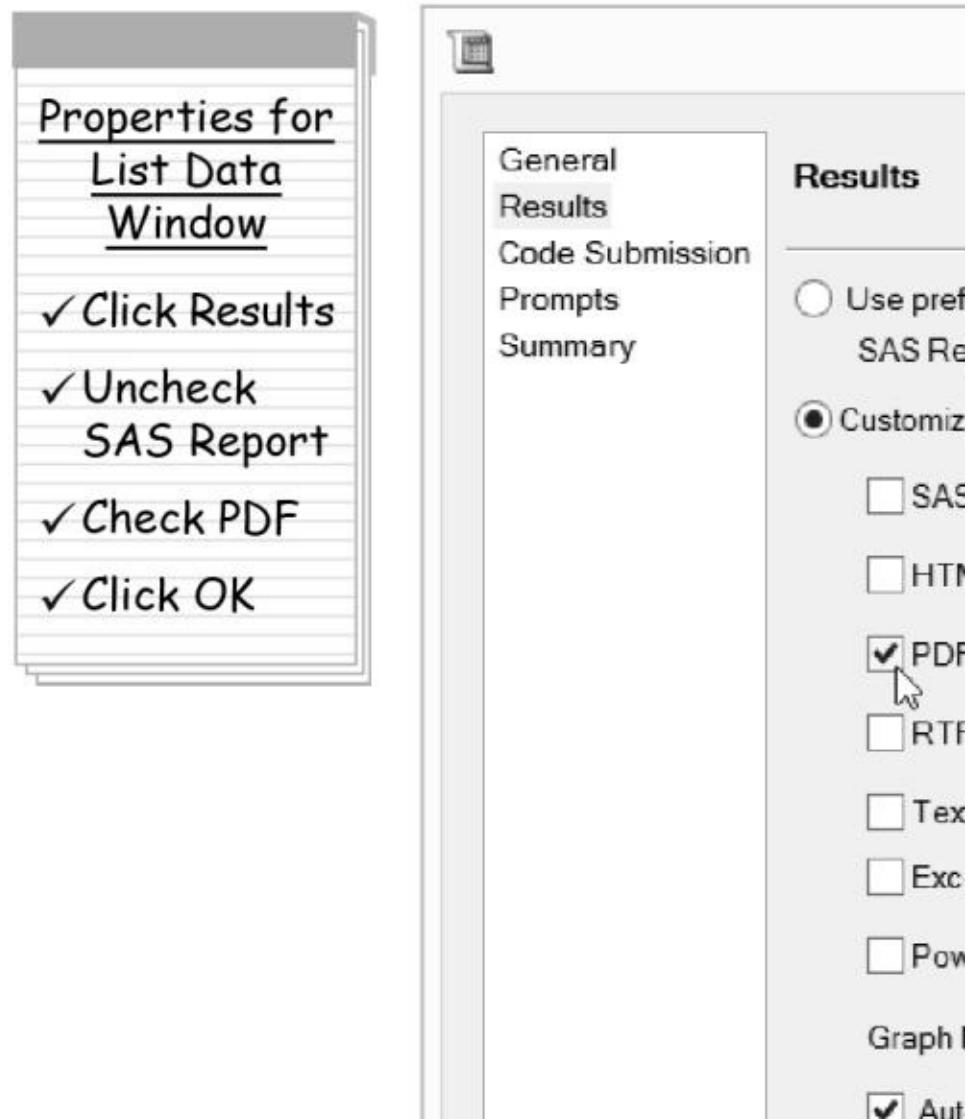


Click **Edit** to make changes.



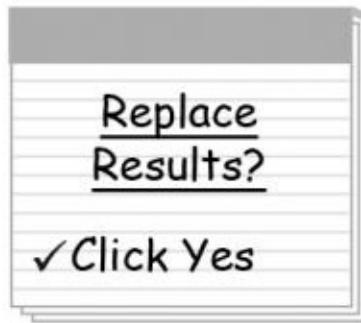
## 72 The Little SAS Enterprise Guide Book

This opens the Properties pane on the left. On the Results tab, you can choose what output formats to generate as well as choose alternative report names. You can also turn off the SAS Report name.





Click **OK** to close the Progress window  
**Yes** to replace the previous results

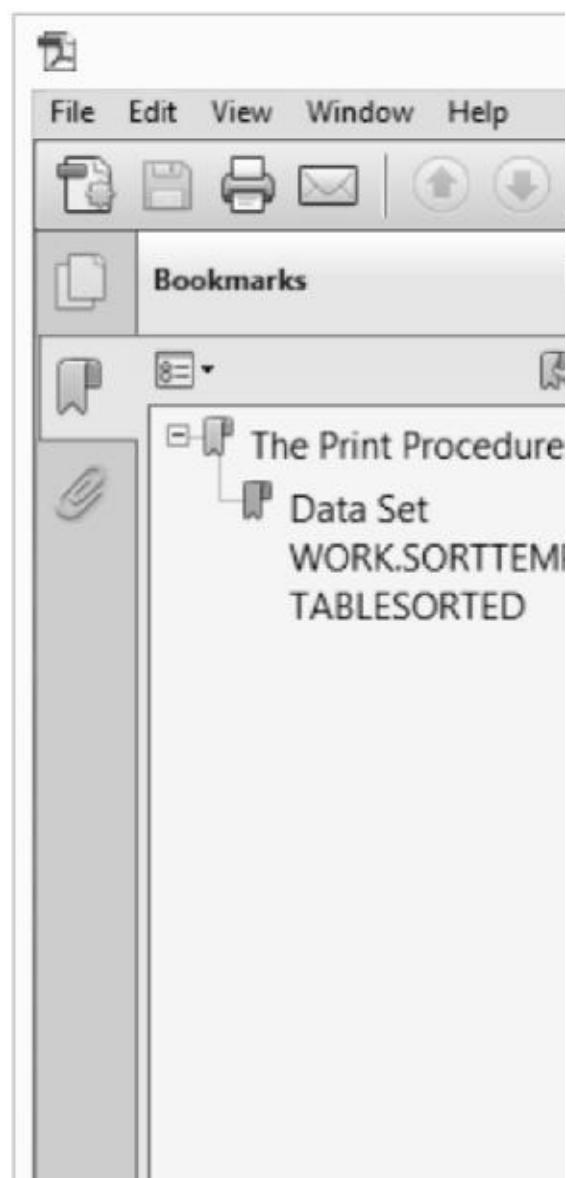


## Choosing Data

To use the defined data, select the **Run** task from **Tools -> Run**. This will open a progress window for the task. If you click **OK**, the software will use the result of the previous run. If you click **Yes**, it will use the current run's results. If you click **Cancel**, the task will not be run. Note that if you have made changes to the task, the results will be replaced. To prevent this, make sure to save your changes before running the task. You can also change the behavior of the task by selecting it and then clicking **Tools -> Options**.



PDF results will open in a new window  
**View** on the **Results** tab

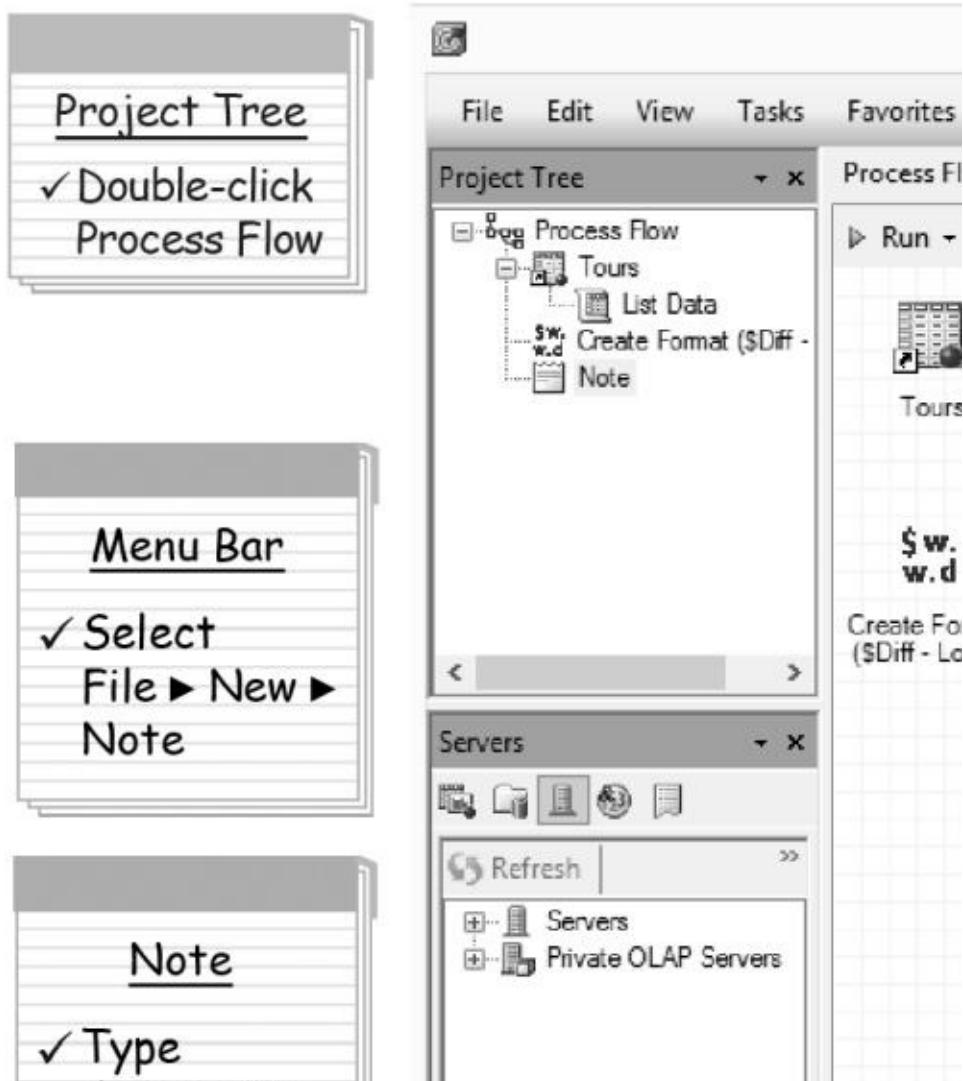






## Completing the tutorial project description.

Doubtless you have selected **New ▶ Note** from the menu bar. This opens a window that appears in the bottom right corner of the screen.





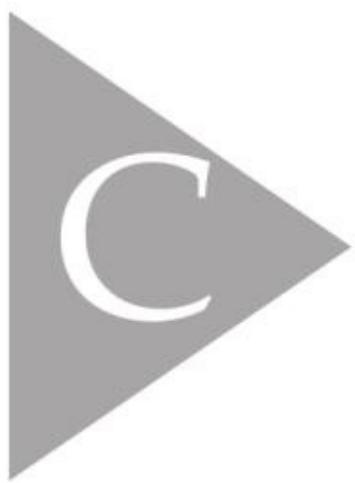
Now save the project and the menu bar. Navigate to project the name **Tutorial** SAS Enterprise Guide.











“ The pc  
makes us :

From *John of the Mountains: The*



 C

## Working with Data in

Often the data tables you a new column based on e your analysis. Using SAS manipulate your data. Th

- Selecting columns
- Using the Expressions palette
- Filtering rows
- Sorting data

**Before beginning this section**  
which contains information for downloading the file.



**Starting SAS Enterprise Guide**  
clicking the **SAS Enterprise Guide** from the Windows taskbar will bring the Enterprise Guide window to the foreground. The Welcome screen will appear, allowing you to open an existing project or starting a new one.



W

Select one of these options:

**Open a project**

- C:\FAI Tours\Projects\Tutorial
- C:\FAI Tours\Projects\Tutorial
- More projects ...

---

**New**

- [New Project](#)
- [New SAS program](#)
- [New Data](#)

---

**Assistance**

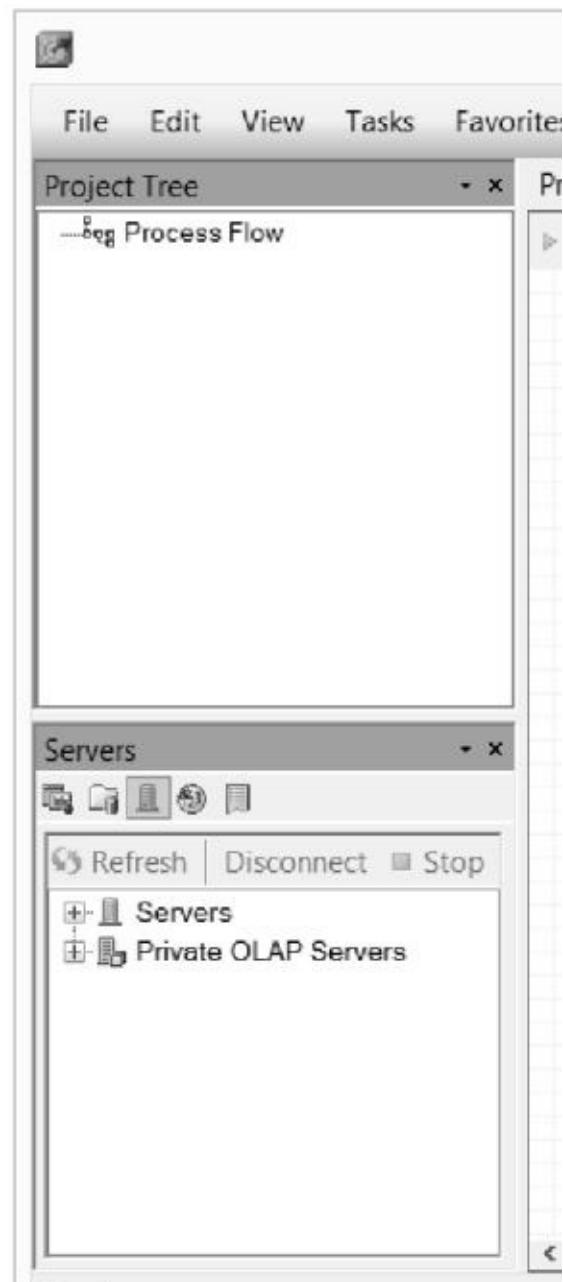
- [Tutorial: Getting Started with](#)

[Don't show this window again](#)



## 78 The Little SAS Enterprise Guide Book

This opens an empty SAS

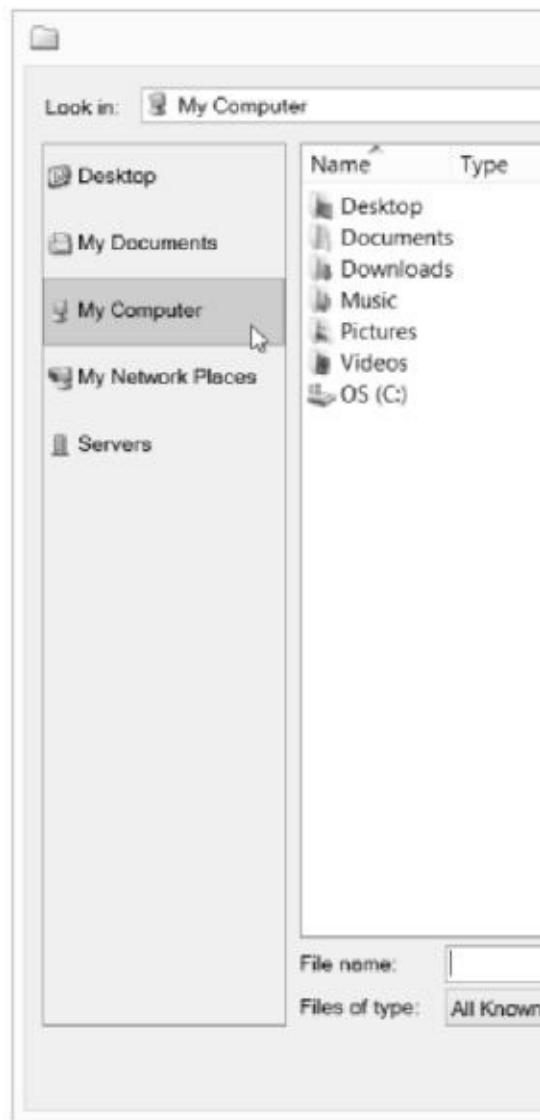


Ready

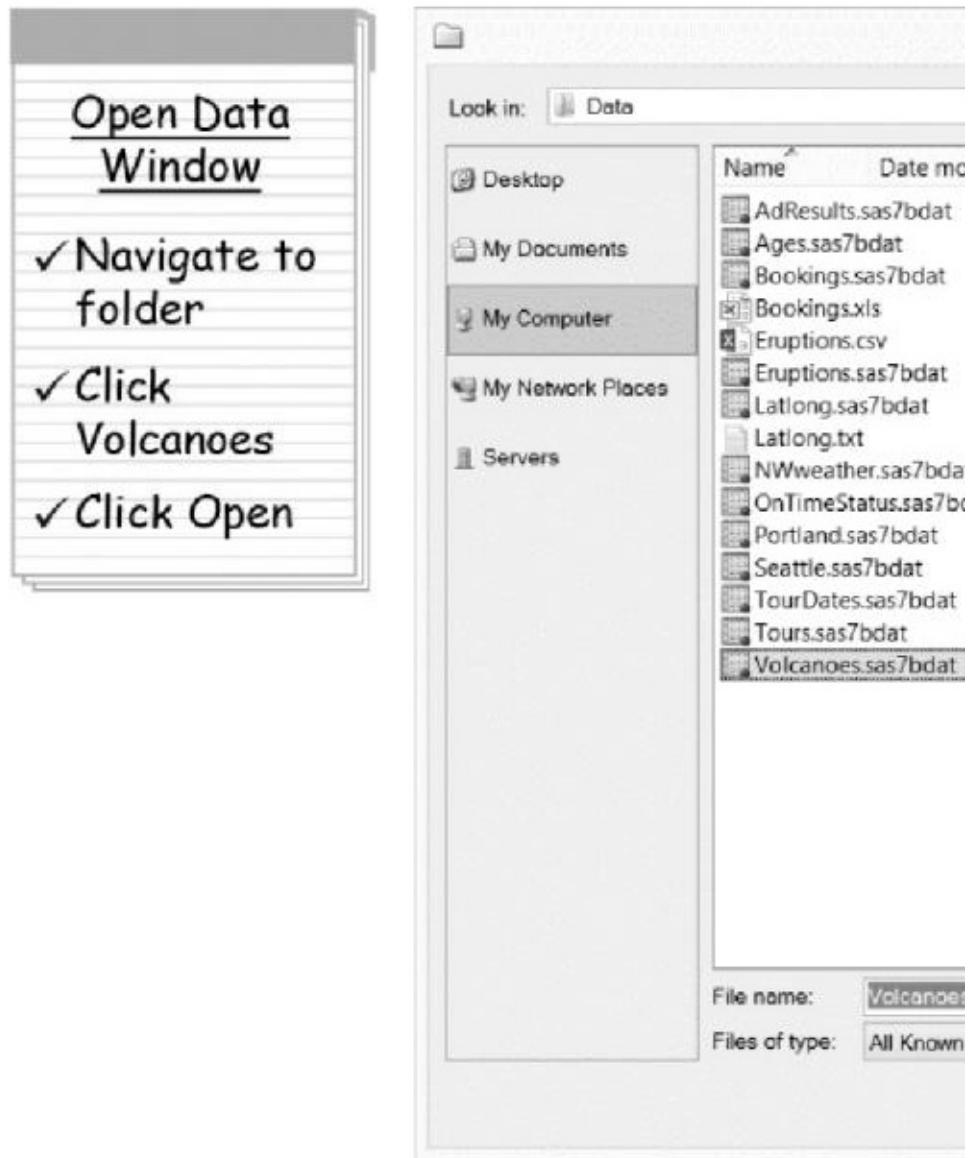




**Opening the Volcan**  
selecting File ► Open ► I  
stored in a defined SAS li



Navigate to the location where the data is stored.

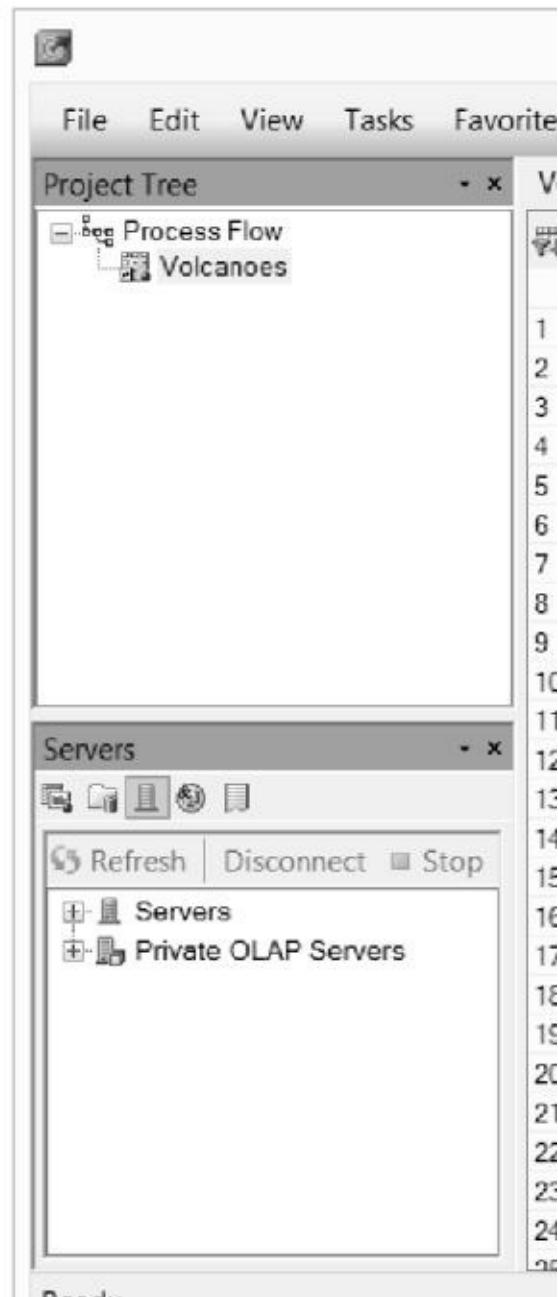


Click Open.



## 80 *The Little SAS Enterprise Guide Book*

After you open the Volcano



Ready

## Opening the Query

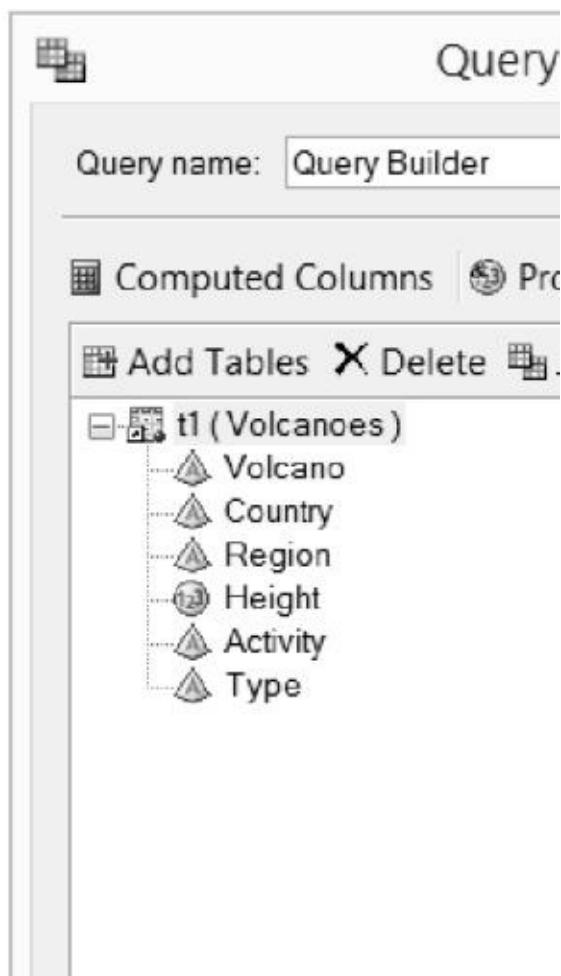
manipulation. In the Que  
join tables. To open the C  
the Volcanoes data table.

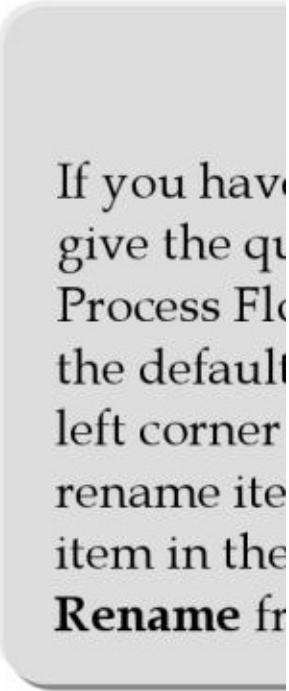
The screenshot shows the Microsoft Access interface. On the left, there is a 'Workspace Toolbar' with the text 'Click Query Builder'. On the right, a 'Volcanoes' query builder window is open. The window has a 'Filter and Sort' button and a 'Query Builder' button, which is highlighted with a cursor. Below these are two columns: 'Volcano' and 'Country'. A table lists six rows of data:

	Volcano	Country
1	Altar	Ecuador
2	Arthur's Seat	UK
3	Barren Island	India
4	Elbrus	Russia
5	Erebus	
6	Etna	Italy



The Query Builder window contains a toolbar, a menu bar, a status bar, a pane for displaying tables and columns, a pane for displaying the query results, and a pane for displaying the query definition. The toolbar includes icons for opening, saving, printing, and other common database operations. The menu bar includes options such as File, Edit, View, Tools, and Help. The status bar displays information about the current state of the application. The pane for displaying tables and columns shows a list of tables and their columns, along with various tools for managing them. The pane for displaying the query results shows the results of the current query. The pane for displaying the query definition shows the SQL code for the current query.





If you have give the qu Process Flo the default left corner rename ite item in the **Rename** fr



## Selecting columns

on the left and drag it over to select all the columns except the whole group at once by clicking Activity. Drag th

The screenshot shows the SAS Query Builder interface. At the top, there's a toolbar with icons for New, Open, Save, and others. Below the toolbar, the title bar says "Query". In the main area, there's a "Query name:" field containing "Query Builder". Underneath, there's a section titled "Computed Columns" with a "P" icon. A large tree view shows a table named "t1 (Volcanoes)" expanded, revealing its columns: Volcano, Country, Region, Height, Activity, and Type. To the right of the tree view, there are buttons for "Add Tables" (with a plus sign), "Delete" (with a minus sign), and a grid icon.



Click **Run** to see the resu

**Alt**

In addition,  
double click  
double click  
Select I  
click an



When you run the query,  
The new data table is given  
location. The data table is  
the Volcanoes data table.

The screenshot shows the 'Query Builder' interface. On the left, there is a 'Workspace Toolbar' with the text 'Click Modify Task'. The main area displays a data table titled 'Volcano' with the following rows:

	Volcano	Court
1	Altar	Ecuador
2	Arthur's Seat	UK
3	Barren Island	India
4	Elbrus	Russia
5	Erebus	
6	Etna	Italy
7	Fuji	Japan
8	Garibaldi	Canada
9	Grimsvotn	Iceland
10	Illimani	Bolivia

To make changes to the q  
results.

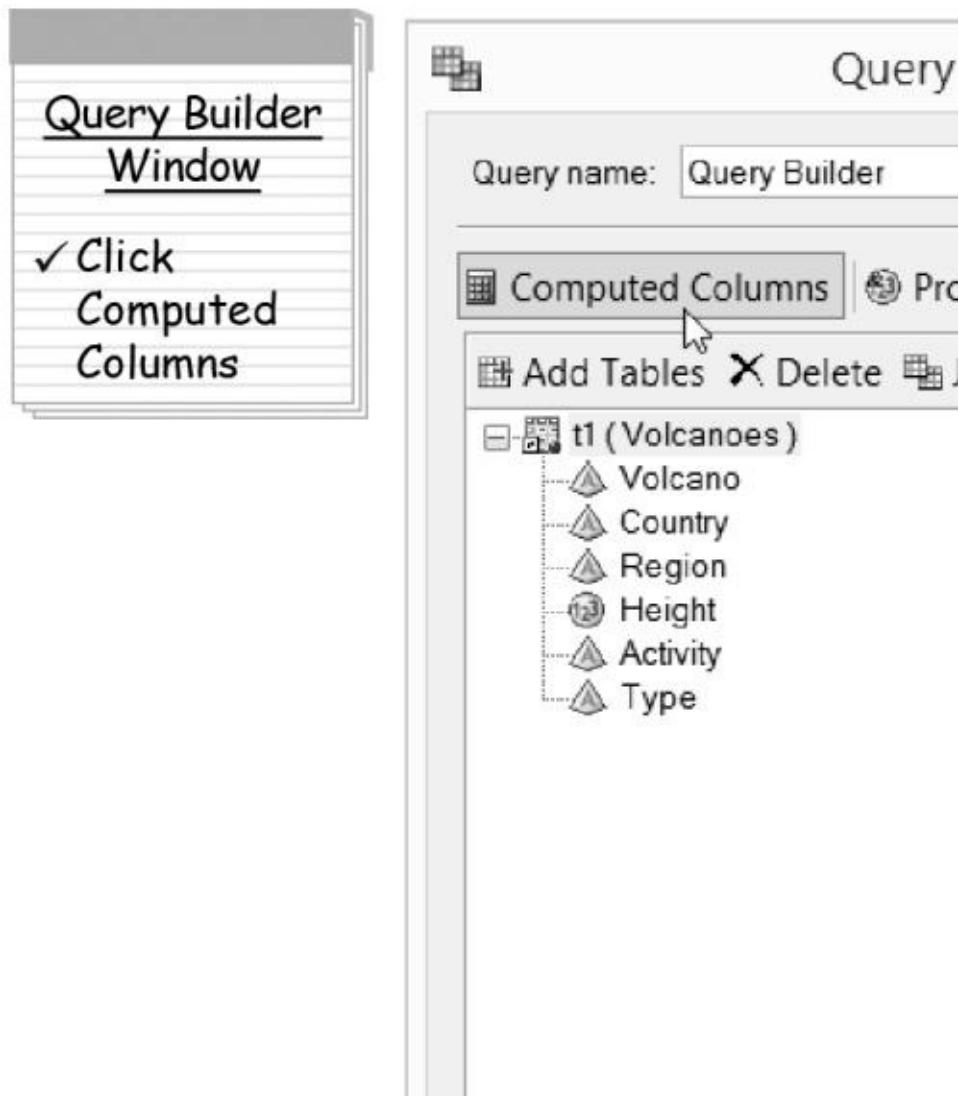
## Specifying

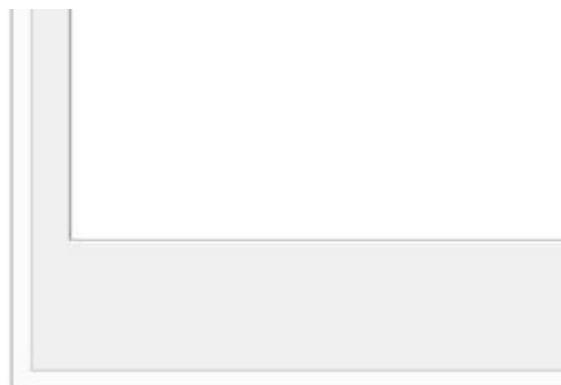
In this example, we will learn how to specify the output location for a query. If you want to specify a different output location for your results, follow the steps below. In the upper right corner of the Query Editor window, click the Output Name button. From the dropdown menu, select the report you want to run. From the Report menu in the Query Options dialog box, choose the corresponding report.



## **Creating a new column**

values in an existing column contains the height of each values in the Height column





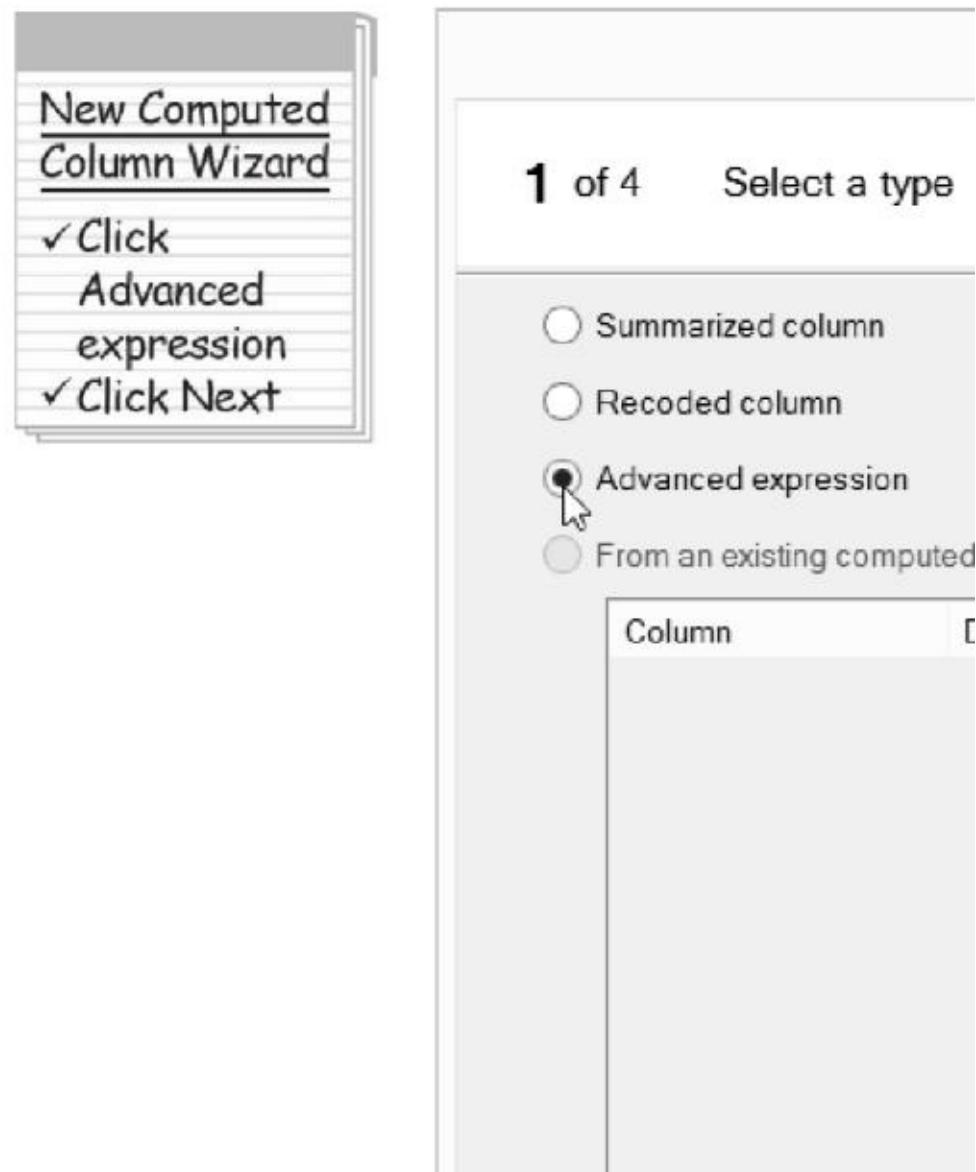
To create a new column t  
opens the Computed Col  
edit, delete, or rename ex

The image shows two windows side-by-side. The left window is titled 'Computed Columns Window' and contains a button labeled 'Click New'. The right window is titled 'Details' and has a single row with two columns: 'Column' and 'Details'. At the bottom of this window, there is a checked checkbox labeled 'Add new computed columns to'.

To create a new compute



This opens the New Computed Column Wizard. It has four steps. The first step is to Select a type of column. It gives you four choices: Summarized column, Recoded column, Advanced expression, and From an existing computed column.





Click **Next**.

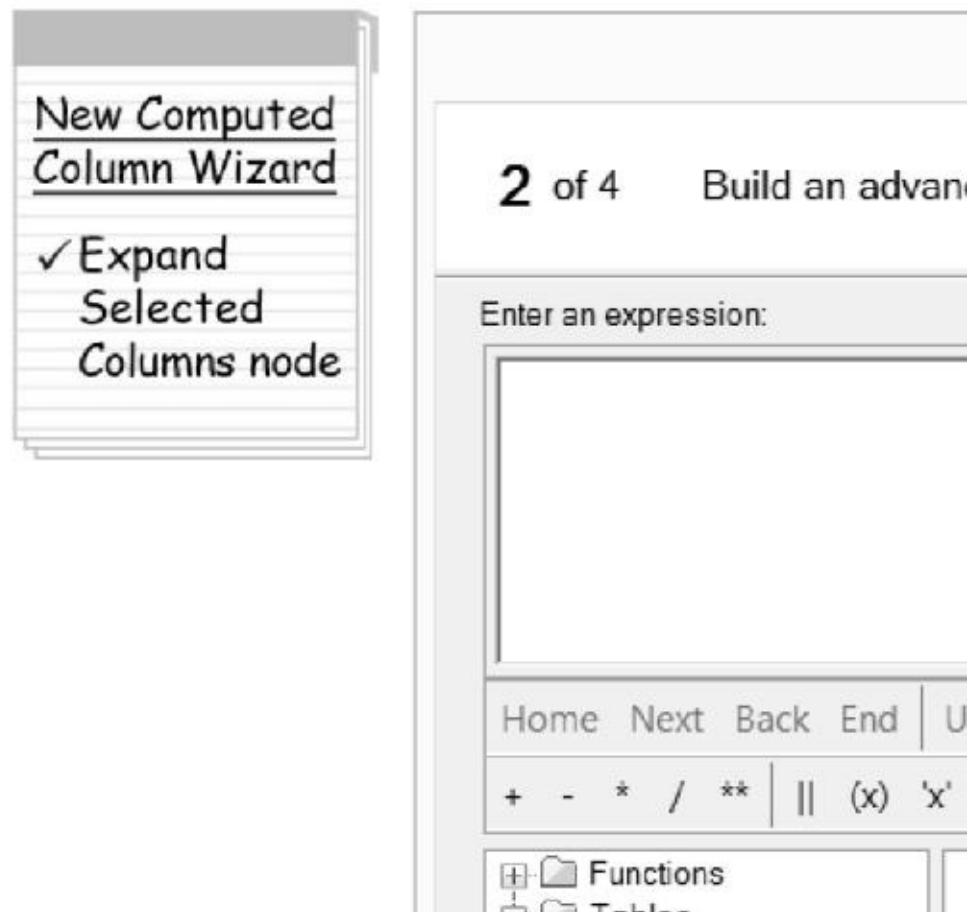
## What Is a Summarized Column?

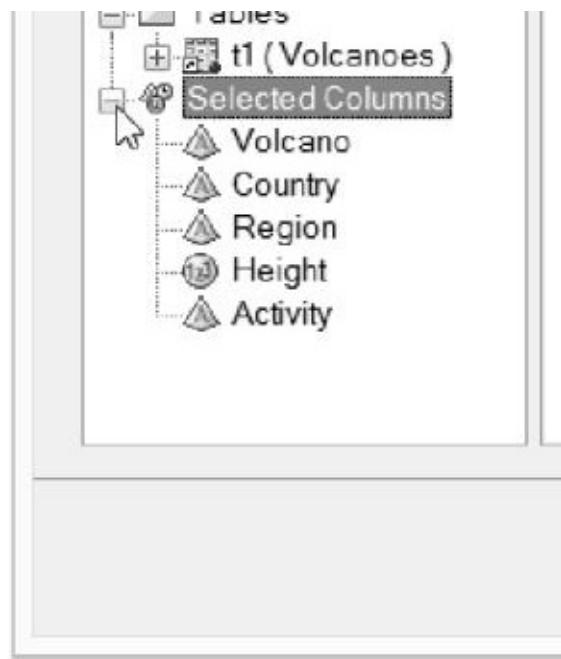
Use the **Summarized** option when you want a summary statistic such as minimum, sum, or count for a column. By default, the statistic is produced for each summarized column in combination of all other columns in the query. To specify which columns to use for statistics, use the **Summarized** area of the Query Builder located on the Select



## 86 *The Little SAS Enterprise Guide Boo*

The next window is where the expression is built. This window is where the expression is built. You can type it directly if you know what it should look like, you can click on the various mathematical symbols or click on the folders for Functions and Columns node by clicking on the icons.





If you are using the SAS Functions value, a function of that available arithmetic



To calculate the volcano's Height  
Double-click **Height** in the Height column is inserted  
name, t1.Height, includes

The screenshot shows two windows side-by-side. On the left is the 'New Computed Column Wizard' window, which has a title bar and a main area containing the text: 'Double-click Height'. On the right is the 'Expression Builder' window, which has a title bar '2 of 4 Build an advanced expression' and a main area with a text input field containing 't1.Height'. Below the input field is a toolbar with buttons for arithmetic operations (+, -, \*, /, \*\*), logical operators (||), and parentheses ((x) 'x'). At the bottom of the window is a tree view showing the structure of the current query:

- Functions
- Tables
  - t1 (Volcanoes)
- Selected Columns
  - Volcano
  - Country

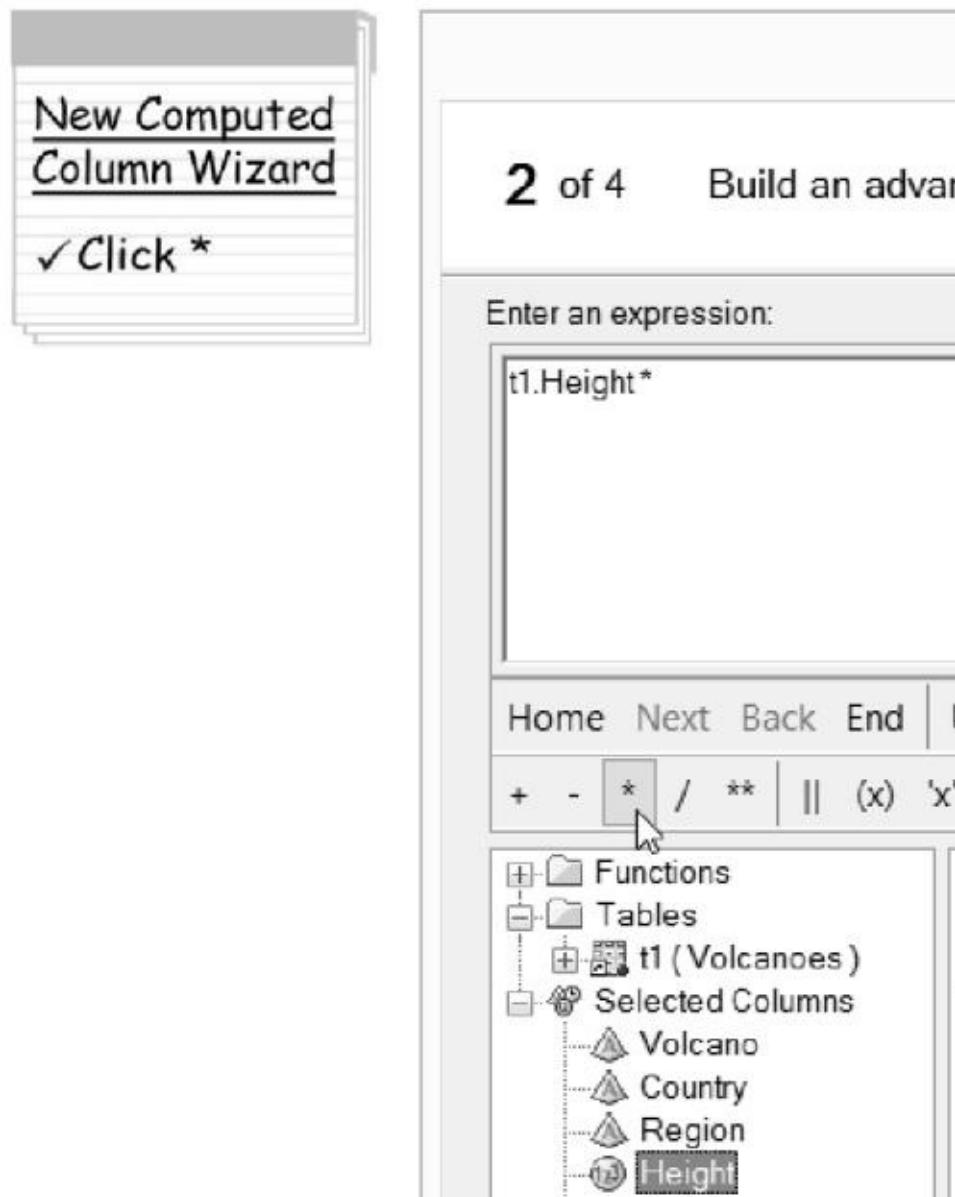


When you right-click on a table, it gives the table alias t1. If you right-click on the second table, it gives the alias t2. You can see both of these aliases in the context menu. This is useful for showing the table alias in the query. You can change the table alias for each table in the context menu. You can also do this in the Query Builder.



## 88 The Little SAS Enterprise Guide Boo

Now, under the box label  
Notice that the asterisk is



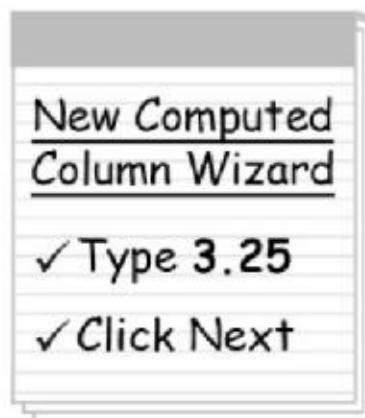
 **Activity**

---

---



To complete the expression, add an asterisk.



The screenshot shows the 'Build an advanced expression' section of the Expression Builder. The expression 't1.Height \* 3.25' is entered in the 'Enter an expression:' text box. Below the text box is a toolbar with operators: +, -, \*, /, \*\*, ||, (x), 'x'. At the bottom is a navigation bar with Home, Next, Back, End, and a list of available functions and tables: Functions, Tables, t1 (Volcanoes), Selected Columns, Volcano, Country, Region, Height.

2 of 4 Build an advanced expression

Enter an expression:

t1.Height \* 3.25

Home Next Back End | U

+ - \* / \*\* | || (x) 'x'

Functions  
Tables  
t1 (Volcanoes)  
Selected Columns  
Volcano  
Country  
Region  
Height

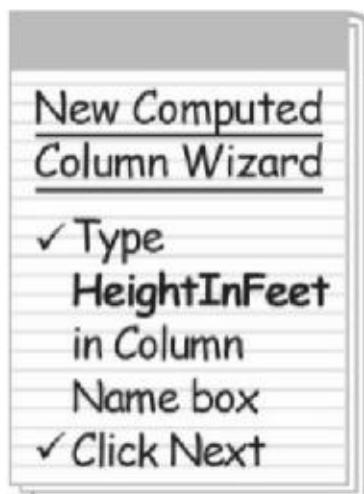
 Activity

Click **Next**.



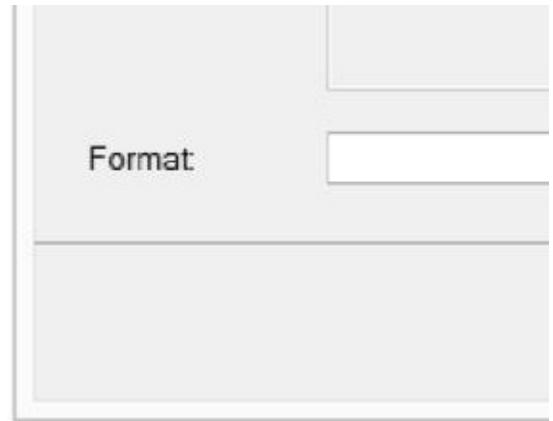
## 90 The Little SAS Enterprise Guide Boo

Notice that the column has a name, but it is better to give the column a descriptive name like HeightInFeet.



3 of 4      Modify additional properties

Column Name:	HeightInFeet
Label:	
Summary:	NONE
Expression:	t1.Height * 3.25



Click **Next**.



The final window of the  
new computed column.



**4** of 4      Summary of p

Column Name: HeightInFeet  
Label: Default  
Format: Default  
Length: Default  
Summary: None  
Expression:  
`t1.Height * 3.25`



Click **Finish** to return to the table.



Column	Details
<input checked="" type="checkbox"/> HeightInFeet	t1.Height * 3.28084

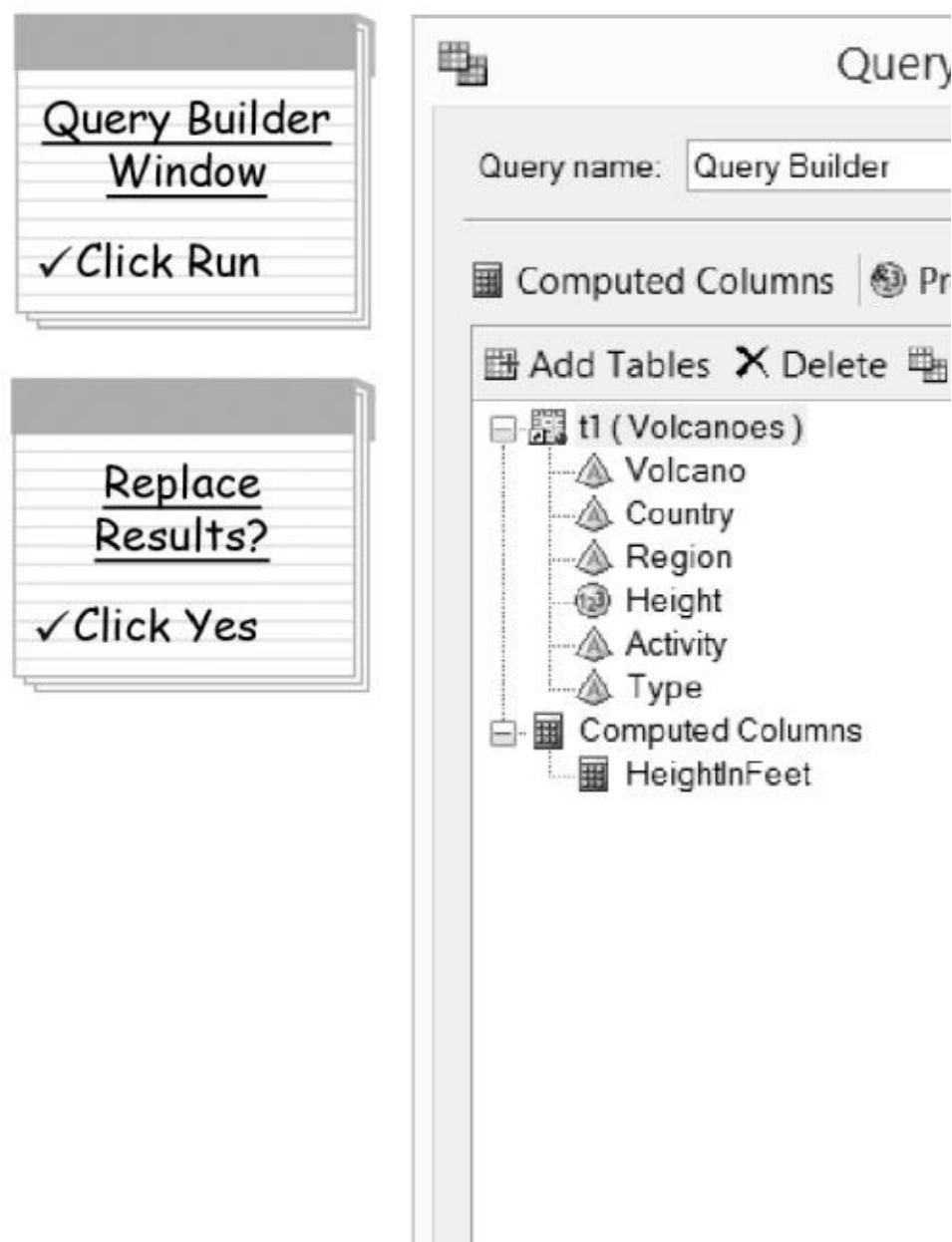
Add new computed columns to this table

Click **Close**.



## 92 The Little SAS Enterprise Guide Boo

Notice that the new colour  
Data tab as well as under





Click **Run** to view the results.  
Enterprise Guide asks if you want to



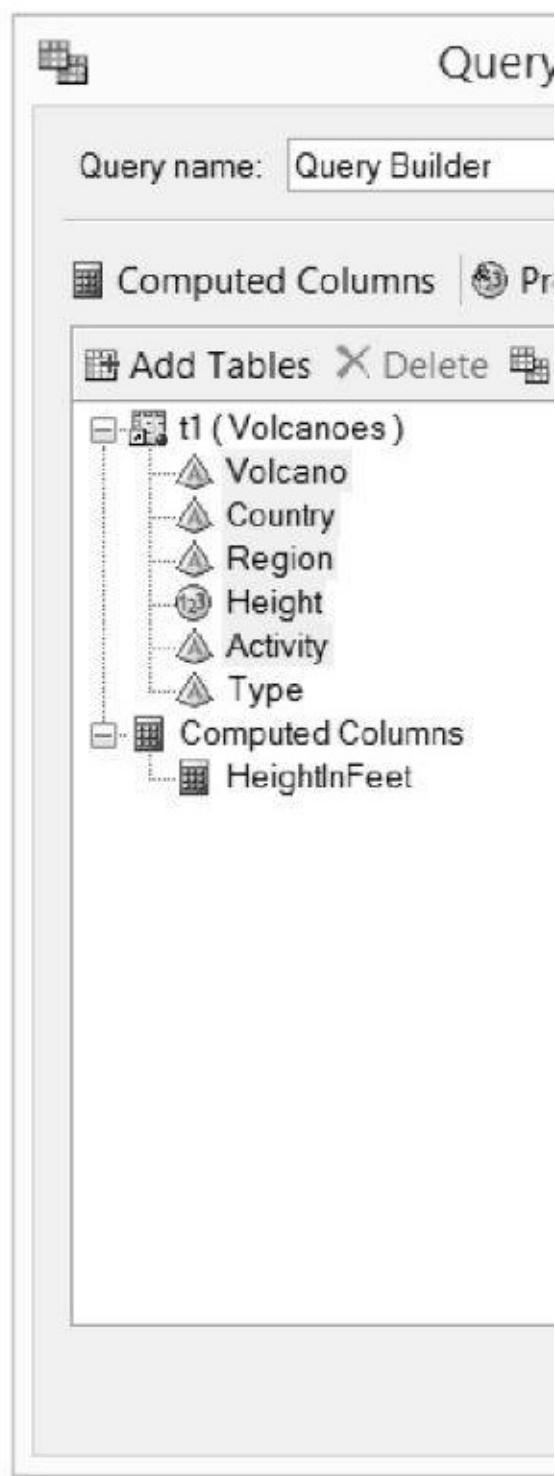
The values for HeightInF  
necessary to show fractio  
to make them easier to re

The screenshot shows a software interface with a 'Workspace Toolbar' at the top left. The toolbar includes a 'Modify Task' button, which is highlighted with a yellow background and a black border. To the right of the toolbar is a 'Query Builder' window. The window has tabs for 'Input Data', 'Code', and 'List'. The 'List' tab is active, displaying a table of 10 volcano entries. The table columns are labeled 'Volcano' and 'Country'. The first entry, 'Altar', is selected, as indicated by a yellow background and a black border around its row.

	Volcano	Country
1	Altar	Ecuador
2	Arthur's Seat	UK
3	Barren Island	India
4	Elbrus	Russia
5	Erebus	
6	Etna	Italy
7	Fuji	Japan
8	Garibaldi	Canada
9	Grimsvotn	Iceland
10	Illimani	Bolivia

Click **Modify Task** on th

To change the display for  
the column. Click **Height**



Then click the Properties



## 94 The Little SAS Enterprise Guide Boo

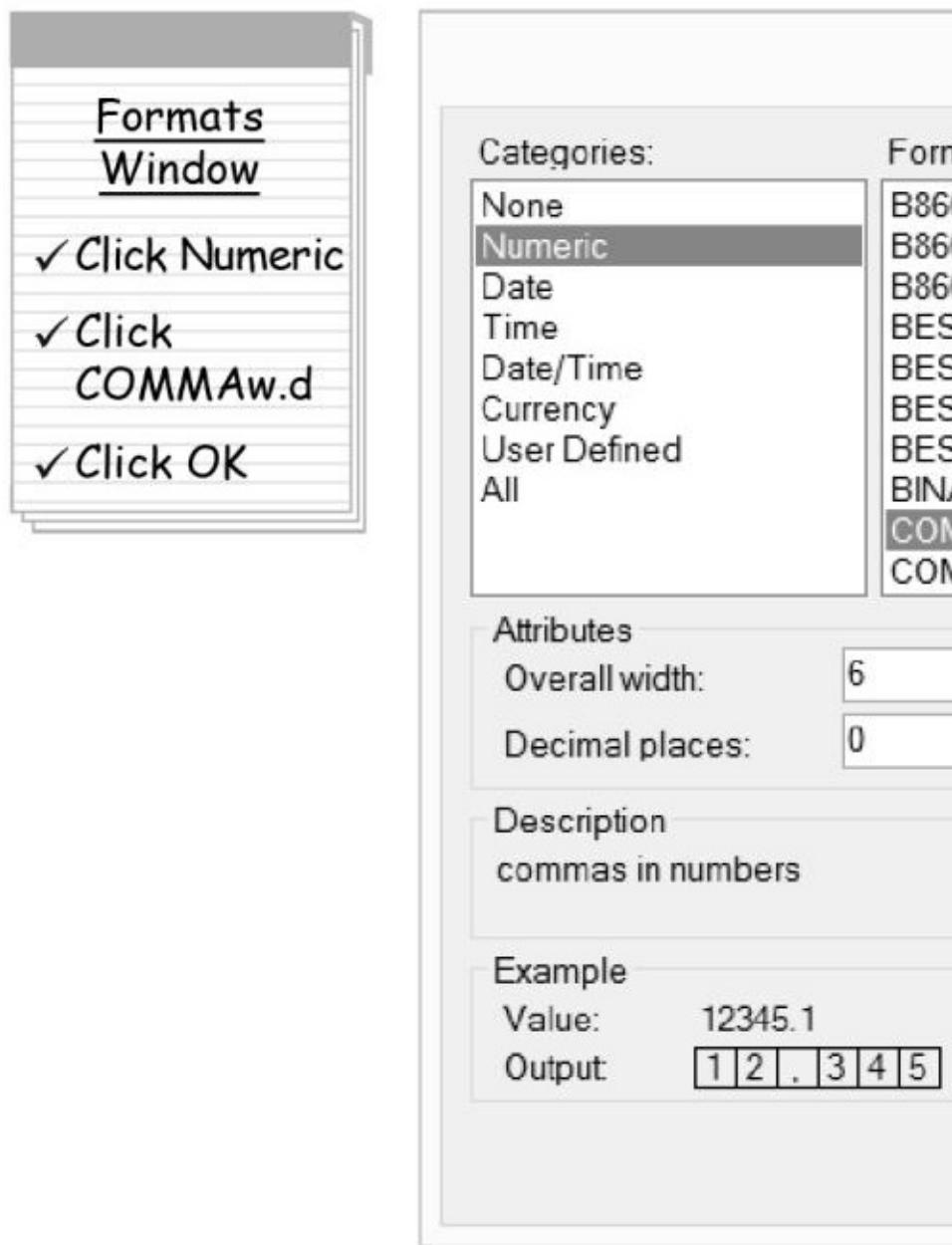
The HeightInFeet column

The image shows a 'Properties Window' dialog box. On the left, there is a vertical list of properties: Column Name, Label, Format, Summary, Expression, and Source Column. To the right of each property is a text input field. The 'Column Name' field contains 'HeightInFee'. The 'Label' field is empty. The 'Format' field is empty. The 'Summary' field contains 'None'. The 'Expression' field contains the formula 't1.Height \* 3.'. The 'Source Column' field contains 'Computed'.

Column Name:	HeightInFee
Label:	
Format:	
Summary:	None
Expression:	t1.Height * 3.
Source Column:	Computed

Click **Change**. This opens the **COMMAND** and **FORMAT** tabs.

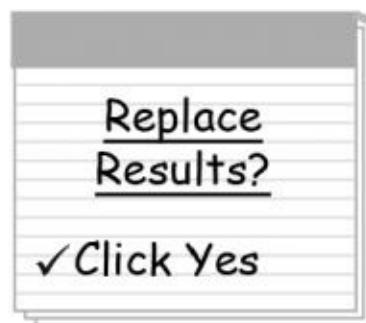
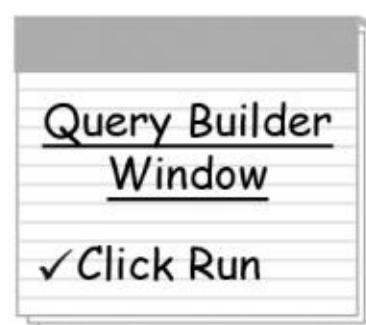
the **COMMAw.d** format  
column because the height  
Make sure that the number



Click **OK** to return to the



Now the format for the computed column is set. Click OK to close the Properties window.



Column Name:	HeightInFeet
Label:	
Format:	COMMA6.
Summary:	None
Expression:	t1.Height * 3.2
Source Column:	Computed

Click **OK**, then click **Run** to see the results.

format for the next time  
replace the previous resu

The screenshot shows a software interface with a 'Workspace Toolbar' on the left and a 'Query Builder' window on the right.

**Workspace Toolbar:**

- Icon: Checkmark
- Text: Click Modify Task

**Query Builder:**

Input Data | Code | Log

Modify Task | Filter

	Volcano	Country
1	Altar	Ecuador
2	Arthur's Seat	UK
3	Barren Island	India
4	Elbrus	Russia
5	Erebus	
6	Etna	Italy
7	Fuji	Japan
8	Garibaldi	Canada
9	Grimsvotn	Iceland
10	Illimani	Bolivia

To make more changes to



**Ordering and removing columns**  
you no longer need the Height column  
clicking **Height** in the list

The screenshot shows the SAS Query Builder interface. On the left, a window titled "Query Builder Window" contains two items:

- ✓ On Select Data tab, click Height
- ✓ Click Delete icon

On the right, the main "Query" window displays the following details:

- Query name: Query Builder
- Computed Columns: None
- Add Tables: t1 (Volcanoes)
- Table Structure:
  - t1 (Volcanoes)
    - Volcano
    - Country
    - Region
    - Height
    - Activity
    - Type
  - Computed Columns
    - HeightInFeet

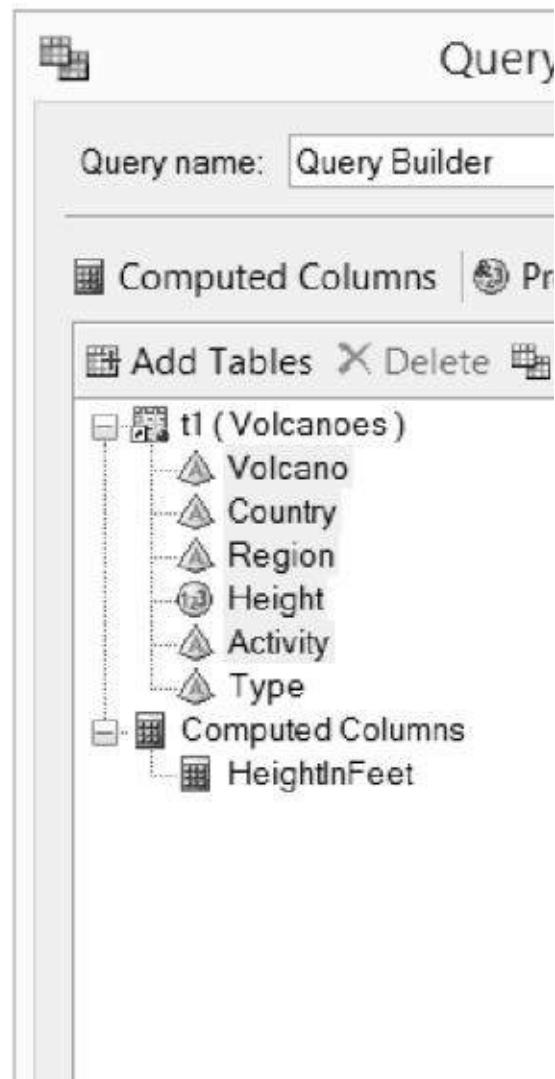


Then click the Delete icon  
important to note that de  
column from the original



In the results, the column  
Builder. You can change

**HeightInFeet** and then cl  
Builder window until the





Click **Run** to view the results  
replace the previous results.  
Activity and the Height column.

**Workspace Toolbar**

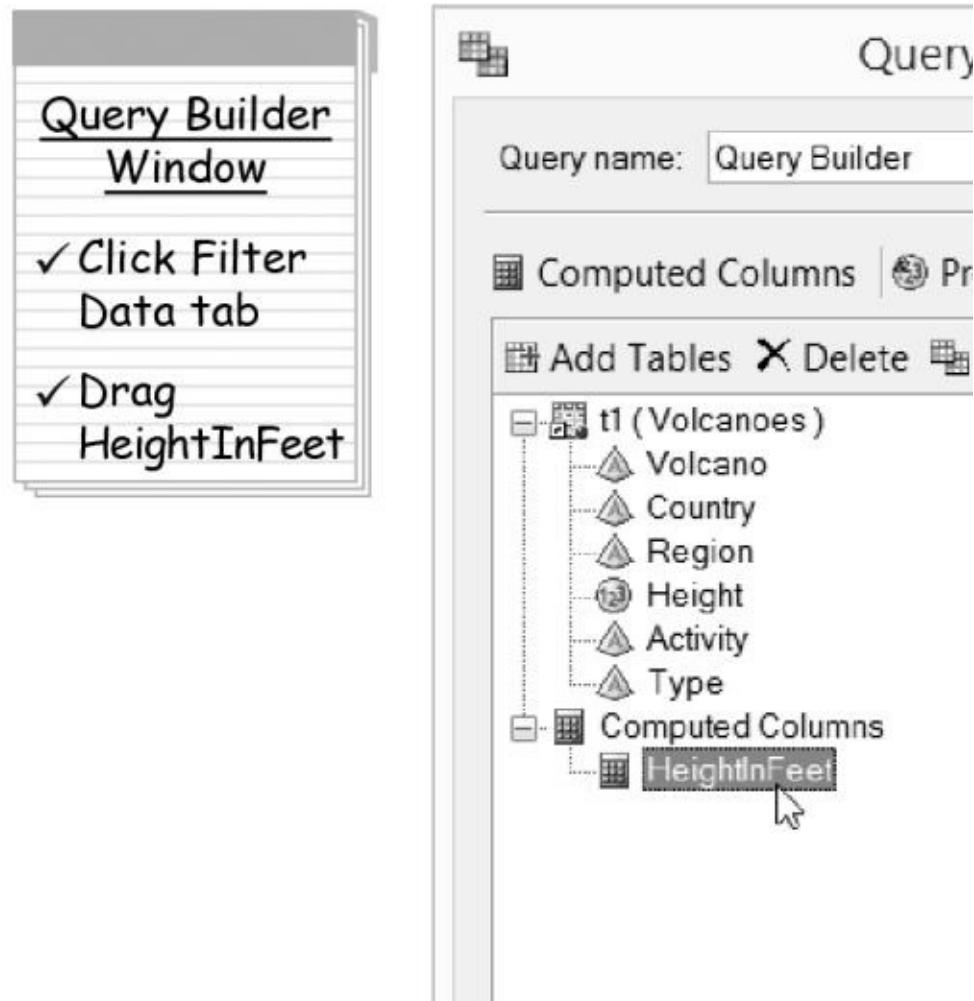
✓ Click Modify Task

	Volcano	Country
1	Altar	Ecuador
2	Arthur's Seat	UK
3	Barren Island	India
4	Elbrus	Russia
5	Erebus	
6	Etna	Italy
7	Fuji	Japan
8	Garibaldi	Canada
9	Grimsvotn	Iceland
10	Illimani	Bolivia

To make more changes to



**Filtering data** To filter data, click the **Add Tables** button in the Query Builder. Click the **HeightInFeet** column that you want to filter. For example, use the HeightInFeet column to filter for volcanoes taller than 12,000 feet.





Click the **HeightInFeet** column header to open the  
**Filter Data** tab.

In addition to filtering by height, you can filter by location. To do this, click the **Location** column header to open the **Filter Data** tab. From there, you can filter by location using the **Location** dropdown menu. You can also filter by location using the **Location** column header's dropdown menu. This will filter the data grid to show only the rows that contain the selected location.



As soon as you release the filter is automatically

1 of 2 Build a basic f

Source Column:	Computed
Column Name:	HeightInFee
Operator:	Equal to
<input type="checkbox"/> Generate filter for a prompt	
Value:	
(CALCULATED HeightInFee) =	

Enclose values in quotes



## 100 The Little SAS Enterprise Guide Bo

Because you want all volcano heights greater than 12,000 feet, choose the Greater than operator. Click the down arrow to see more operators. Select the **Greater than** operator. When you enter numbers, they must be separated by commas.

The screenshot shows two panels of the New Filter Wizard. The left panel, titled 'New Filter Wizard', lists the following steps:

- ✓ From Operator list, select Greater than
- ✓ In Value box, type 12000
- ✓ Click Next

The right panel, titled '1 of 2 Build a basic filter', displays the configuration:

Source Column:	Computed
Column Name:	HeightInFeet
Operator:	Greater than
<input type="checkbox"/> Generate filter for a prompt	
Value:	12000
(CALCULATED HeightInFeet) > 12000	

Enclose values in quotes

Click **Next** to display a si





2 of 2      Summary of pr

---

Source Column: Computed  
Column Name: HeightInFeet  
Type: Basic  
Filter:  
WHERE (CALCULATED HeightInFt >= 10)

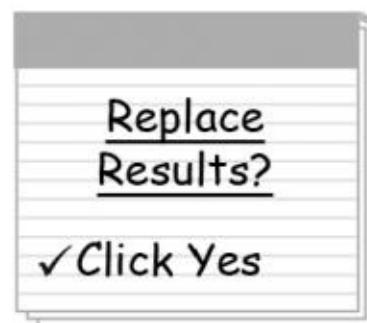
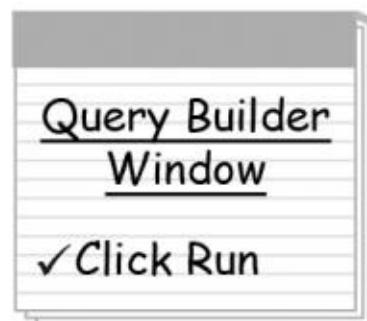


Click **Finish**.



## 102 The Little SAS Enterprise Guide Bo

Now the Filter Data tab s

A screenshot of the Query Editor window. The title bar says "Query". The "Query name:" field is set to "Query Builder". Below it are tabs for "Computed Columns" and "Pre". A toolbar with "Add Tables" (with a plus sign), "Delete" (with a minus sign), and other icons is visible. The main pane shows the table structure of "t1 (Volcanoes)".

- t1 (Volcanoes)
  - ↳ Volcano
  - ↳ Country
  - ↳ Region
  - ↳ Height
  - ↳ Activity
  - ↳ Type
- Computed Columns
  - ↳ HeightInFeet



Click **Run** in the Query B  
replace the previous resu

Now you can see that all

The screenshot shows a software interface titled "Query Builder". At the top, there is a toolbar with several icons: "Input Data", "Code", "Loc", "Modify Task" (which has a mouse cursor pointing at it), and "Filter". Below the toolbar is a table with 11 rows, each containing a number, a volcano name, and its location. The first row, "Altar", is highlighted with a red border. The table data is as follows:

	Volcano	Country
1	Altar	Ecuador
2	Elbrus	Russia
3	Erebus	
4	Fuji	Japan
5	Illimani	Bolivia
6	Kenya	Kenya
7	Kilimanjaro	Tanzania
8	Kliuchevskoi	Russia
9	Mauna Loa	USA
10	Popocatepetl	Mexico
11	Sabancaya	Peru

You can create more com  
**Modify Task** on the wor



Click the **Filter Data** tab in the ribbon to filter to create a data table.



Query

Query name: Query Builder

Add Tables    X Delete    J

- t1 (Volcanoes)
  - ▲ Volcano
  - ▲ Country
  - ▲ Region
  - ② Height
  - ▲ Activity
  - ▲ Type
- Computed Columns
- HeightInFeet



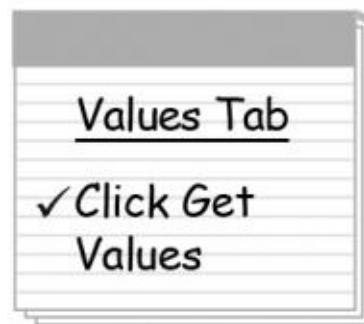
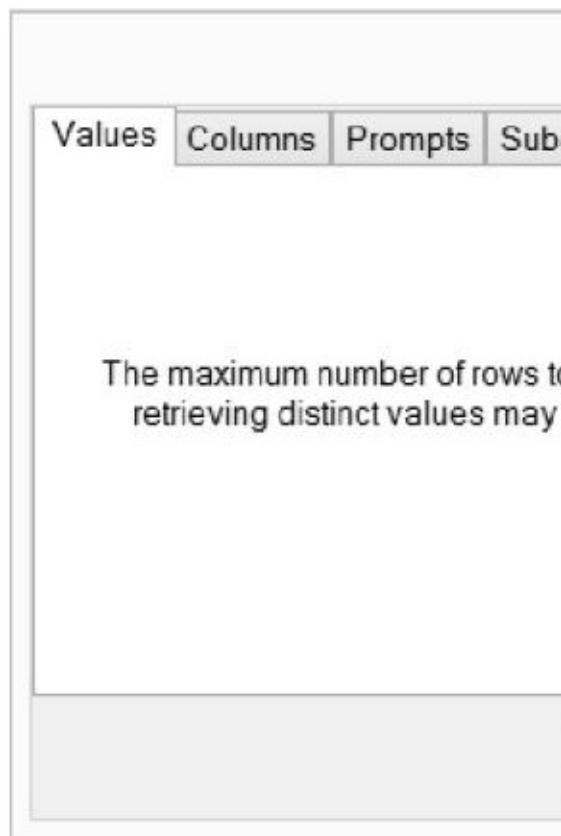
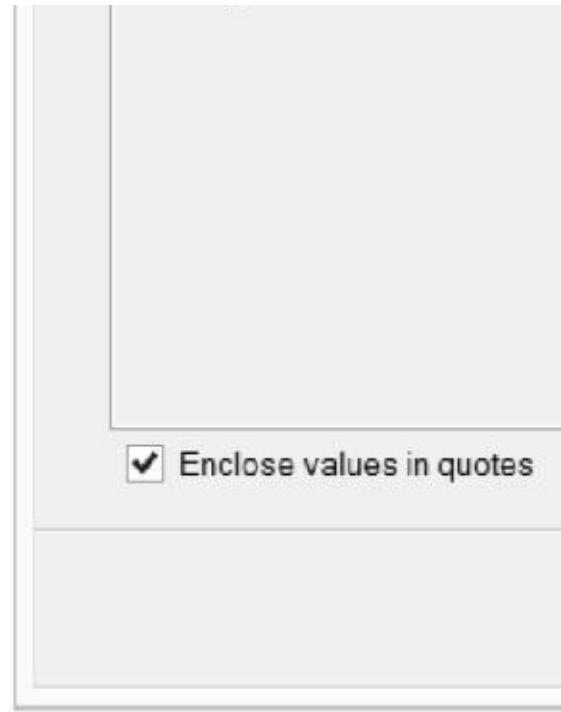
Click the column **Activity**



When you release the mouse button, no need to change the operator from equals Active. At this point, the casing of the letters) in the Value column of the list gives you the option to choose a value from a list has the advantage of being lowercase where it should be. As it may take a long time to

The screenshot shows the 'New Filter Wizard' interface. On the left, a note says: '✓ Click down-arrow next to Value box'. The main panel displays the first step of the wizard: '1 of 2 Build a basic filter'. It includes fields for 'Source Column' (set to 't1.Activity'), 'Column Name' (set to 'Activity'), and 'Operator' (set to 'Equal to'). Below these, there is a checkbox labeled 'Generate filter for a prompt' which is unchecked. At the bottom, there is a 'Value:' field containing the expression 't1.Activity = "'.

Source Column:	t1.Activity
Column Name:	Activity
Operator:	Equal to
<input type="checkbox"/> Generate filter for a prompt	
Value:	t1.Activity = "



Click **Get Values** to load



The Activity column has **Active** in the list of values.

The screenshot shows the 'Values' tab of a dialog box. At the top, there are tabs labeled 'Values', 'Columns', 'Prompts', and 'Sub'. Below the tabs, there is a table with two columns: 'Value' and 'Format'. The first row contains the value 'Active' in the 'Value' column and 'Active' in the 'Format' column. A cursor arrow points to the 'Active' value in the 'Value' column. The second row contains the value 'Extinct' in both the 'Value' and 'Format' columns. There are two empty rows below these.

Value	Format
Active	Active
Extinct	Extinct

The window will close, and a new window. Because these are located at the bottom of the screen.

The screenshot shows the 'New Filter Wizard' dialog box. At the top, it says 'Step 1 of 2: Build a basic filter'. The main area is currently empty, showing a large white space.

 ✓ Click Next

Source Column: t1.Activity

Column Name: Activity

Operator: Equal to

Generate filter for a prompt

Value: Active

t1.Activity = 'Active'

Enclose values in quotes

Click **Next** to display a s



## 106 The Little SAS Enterprise Guide Bo

2 of 2 Summary of pr

Source Column: t1.Activity  
Column Name: Activity  
Type: Basic  
Filter:  
WHERE t1.Activity = 'Active'





Click **Finish**.



Notice that a new condition has been added to the WHERE clause.

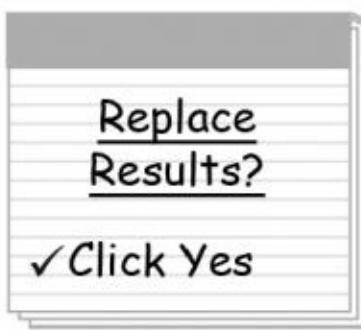
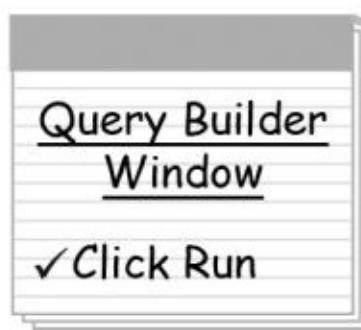
The screenshot shows the Microsoft Query Builder interface. At the top, there's a toolbar with icons for Open, Save, Print, and others. The title bar says "Query". Below the toolbar, the "Query name:" field contains "Query Builder". There are tabs for "Computed Columns" and "Pro". A button bar below the tabs includes "Add Tables" (with a plus sign), "Delete" (with a minus sign), and other icons. The main pane displays a tree view of the "t1 (Volcanoes)" table structure. The table has columns: Volcano, Country, Region, Height, Activity, and Type. The "Activity" column is highlighted with a dark gray background. Underneath the table node, there's a "Computed Columns" node which contains a single item: "HeightInFeet".



If you wanted to change the condition to reopen the E

and click the Edit Filter icon.

Click **Run** in the Query Builder to replace the previous results.



In this example, the condition is the volcano operator seeker, and either exactly one filter, using AND to connect the first two filters of the Query list.



## 108 The Little SAS Enterprise Guide Bo

Notice that all the volcan

The screenshot shows the SAS Enterprise Guide interface. On the left, a vertical workspace toolbar has a button labeled "Click Modify Task" with a checkmark. To the right is the Query Builder window, which contains a toolbar with tabs for Input Data, Code, and Location, and buttons for Modify Task, Filter, and Sort. Below the toolbar is a table with six rows of volcano data. The first row, "Erebus", is selected, highlighted with a black border. The data columns are Volcano (listing names like Erebus, Fuji, Kliuchevskoi, Mauna Loa, Popocatepetl, and Sabancaya) and Country (listing Japan, Russia, USA, Mexico, and Peru). The table has a header row with icons for sorting.

Volcano	Country
Erebus	
Fuji	Japan
Kliuchevskoi	Russia
Mauna Loa	USA
Popocatepetl	Mexico
Sabancaya	Peru

To make more changes to

**Sorting the data rows**  
sorted alphabetically by the height of the volcanoes by height, show click the **Sort Data** tab.



Query name: Query Builder

Add Tables Delete

- t1 (Volcanoes)
  - Volcano
  - Country
  - Region
  - Height
  - Activity
  - Type
- Computed Columns
  - HeightInFeet

Click and drag the HeightInFeet column to the sort data tab.



Initially, the sort direction is set to Ascending. Change this so that the tallest volcano appears at the top of the list by clicking the drop-down list.

The screenshot shows the Microsoft Query Builder window. At the top, it says "Query" and has a "Query name:" dropdown set to "Query Builder". Below that are buttons for "Computed Columns" and "Add Tables". The main area shows a tree view of the "t1 (Volcanoes)" table:

- Volcano
- Country
- Region
- Height
- Activity
- Type

Below the table node is a "Computed Columns" node, which contains a "HeightInFeet" column.

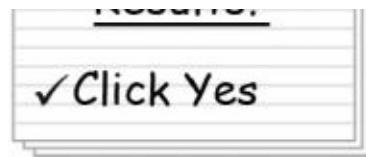
**Sort Data Tab**

- ✓ In Sort Direction box, click Ascending
- ✓ Select Descending

**Query Builder Window**

- ✓ Click Run

**Replace Results?**

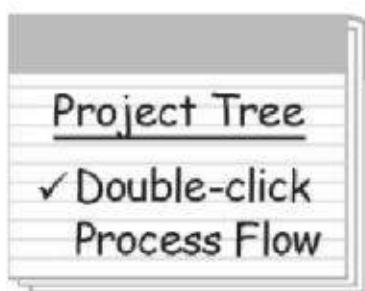


Click **Run** in the Query Bar to replace the previous results with the tallest

Query Builder ▾

	Volcano	Country
1	Sabancaya	Peru
2	Popocatepetl	Mexico
3	Kliuchevskoi	Russia
4	Mauna Loa	USA
5	Erebus	
6	Fuji	Japan





✓ Double-click  
Process Flow

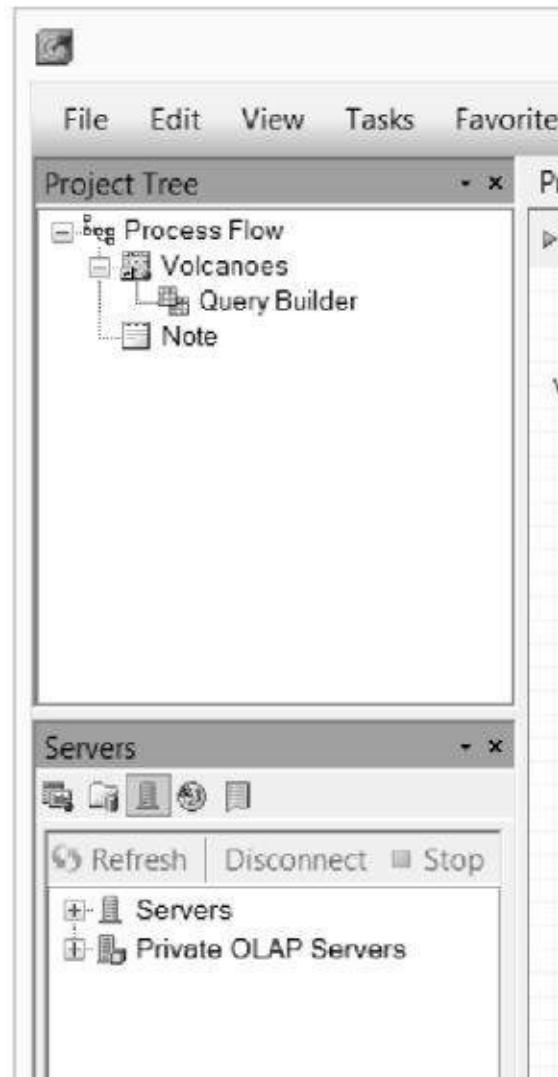


✓ Select  
File ► New ►  
Note



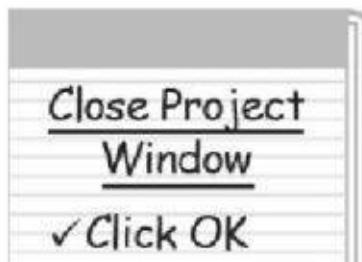
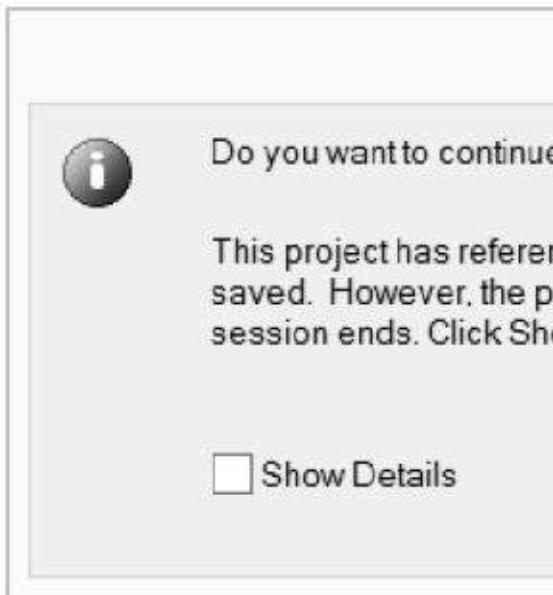
✓ Type  
descriptive  
text

**Completing the tutorial**  
project. Double-click the "Note" node in the Project Tree. From the menu bar, select File ► New ► Note from the menu bar. In the workspace, type descriptive text in the new note node.





Now save the project and menu bar. Navigate to the name **TutorialC**, and click Enterprise Guide. Because library by default, you must Guide. In this case, there location since you can eas



Click OK.

~~~~~









“ ‘One m

From *The Innocents Abroad; or, T*



D

## Joining Two Data Tab

Often the data you need for the analysis, you need to combine two data tables, and then we'll do that in this tutorial:

- Joining tables together
- Filtering data after joining
- Selecting which data to keep

**Before beginning this tutorial**  
which contains information about the Fire Tours data table, which contains information about the Ice Tours company. Both tables can be found in Appendix A.

The Fire and Ice Tours companies operate in South America and Europe. The problem is that they don't have a common column for the region of the volcano. This makes it difficult for the company to produce a single report that can be joined together.

### Desktop

- ✓ Double-click SAS Enterprise Guide icon

### Welcome Window

- ✓ Click New Project

**Starting SAS Enterprise Guide** by clicking the **SAS Enterprise Guide** from the Windows Start menu or desktop icon. This will bring the SAS Enterprise Guide window to the foreground. The Welcome window will appear, allowing you to select a project to open or start a new one.



W

Select one of these options:

#### **Open a project**

- (1) C:\FAI Tours\Projects\Tutorial1
- (2) C:\FAI Tours\Projects\Tutorial2
- (3) C:\FAI Tours\Projects\Tutorial3
- More projects ...

#### **New**

- New Project
- New SAS Log
- New Data

#### **Assistance**

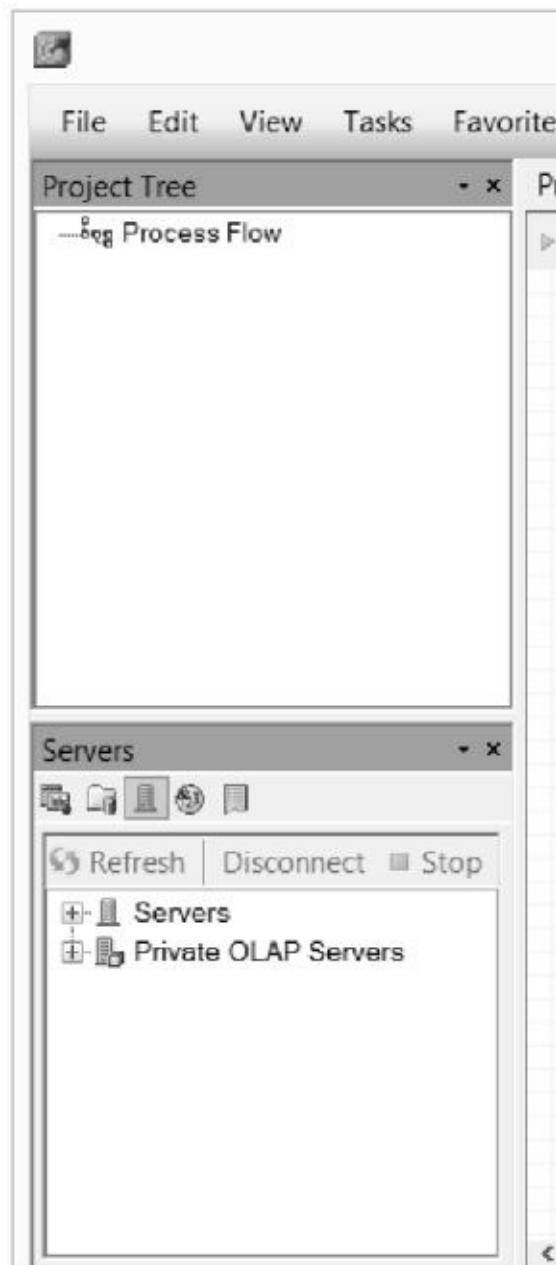
- Tutorial: Getting Started with SAS

Don't show this window again



## 114 The Little SAS Enterprise Guide Book

This opens an empty SAS



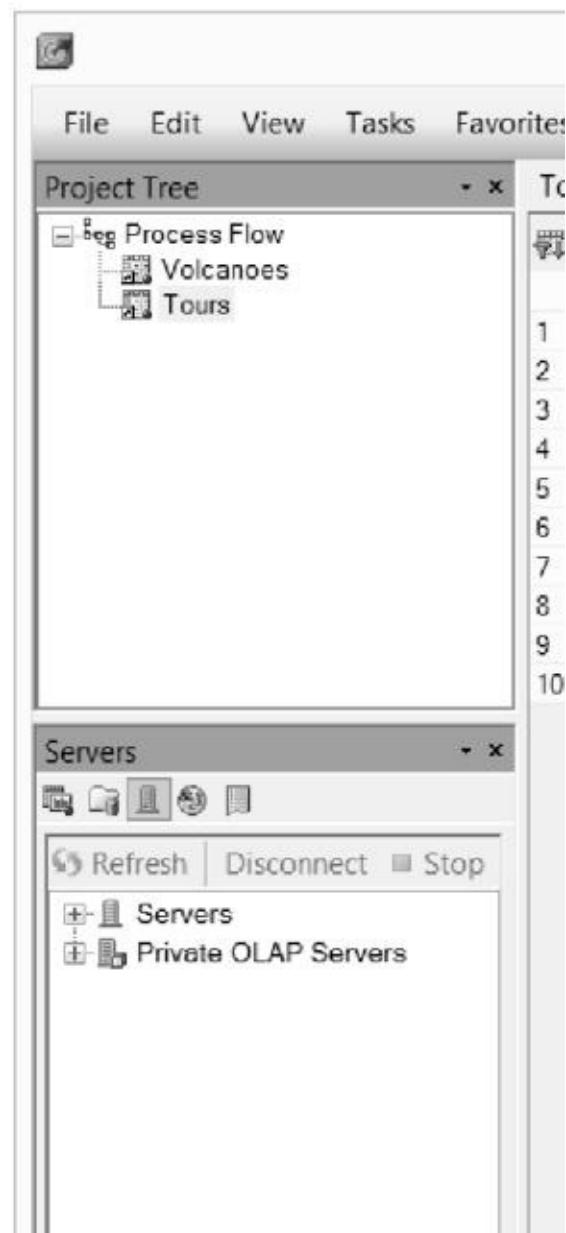
Ready



**Opening the two data tables by selecting **File ►** navigating to the location tables at once by clicking clicking the other table. ( saved it in the SASUSER **File ► Open ► Data** from library.)**



After opening both files,  
listed in the Project Tree.







Here is what the Tours data set looks like. It contains information about a tour: the name of the volcano, the country where it is located, the length of the tour, the price, and a difficulty rating. Notice that the data is sorted by the Volcano column. This is because the Tours data table, so it is sorted by the first column. You can sort the data by any column you want, such as the length of the tour or the price.

Tours ▾

Filter and Sort Qu

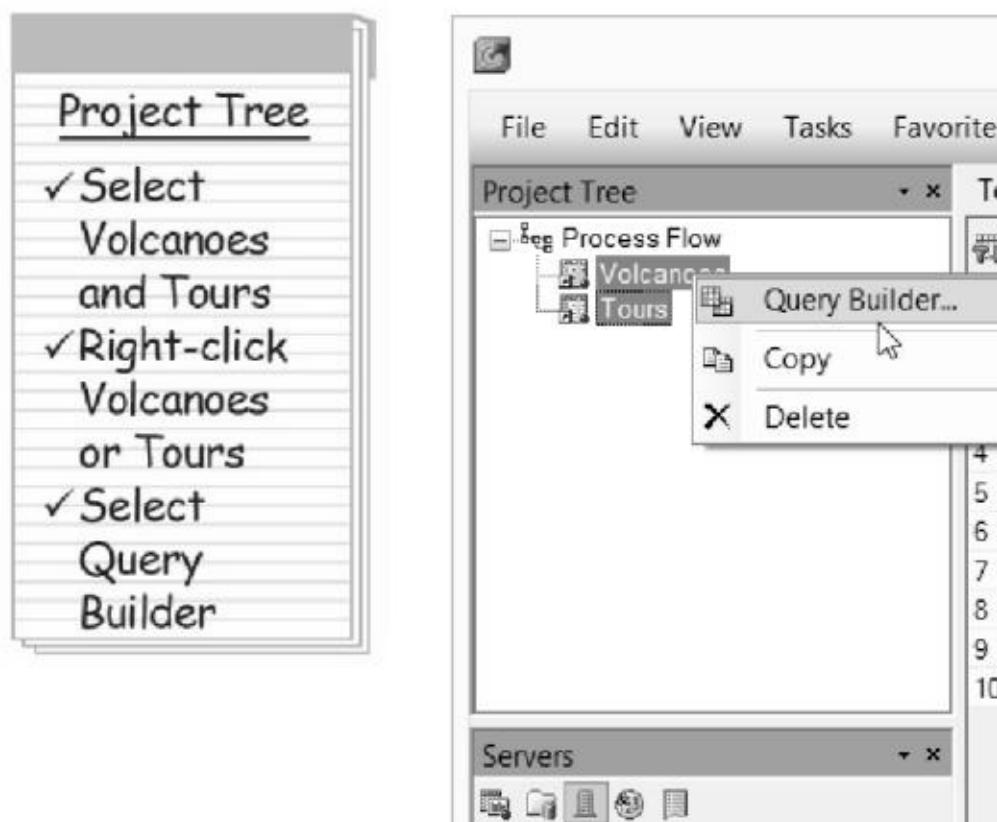
|    | Volcano     | Country    |
|----|-------------|------------|
| 1  | Etna        | Italy      |
| 2  | Fuji        | Japan      |
| 3  | Kenya       | Nairobi    |
| 4  | Kilauea     | Hawaii     |
| 5  | Kilimanjaro | Tanzania   |
| 6  | Krakatau    | Java       |
| 7  | Poas        | Costa Rica |
| 8  | Reventador  | Equador    |
| 9  | St. Helens  | Portland   |
| 10 | Vesuvius    | Italy      |

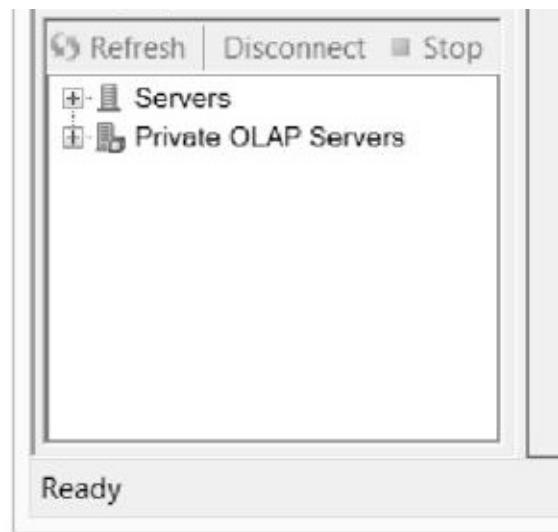
There is a partial listing of the region of the volcano, as the data tables contain different types of the volcano. To join data from two tables, at least one column that appears in both tables must have the same name in both tables and must have the same possible values.

| Volcanoes |               |         |
|-----------|---------------|---------|
|           | Volcano       |         |
| 1         | Altar         | Ecuador |
| 2         | Arthur's Seat | UK      |
| 3         | Barren Island | India   |
| 4         | Elbrus        | Russia  |
| 5         | Erebus        |         |
| 6         | Etna          | Italy   |
| 7         | Fuji          | Japan   |
| 8         | Garibaldi     | Canada  |
| 9         | Grimsvotn     | Iceland |
| 10        | Illimani      | Bolivia |
| 11        | Kenya         | Kenya   |
| 12        | Kilauea       | USA     |



**Joining tables** You can join two tables in addition to joining tables in a process flow. To join both tables simultaneously, hold the control (CTRL) key while selecting both Volcanoes and Tours, and select **Query Builder...** from the context menu. As you learned earlier in this chapter, this option is not available in the Enterprise Guide toolbar. Instead, open the Project Tree window and right-click either Volcanoes or Tours to open the context menu and select **Query Builder...** to open the Query Builder.

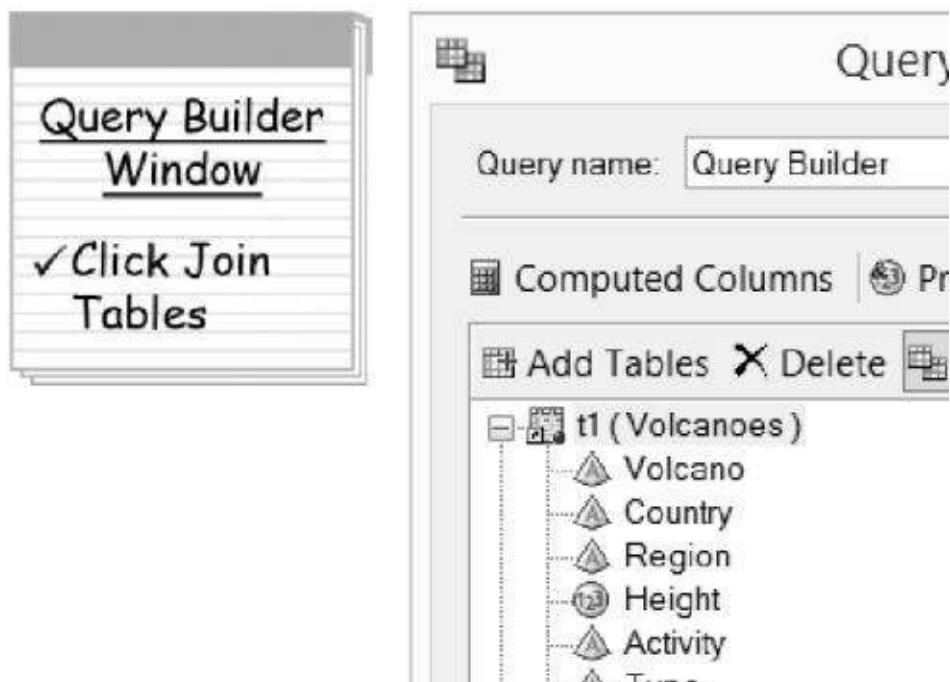






The Query Builder window has a toolbar at the top, addition, in the box on the left, and buttons for Add, Delete, and Join Tables. To the right of the toolbar are buttons for the columns in the data table.

When you have multiple data tables have a column that will be the same type (numerical or character), the Query Builder will automatically create a computed column and the Tours data table has one of these. The Query Builder will use it to find rows.





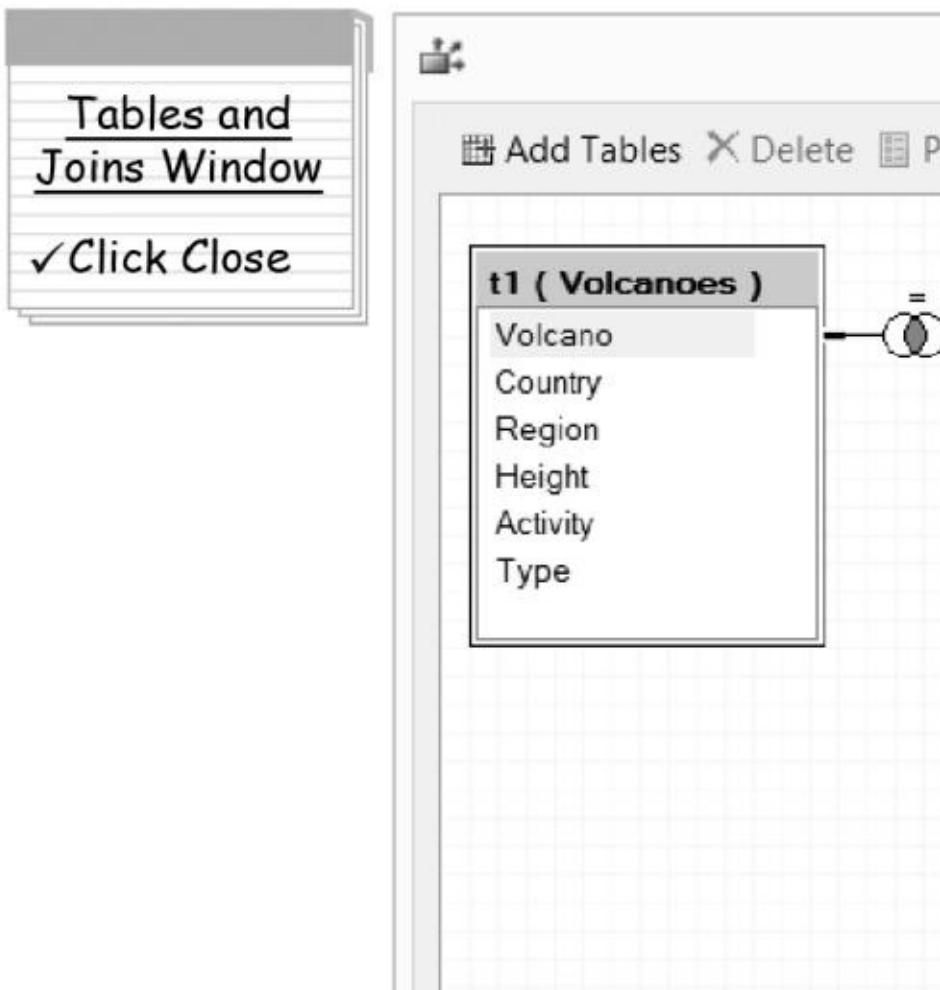
It's not obvious from the common columns for the Tables and Joins window

### What If th

No problem! Guide will let them and the Tables and Joins table, then right click the pop-up menu. Next, choose click **OK**. SAS

columns, and

In the Tables and Joins window, you can add tables. Notice the line drawn from the Volcano column in the To table to a diagram on the line, and then join. In this case, only rows from both tables will be included.



Join Order

INNER JOIN: t1.Volcano = t2.Volca

Click **Close** to close the T

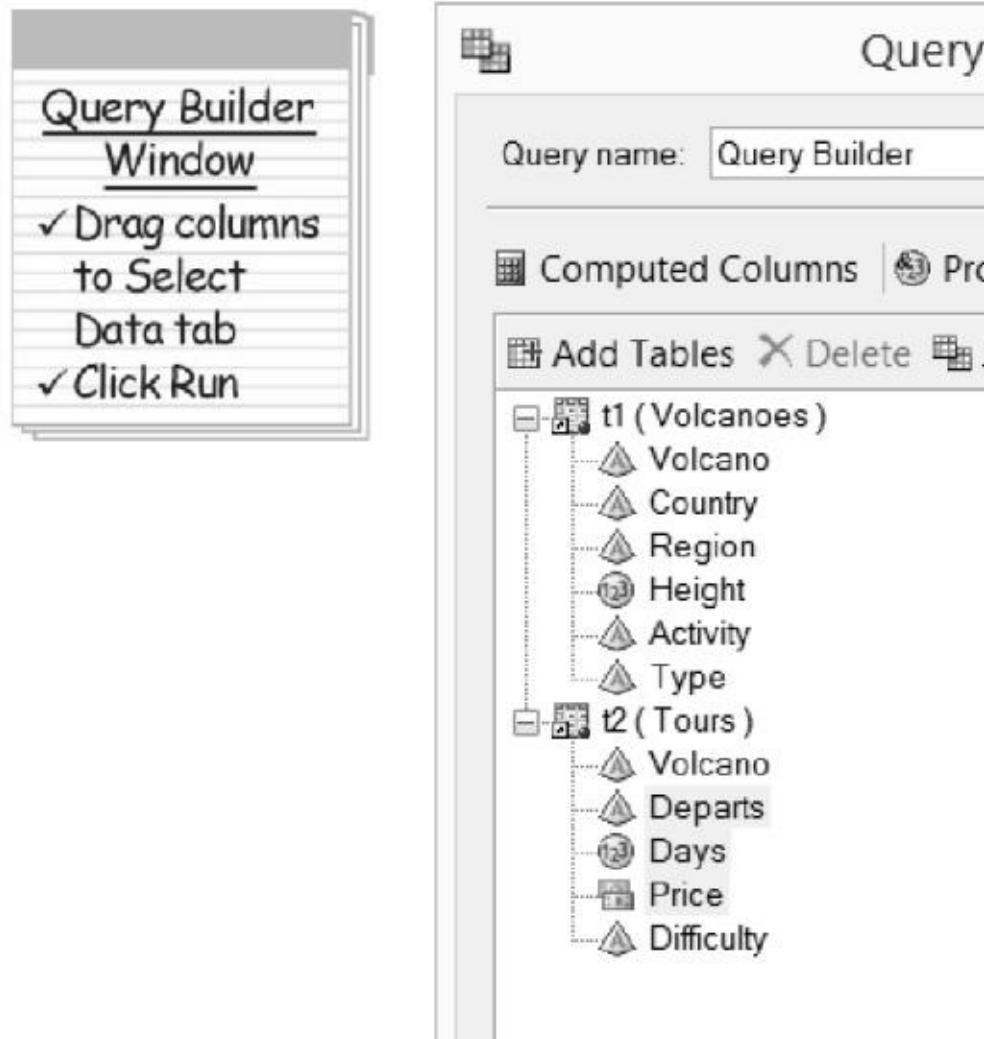
## Table

It is possible to link tables in common ways such as month comparing the tables in the Enterprise Architect environment automatically. Enterprise Architect provides a To link the tables, click the by clicking the Create an association, clicking the up menu.



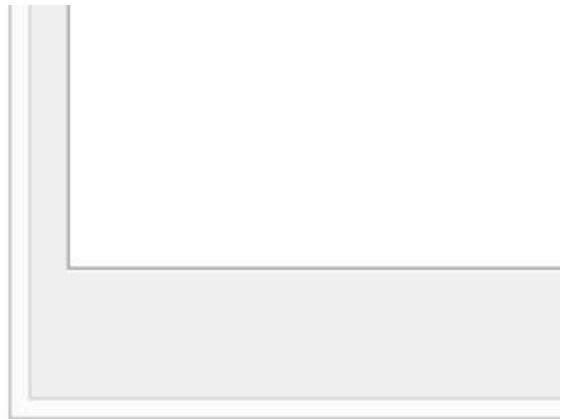
## 120 The Little SAS Enterprise Guide Book

Before you can run the query, you must select columns, click the Data tab. For this query, select Volcano from the Volcanoes table and Tours from the Tours table.



### Query Builder Window

- ✓ Drag columns to Select Data tab
- ✓ Click Run



Click **Run** in the Query E

W

In th  
each  
betw  
two t  
column  
for th



The data table created by volcanoes from the Volca from the Tours data table the result. This is the defa volcanoes in the Tours da represented here. Howev not included in the result

Query Builder ▾

Input Data (2) Code

Modify Task | Filt

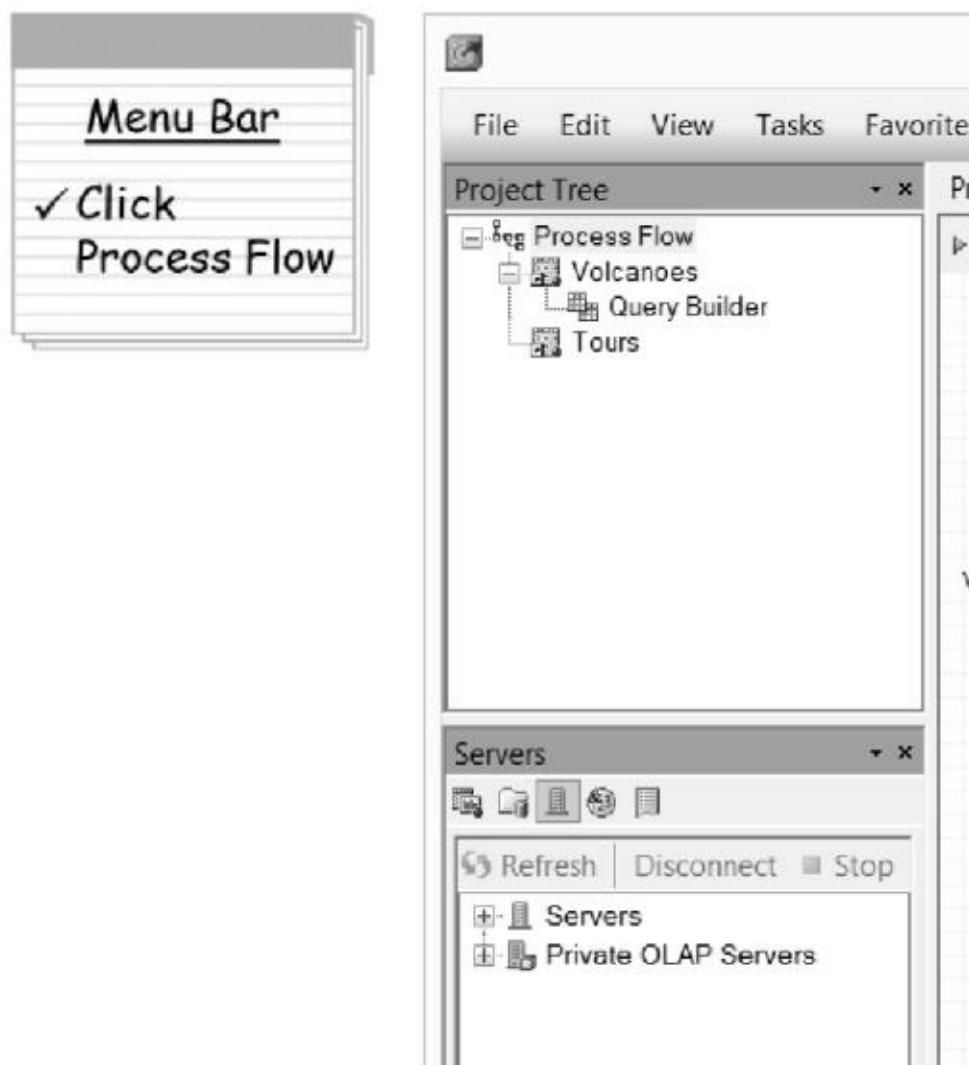
|    | Volcano     | Count      |
|----|-------------|------------|
| 1  | Etna        | Italy      |
| 2  | Fuji        | Japan      |
| 3  | Kenya       | Kenya      |
| 4  | Kilauea     | USA        |
| 5  | Kilimanjaro | Tanzania   |
| 6  | Krakatau    | Indonesia  |
| 7  | Poas        | Costa Rica |
| 8  | Reventador  | Ecuador    |
| 9  | St. Helens  | USA        |
| 10 | Vesuvius    | Italy      |

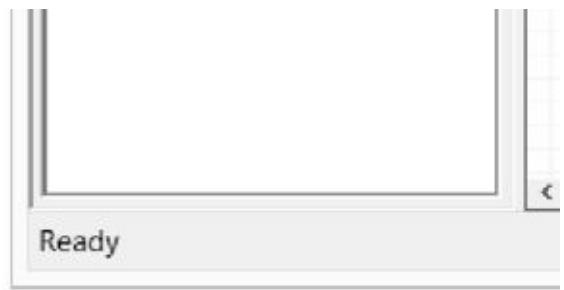




## 122 The Little SAS Enterprise Guide Book

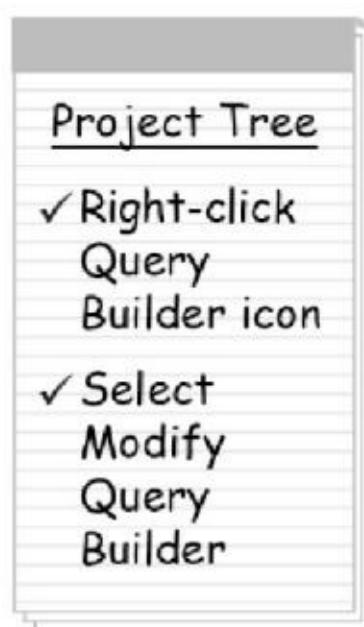
Click the **Process Flow** button in the toolbar. It is not obvious from the Project Tree tables, but in the Process Flow default, results of queries are stored in a default loc



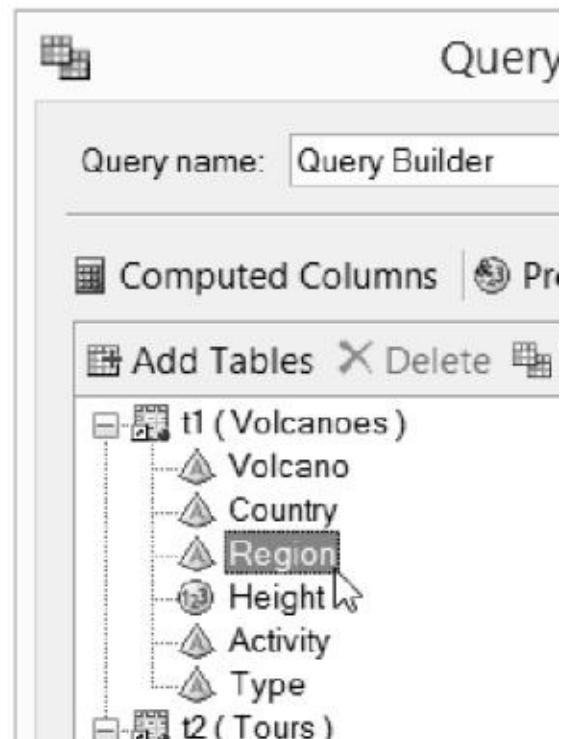




**Filtering the data** Now that the tables have been joined together, it is time to filter the data to focus on Europe. To do this, you can use the **Filter** feature in the data tables.



Right-click the Query Builder icon in the Project Tree to open the **Query Builder** to reopen the Query Builder. Click **File** > **New Query** to open the Query Builder. Then click the **Add Tables** button to add the Volcanoes data table. You can then filter the data by selecting America, Europe, Asia, Australia, or Oceania from the Region dropdown menu.



✓ Drag Region

-  Volcano
-  Departs
-  Days
-  Price
-  Difficulty

To create a filter based or  
it to the **Filter Data** tab.



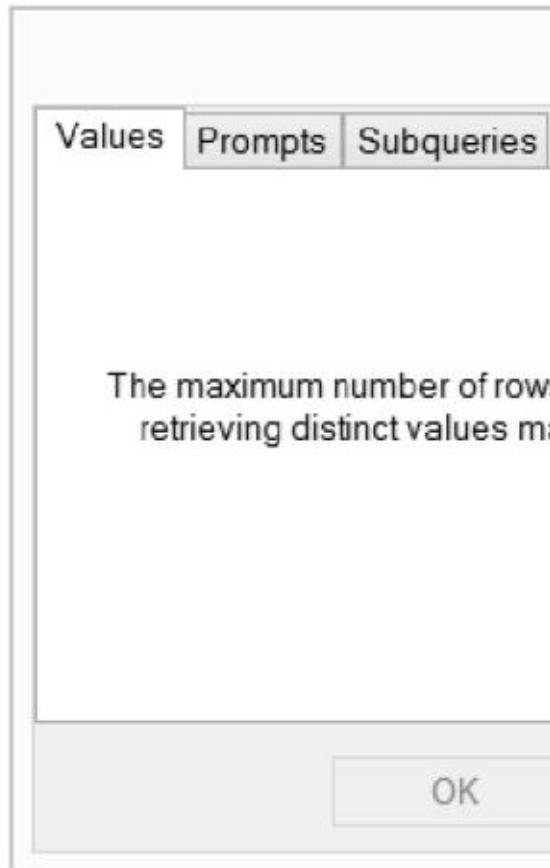
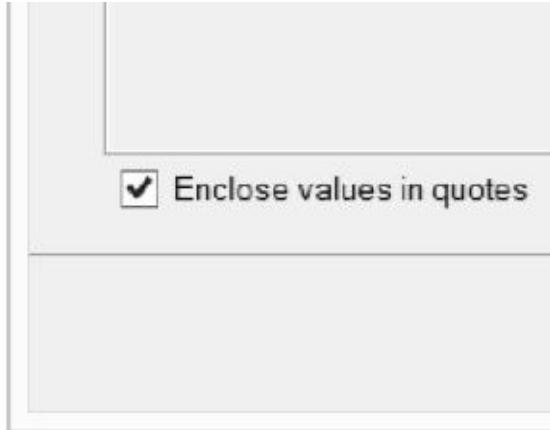
This automatically opens table (table 1) listed as the example, we want all values in the Region column. In the **Operator** and select **In a list**.

The screenshot shows the "New Filter Wizard" interface. On the left, a sidebar lists two steps:

- ✓ Select In a list from Operator drop-down menu
- ✓ Click down-arrow next to Add button

The main panel is titled "1 of 2 Build a basic filter". It contains the following configuration fields:

|                                                       |                   |
|-------------------------------------------------------|-------------------|
| Source Column:                                        | t1.Region         |
| Column Name:                                          | Region            |
| Operator:                                             | In a list         |
| <input type="checkbox"/> Generate filter for a prompt |                   |
| Values:                                               | (empty text area) |
| t1.Region IN<br>(<br>)<br>(empty text area)           |                   |



The values for Region are and the codes for Asia are As and Eu. Select both **As**, then holding the control key and clicking **Eu**. Click **OK**.



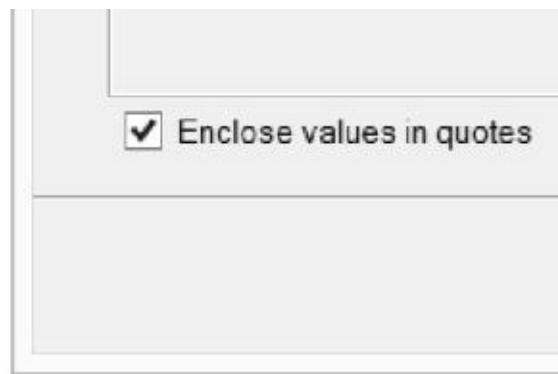
The selected values, As a wizard. Because these are box located at the bottom

The screenshot shows the 'New Filter Wizard' interface. On the left, a sidebar displays the title 'New Filter Wizard' and a button 'Click Next'. The main panel is titled '1 of 2 Build a basic fi' and contains the following configuration:

|                |           |
|----------------|-----------|
| Source Column: | t1.Region |
| Column Name:   | Region    |
| Operator:      | In a list |

A checkbox labeled 'Generate filter for a prompt' is present. Below this, under 'Values:', there is a list box containing 'As' and 'Eu'. At the bottom, the generated filter expression is shown:

```
t1.Region IN  
(  
'As',  
'Eu'  
)
```



Click **Next**.

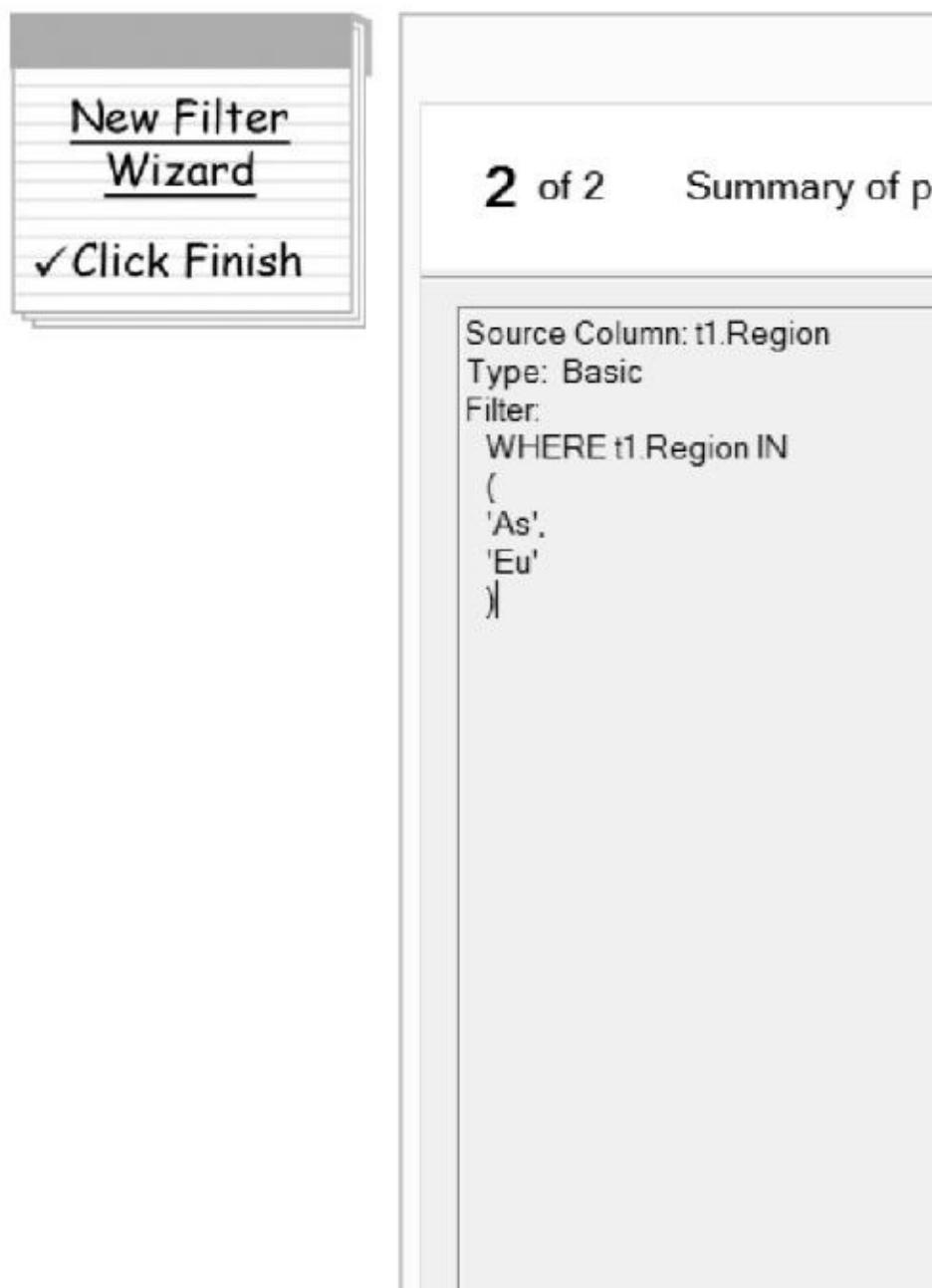
V

Using filters a regular expression Enter the only efficient unique large simple box



**126**   *The Little SAS Enterprise Guide Book*

The final window of the New Filter Wizard is shown below.





Click **Finish** to complete



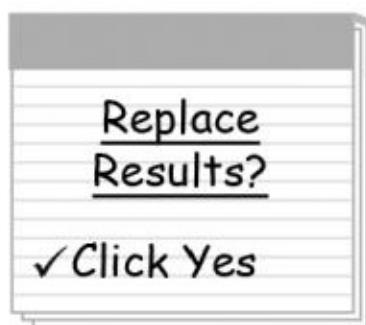
Now the filter appears on

The screenshot shows the Microsoft Query Builder interface. At the top, there's a title bar with a grid icon and the word "Query". Below it is a toolbar with icons for "Add Tables" (grid), "Delete" (cross), and "Properties" (gear). The main area is titled "Query name: Query Builder". Underneath, there are tabs for "Computed Columns" and "Properties". A large tree view lists two tables: "t1 (Volcanoes)" and "t2 (Tours)". The "t1 (Volcanoes)" table has columns: Volcano, Country, Region, Height, Activity, and Type. The "t2 (Tours)" table has columns: Volcano, Departs, Days, Price, and Difficulty.

| Table          | Column     | Type |
|----------------|------------|------|
| t1 (Volcanoes) | Volcano    | Icon |
| t1 (Volcanoes) | Country    | Icon |
| t1 (Volcanoes) | Region     | Icon |
| t1 (Volcanoes) | Height     | Icon |
| t1 (Volcanoes) | Activity   | Icon |
| t1 (Volcanoes) | Type       | Icon |
| t2 (Tours)     | Volcano    | Icon |
| t2 (Tours)     | Departs    | Icon |
| t2 (Tours)     | Days       | Icon |
| t2 (Tours)     | Price      | Icon |
| t2 (Tours)     | Difficulty | Icon |



Click **Run** to see the results.



When SAS Enterprise Guide runs a job from a previous run, click **Yes**.

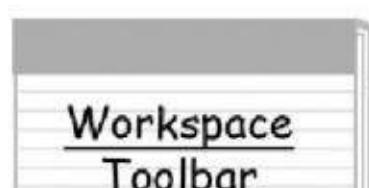


Look at the resulting data. Notice that the volcanoes in Europe appear in the data.

The screenshot shows the SAS Enterprise Guide Query Builder interface. At the top, there's a toolbar with tabs for "Input Data (2)", "Code", "Modify Task", and "Filter". Below the toolbar is a table with two columns: "Volcano" and "Country". The table contains four rows of data:

|   | Volcano  | Country   |
|---|----------|-----------|
| 1 | Etna     | Italy     |
| 2 | Fuji     | Japan     |
| 3 | Krakatau | Indonesia |
| 4 | Vesuvius | Italy     |

**Selecting which rows to include in the result** You can expand the number of rows to include in the list all the rows that have tours. In SAS Enterprise Guide, you can select which rows appear in both tables by using a query join.



To reopen the query, right-click the workspace and select **Modify Query** for the query result.

✓ Click Modify Task

Query Builder Window

✓ Click Join Tables

Query

Query name: Query Builder

Computed Columns  Pre

Add Tables  Delete

t1 (Volcanoes)

- Volcano
- Country
- Region
- Height
- Activity
- Type

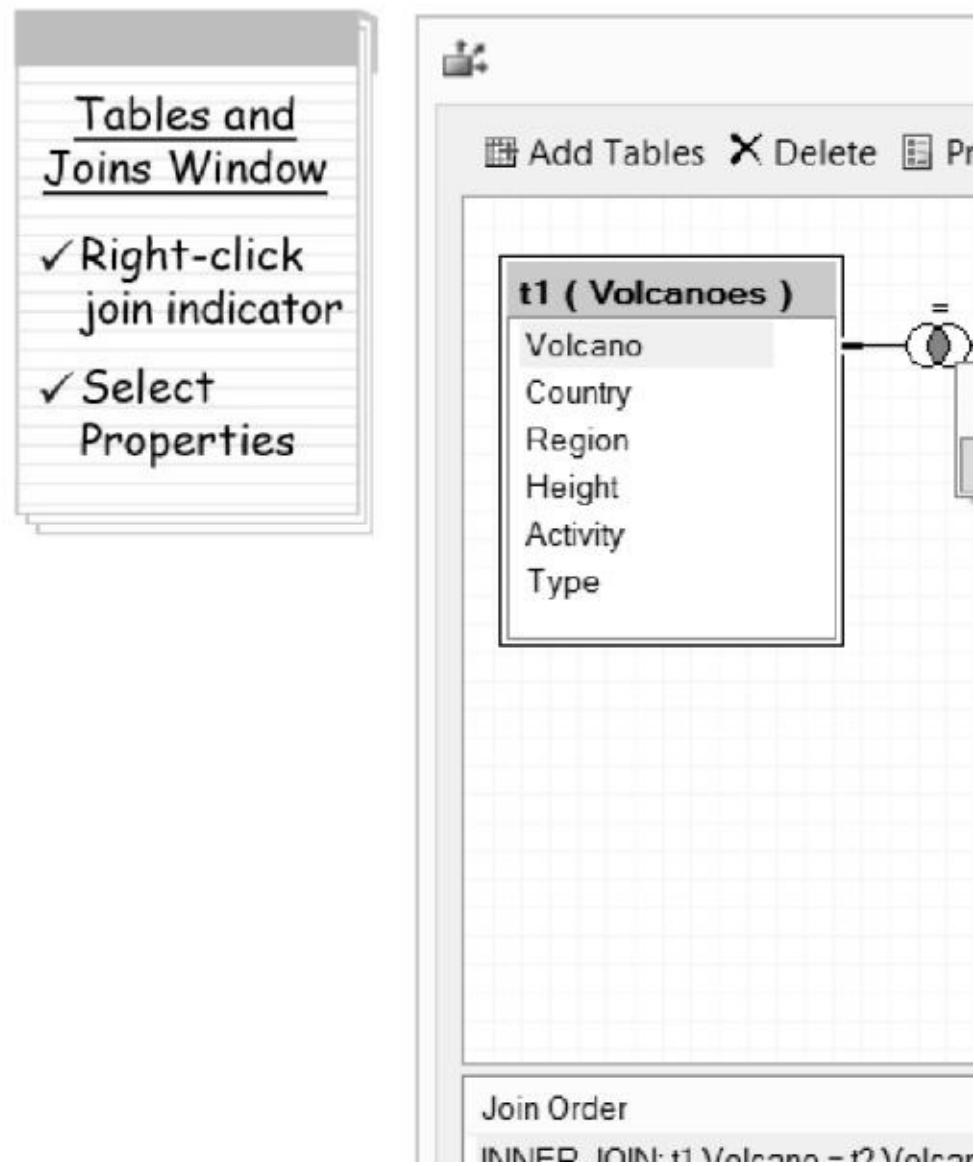
t2 (Tours)

- Volcano
- Departs
- Days
- Price
- Difficulty

Click **Join Tables** to oper



In the Tables and Joins window, right-click on the line connecting the tables and choose the join type from the pop-up list.



BREVETTO SOVRASTITUITO - 12. VERSO





This opens the Join Properties dialog box. The first tab, **Join type**, is selected. This tab contains five options: **Matching rows only given a condition**, **All rows from the left table given a condition**, **All rows from the right table given a condition**, **All rows from both tables given a condition**, and **The cartesian product (Cross join)**. The last option is highlighted.

**Join type**

- Matching rows only given a condition**
- All rows from the left table given a condition
- All rows from the right table given a condition
- All rows from both tables given a condition
- The cartesian product (Cross join)**

**Condition**

Left table and column:

t1.Volcano

Filter to include in the 'join' condition:





For this join, you want all rows from both tables

The screenshot shows the 'Join Properties' window divided into two main sections: 'Join type' and 'Condition'.

**Join type:**

- ✓ Select All rows from both tables
- ✓ Click OK

**Condition:**

Left table and column:  
t1.Volcano

Filter to include in the 'join' table:



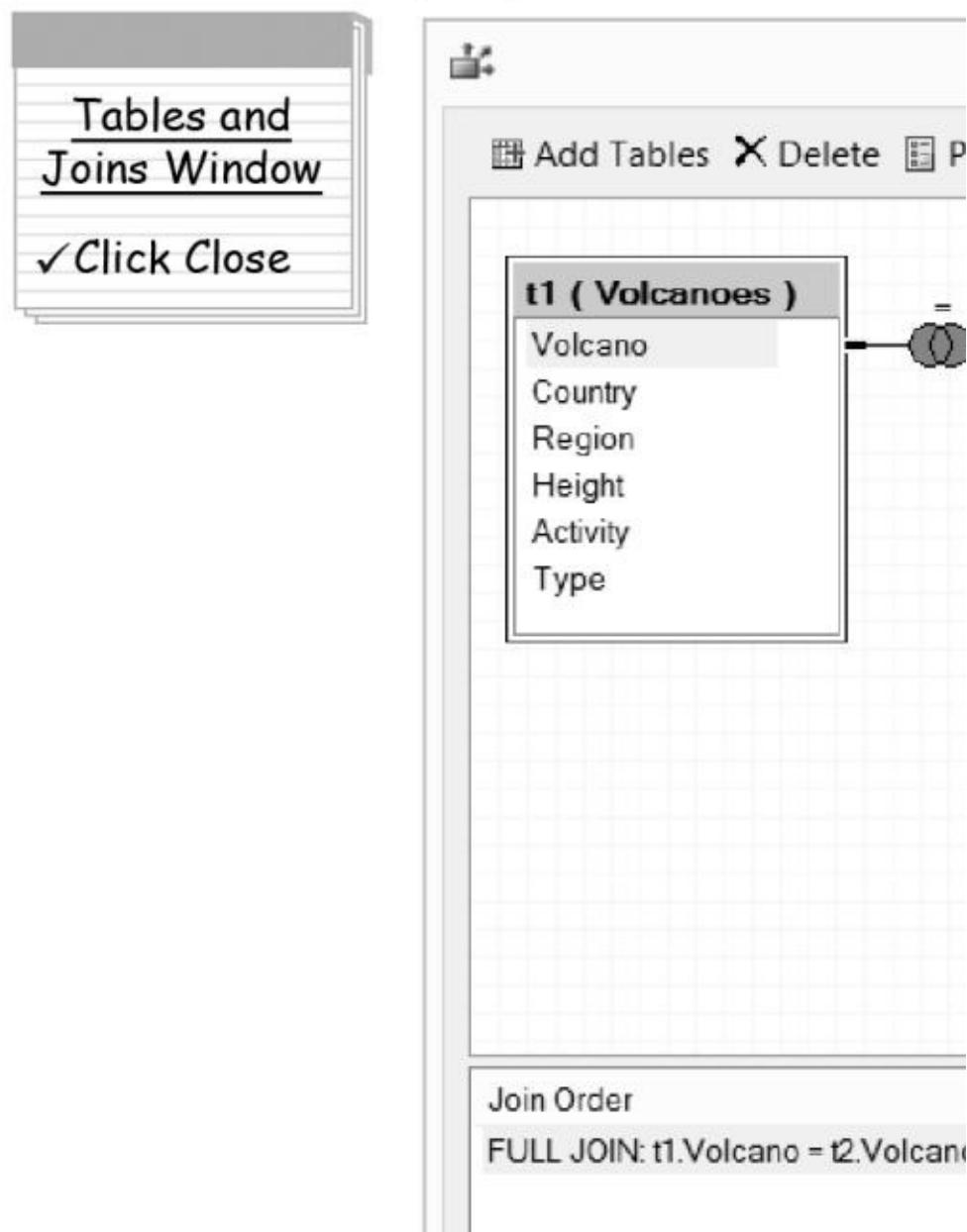
Notice that the join symbol is black. Click **OK**.

If you want a join between rows from the Right or Left tables, change the order in which they appear in the window. This will affect the order of the tables in the Join window. This is useful when you want to open the data from both tables in the same window.



## 132 The Little SAS Enterprise Guide Be

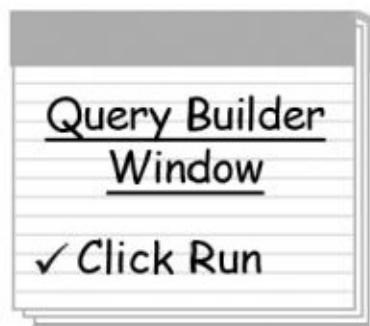
The join indicator in the **Join Order** pane indicates which table you just selected.



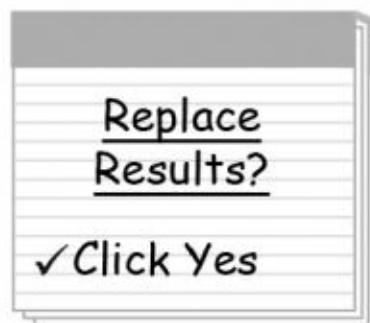


Click **Close** to return to the

In the Query Builder window,



Click **Yes** when SAS Enter results.





Look at the resulting data in Asia and Europe, even Tours data table (Departs which there are no tours. the Volcanoes data table,

Query Builder ▾

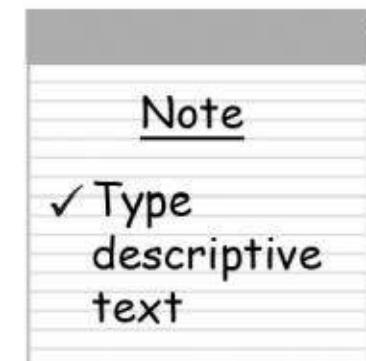
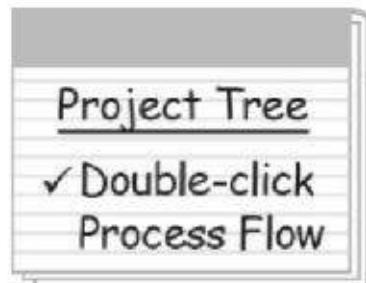
Input Data (2) Code

Modify Task | Filter

|    | Volcano       | Count       |
|----|---------------|-------------|
| 1  | Arthur's Seat | UK          |
| 2  | Barren Island | India       |
| 3  | Elbrus        | Russia      |
| 4  | Etna          | Italy       |
| 5  | Fuji          | Japan       |
| 6  | Grimsvotn     | Iceland     |
| 7  | Kliuchevskoi  | Russia      |
| 8  | Krakatau      | Indonesia   |
| 9  | Pinatubo      | Philippines |
| 10 | Puy de Dome   | France      |
| 11 | Santorini     | Greece      |
| 12 | Vesuvius      | Italy       |

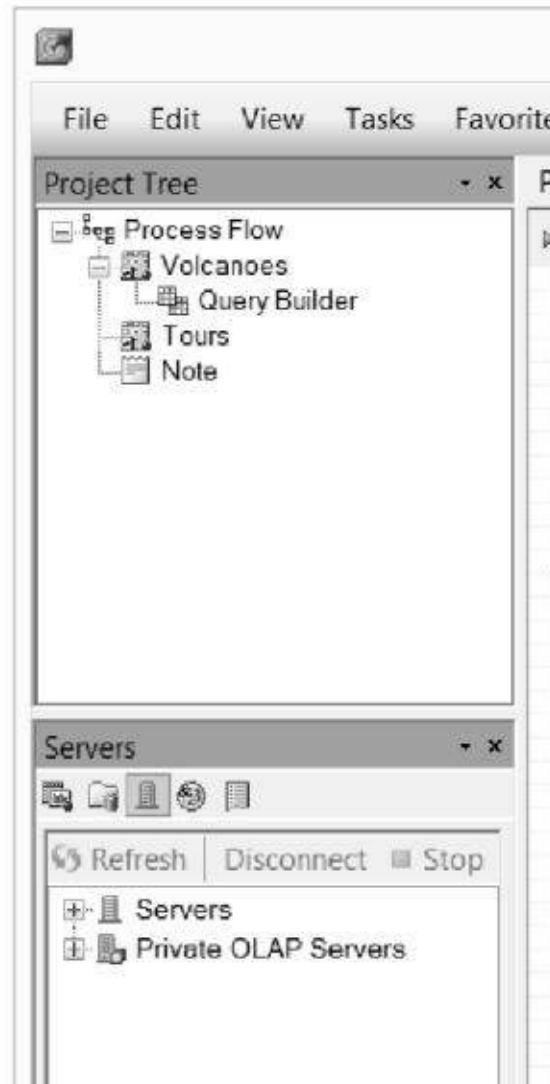


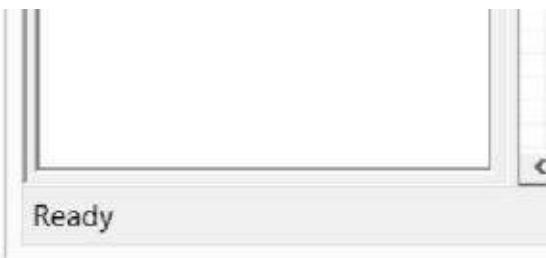




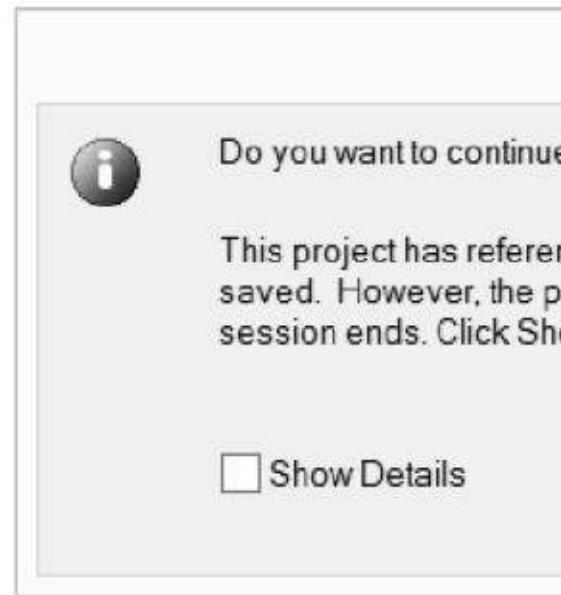
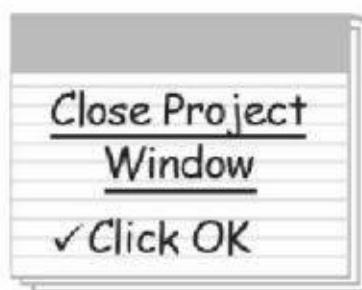
## Completing the tutc

Double-click the words P from the menu bar. Enter workspace.





Now save the project and the menu bar. Navigate to the name **TutorialID**, and SAS Enterprise Guide. Be WORK library by default Enterprise Guide. In this permanent location since project.



Click **OK**.





# REFERENCE

# S

- |                  |                             |
|------------------|-----------------------------|
| <b>Chapter 1</b> | SAS Enterprise Guide        |
| <b>Chapter 2</b> | Bringing Data Into SAS      |
| <b>Chapter 3</b> | Working with Variables      |
| <b>Chapter 4</b> | Producing Output            |
| <b>Chapter 5</b> | Modifying Data              |
| <b>Chapter 6</b> | Sorting and Subsetting Data |
| <b>Chapter 7</b> | Combining Data              |
| <b>Chapter 8</b> | Working with Text           |







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an innova  
innovation  
traditions

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[www.joecraven.com](http://www.joecraven.com). Reprinted





# CHAPTER 1

## SAS Enterprise Projects

- 1.1 SAS Enterprise Guide Projects **140**
- 1.2 Maximizing and Saving Project Time **140**
- 1.3 Managing Process Flow **140**
- 1.4 Running Projects and Subprocesses **140**
- 1.5 Linking Items in Projects **140**

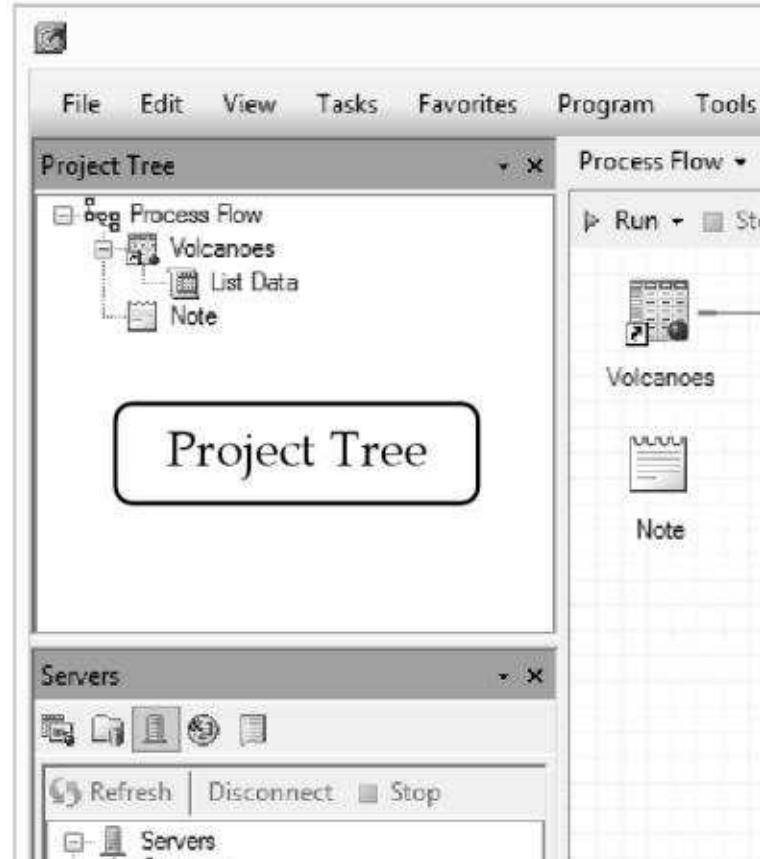
- 1.7     SAS Data Tables
- 1.8     Viewing Properties
- 1.9     Changing Properties
- 1.10    Selected Standard
- 1.11    Documenting Project

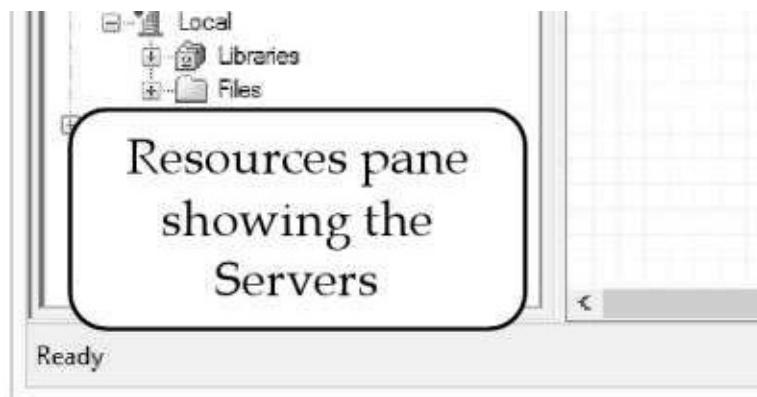


## 1.1 ► SAS Enterprise Guide

SAS Enterprise Guide has many ways to close SAS Enterprise Guide – closing some windows, or closing the whole window in the way you want. Then SAS Enterprise Guide will close. If you close it, everything will be just where you left it.

Here is SAS Enterprise Guide with three windows open:





Some windows are open by default. You can open or unhide the major windows.

**Docked windows** Some of the docked windows can appear on the right side. To change a window from one side to another, click the window and select **Dock Left**. You can also select **Auto Hide**. If you hide a window, position your mouse over it and click to view a hidden window, position your mouse over the window, and click to reduce it from the window. These windows



**Project Tree** The Project Tree window displays a hierarchical tree diagram of your project.



**Servers** The Servers window displays the data libraries on those servers installed. The computer can be a SAS server. This window





**Tasks** The Tasks window displays a list of tasks running in the current project. You can click its name in this view to open the Task Status window. This window is closed by default. To open this window, click



**SAS Folders** The SAS Folders window displays a list of SAS folders on the SAS server. This window is closed by default. To open this window, click



**Data Exploration History** The Data Exploration History window displays a list of SAS data tables you have recently opened. It includes a Resources pane, and is closed by default. To open this window, click



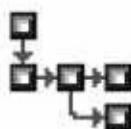
**Prompt Manager** The Prompt Manager window displays a list of prompts for the current project. This window is closed by default. To open this window, click



**Task Status** The Task Status window displays a list of tasks running. This window is closed by default. To open the Task Status window, click

**Workspace** The workspace is the bottom, and you can't close it. To open the workspace, click

Process Flow window and other it  
The workspace is always there and  
individual items inside the worksj

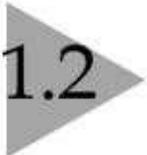


**Process Flow** The Pro  
relationship using a sche  
want inside a single proj  
select it from the **View** m  
drop-down list at the top  
on the menu bar, or press

**Menus and tools** The menus  
the menu bar) are always the same  
called the workspace toolbar) char  
different from the options above a  
pop-up menu for that object. So yo  
thing. This book cannot list all the  
find them.

**Restoring windows** Once yo  
them back where they started. To  
from the menu bar. Then in the Ge  
**Layout**.





## 1.2 Projects

In SAS Enterprise Guide, all the work you do is contained in a project. A project is a collection of related data, tasks, results, programs, and other items. You can have many projects in one session, even if your data are stored in different locations. That way, when you come back to a session later, you won't be wondering which data tables you worked with.

You can have as many projects as you like. You can have multiple different projects, so there is a lot of flexibility. You can also open only one project at a time. However, if you are working in a session, each displaying a different project, that person must have access to both projects.

To create a new project, select **File** > **New** > **Project**. To open an existing project, select **File** > **Open** > **Project**.

### Project Tree and Process Flow

The Project Tree and Process Flow windows are hierarchical tree diagrams, while the Results window is a grid-based diagram. In either window, the items are organized into a tree structure. The tree structure shows the relationship between items in a project. For example, a project might contain a data table, a program, and a note.

## Project Tree



**Data** Data files in a project, databases or applications, no exist. This icon represents:



**Tasks** Tasks are specific to a Chart. Every time you run a task. This icon represents:





**Results** Results are the represented by icons labeled text, PowerPoint, or Excel Report format.

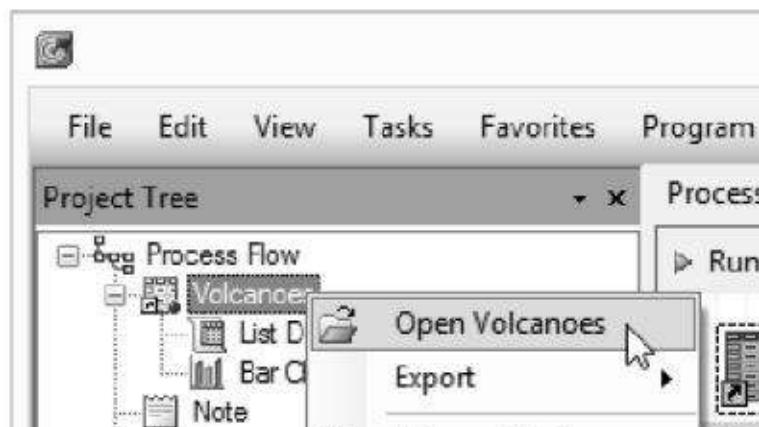


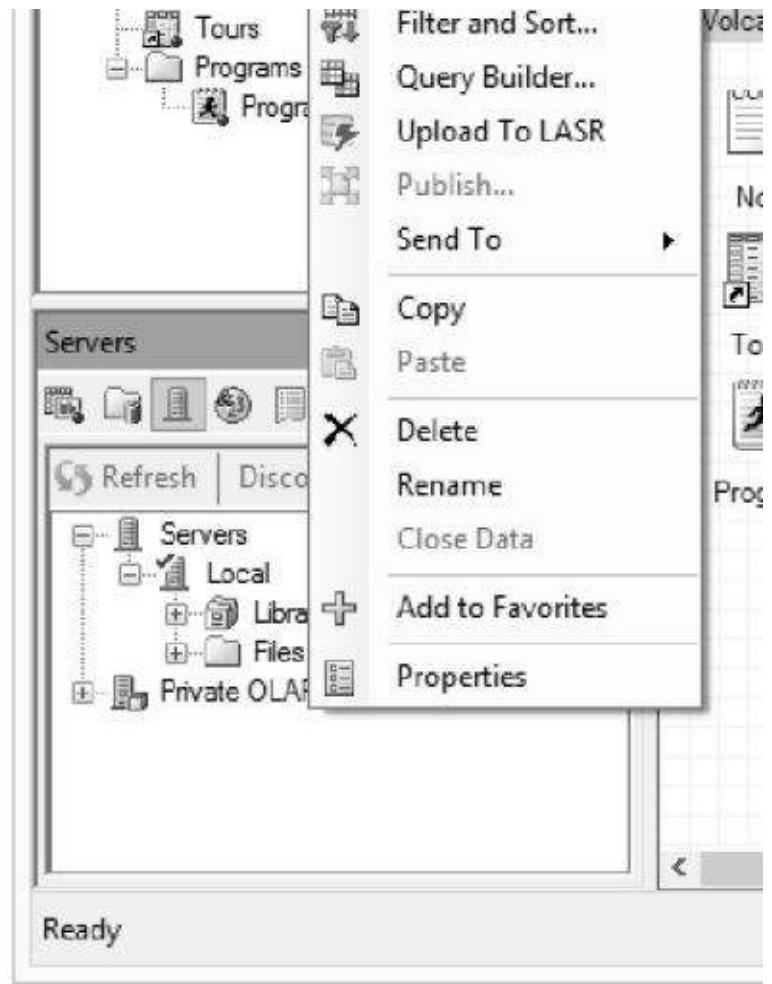
**Notes** Notes are optional comments or instructions.



**Programs** Programs are found in SAS Enterprise Guide,

**Showing properties and options** You can show properties and options for an item by right-clicking its icon in the Project Tree and selecting the item from the pop-up menu. You can open any item by selecting **Open** from the pop-up menu.





**Renaming and deleting items**  
selecting **Rename** from the pop-up menu and selecting **Delete**. Note that if you delete a data item, it will also delete the actual data file.

**Saving a project** To save a project, click **File > Save As** from the menu bar. Each project has its own folder. You can save data, programs, and reports. To save a report, click **File > Export** from the menu bar and selecting **Export** from the pop-up menu.



### 1.3

## Maximizing and Splitting the workspace

The workspace is a busy place. In addition to the results, program, log, and notes. Both windows can be maximized so that you can see two if you split the workspace.

### Maximizing the workspace

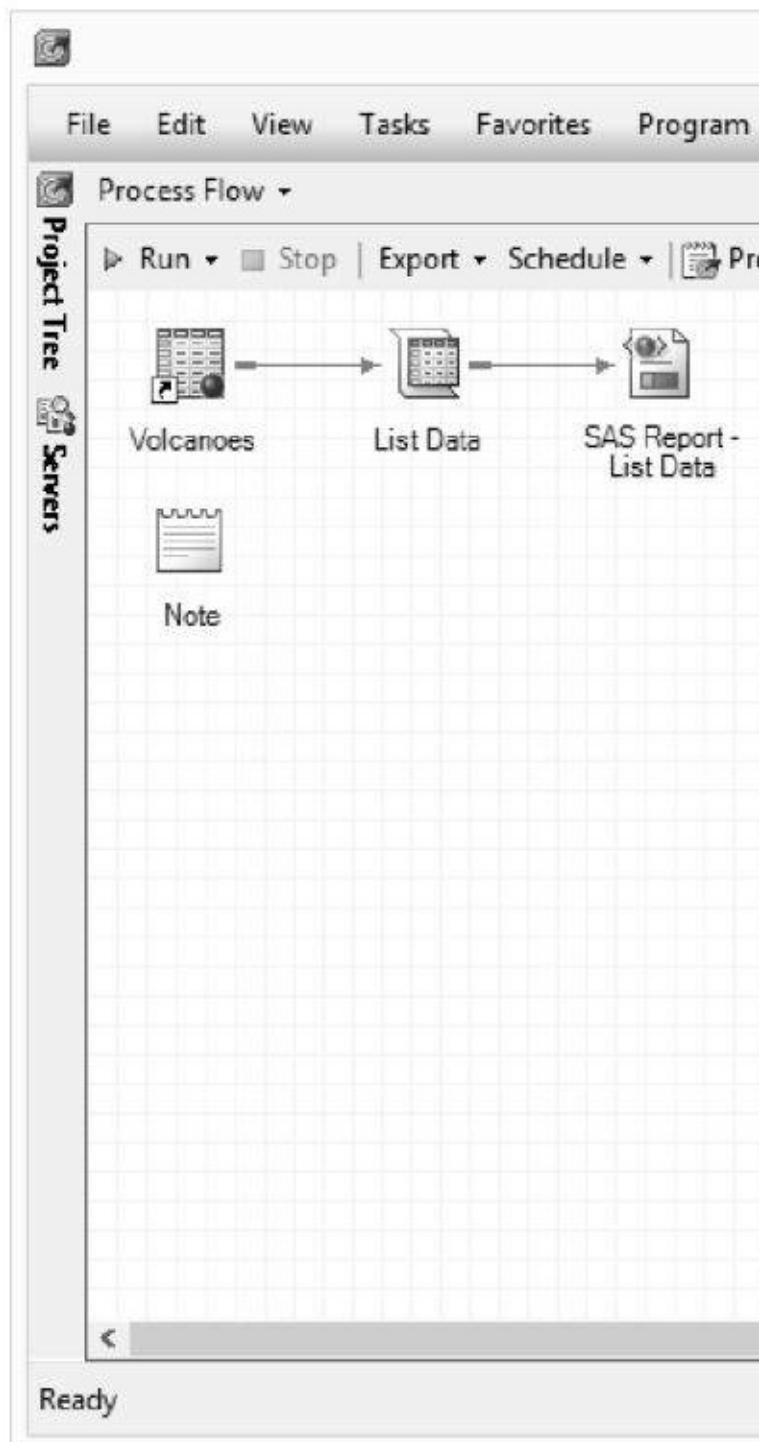
If your screen is small, you may want to maximize the workspace as large as possible before you split it. To do this, select

► **Maximize Workspace** from the View menu or the toolbar. When you maximize the workspace, the Project Tree and Resources pane will become tabs pinned to the edge. You can temporarily expand those windows by moving the cursor over a tab. When you move the cursor away, the window will be reduced to a tab again. To return the workspace to its normal size, select **View ► Maximize Workspace**.

### Splitting the workspace

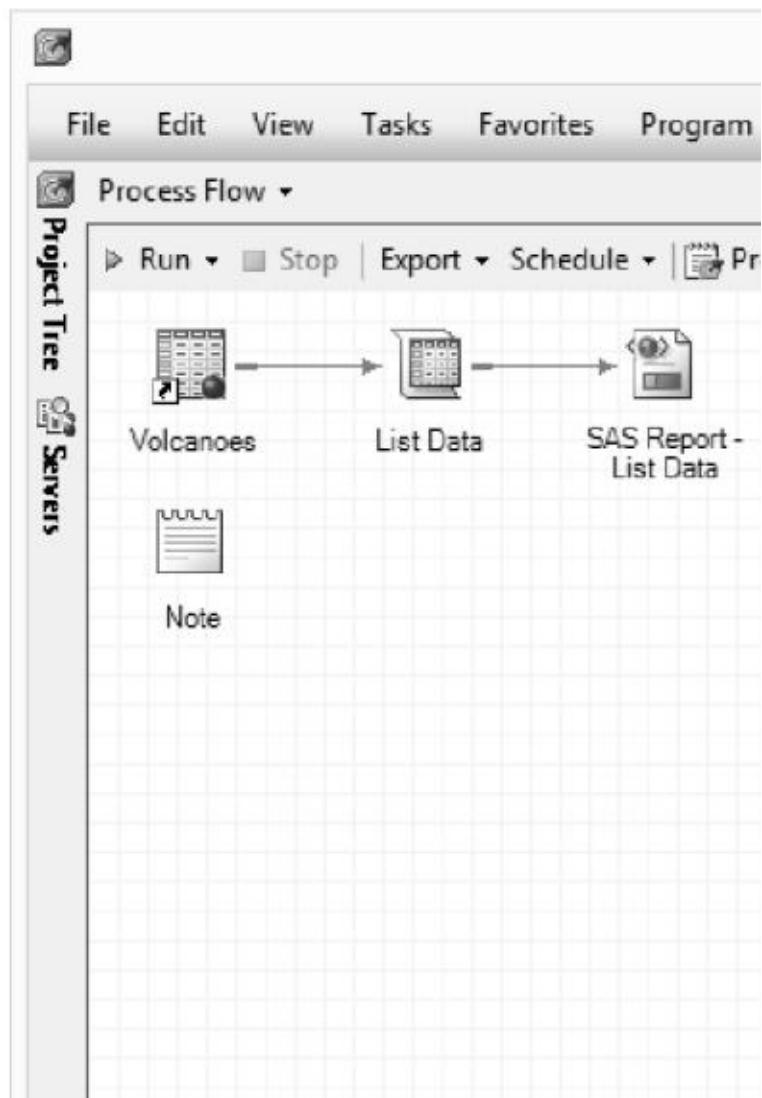
You can split the workspace by clicking the Workspace Layout icon  on the toolbar.

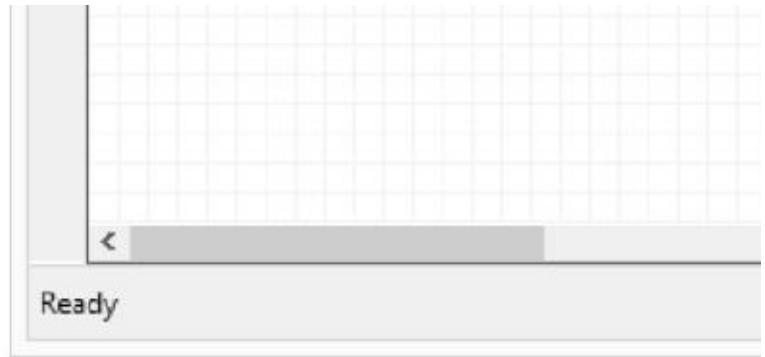
the pull-down list. You can also do this from the toolbar.





You can click the down-arrow at the top of the Project Tree to view more items in your project. To do this, click the arrow icon. The workspace has been split side by side. The left pane shows the Project Tree and the right shows a Data Grid.





To unsplit the workspace, click the pull-down list. You can also click on the workspace.



## 1.4 Managing Process Flow

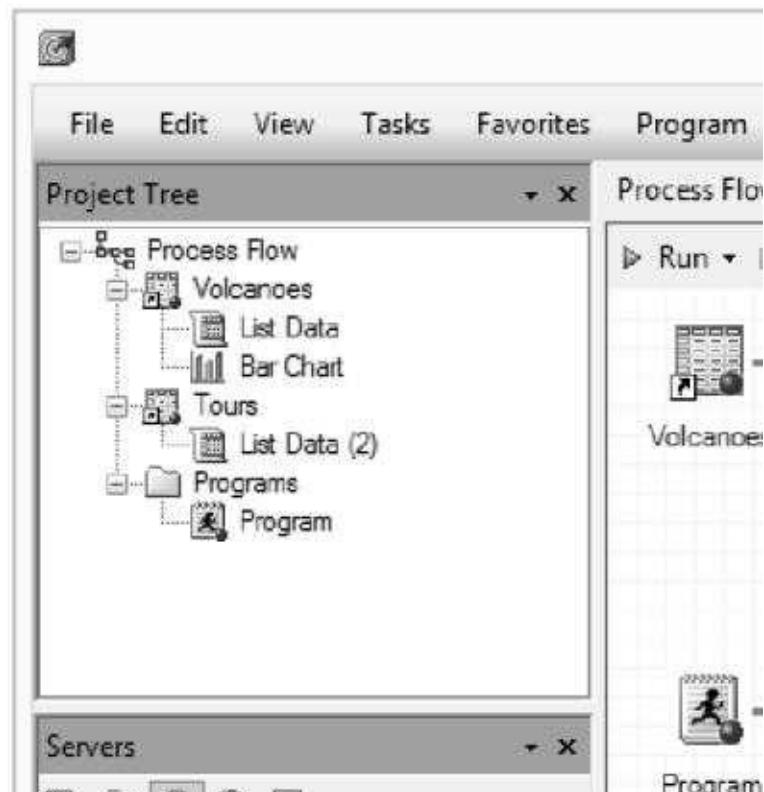
SAS Enterprise Guide projects can be complex. If you have a complex project, you may want to manage it.

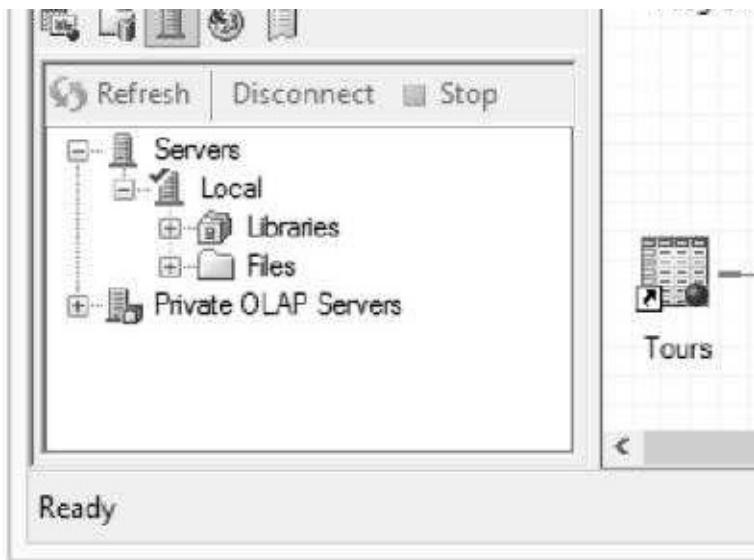
### Adding new process flows

Choose **Process Flow** from the menu bar, or

choose **Process Flow** from the pop-up menu.

The Project Tree will show all of them in a single tree.





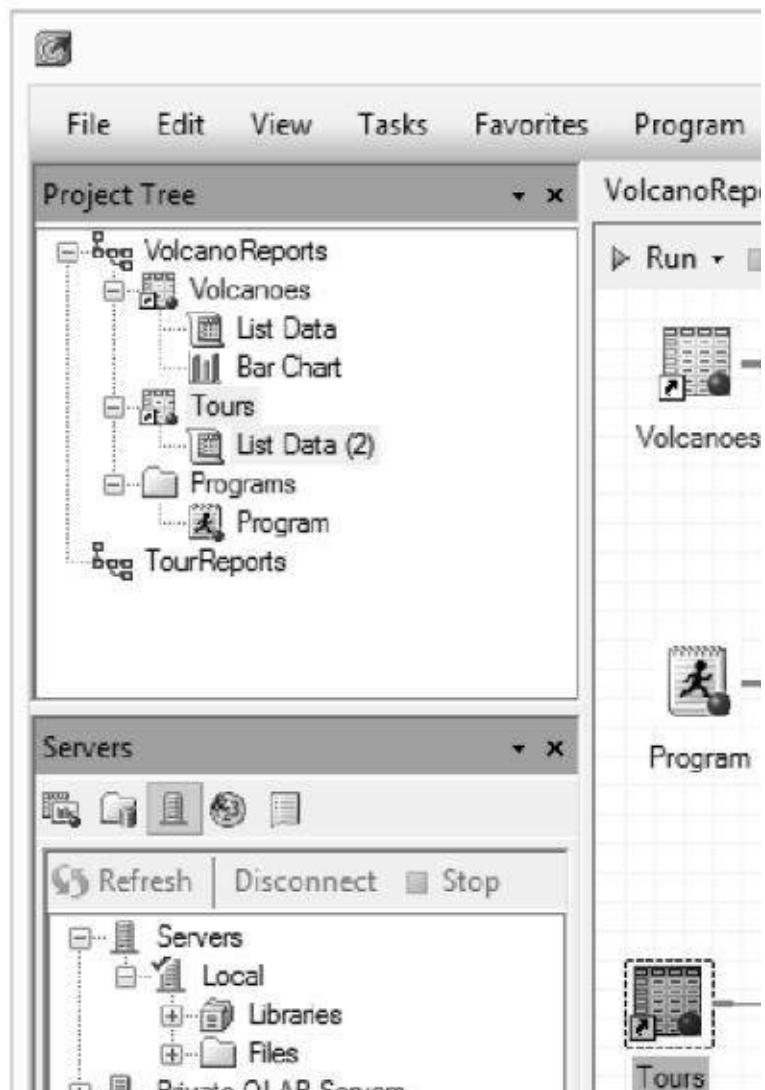
To view a process flow, double-click the **Process Flow** drop-down list or to open a pull-down list of recentl

**Customizing process flows** displays options for customizing the Layout, Auto Arrange, Zoom, and Color.

**Renaming and deleting process flows** When you add a new process flow, it is named **Process Flow (n)**. To give a process flow a descriptive name, right-click its name in the Project Tree and select **Rename** from the pop-up menu. To delete a process flow, right-click its name in the Project Tree and select **Delete** from the pop-up menu.



**Moving and copying items**  
the control key (CTRL), and click a  
**Move to ► process-flow-name** from  
moved to a process flow named To





Copying items is similar to moving items to be copied using control-click menu, and right-click the target

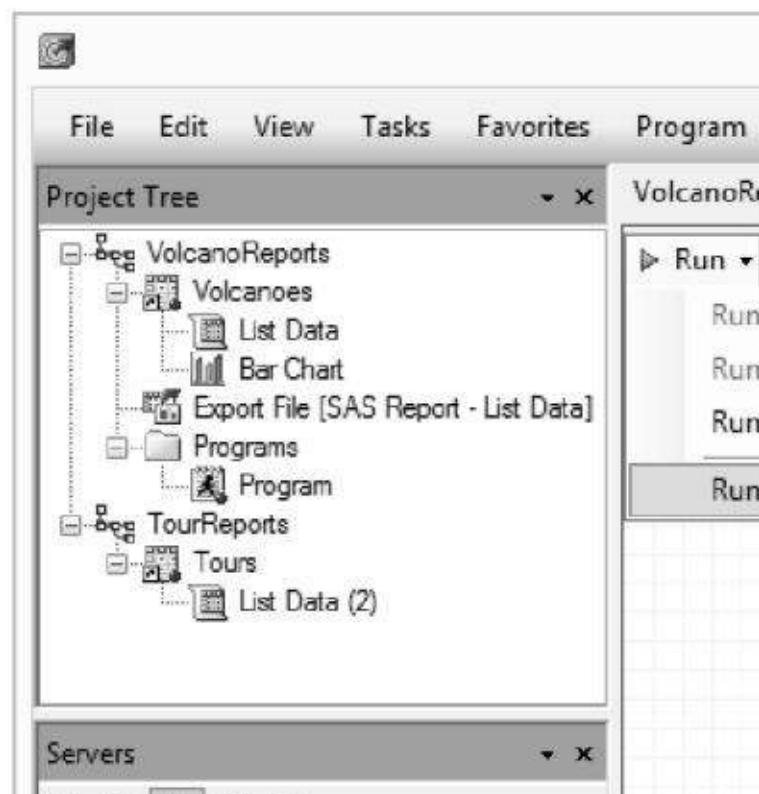
**Printing process flows** You print a copy of your process flow. control the page size and orientation click the process flow and select **File ► Page setup for Process Flow** from menu bar. To preview a printout, click **File ► Print preview for Process Flow**. To print the process flow, select **File ► Print Process Flow**. Here is the Print preview window for the new process flow named TourReports.

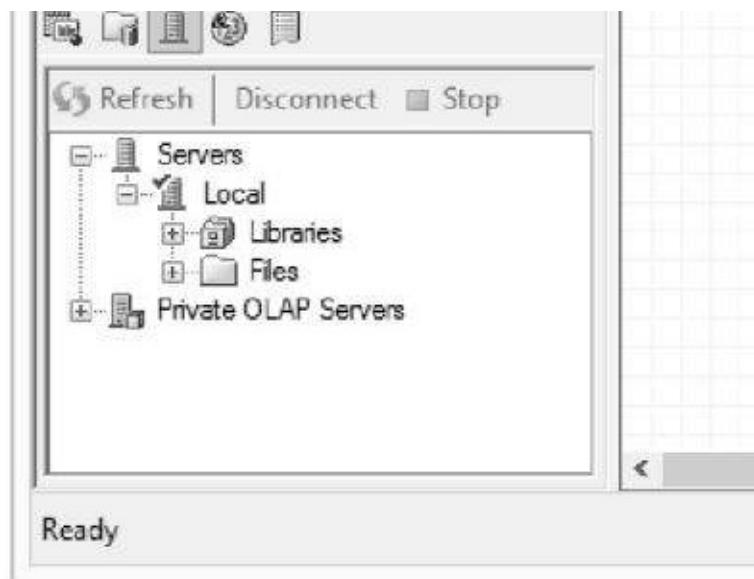


## 1.5 Running Projects and

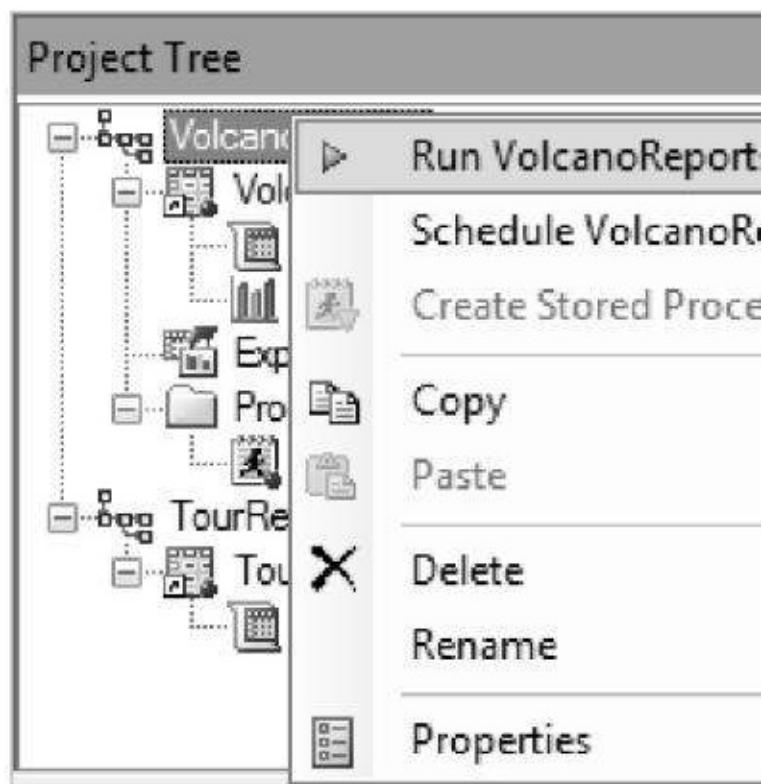
Projects have a lot of different parts: one part of your project, or one process flow, or a bunch of parts of your project, but the way you run them is the same.

**Running a project** To run a project, click the Run button on the toolbar, or click **Run** on the workspace menu or the pull-down menu.





If you have more than one process they appear in the Project Tree. To Project Tree and drag it to the plac





## **Running part of a process**

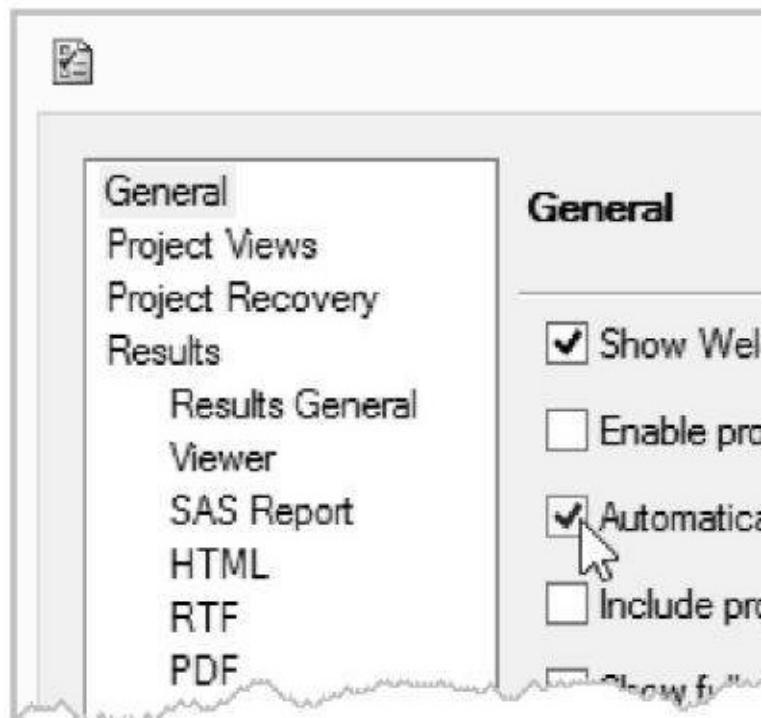
**flow** To run one branch of a process flow or an individual item, right-click the icon for that item or branch, and select **Run** or **Run Branch from *item-name*** from the pop-up menu. You can also click that icon (to make it active) and then click **Run** on the workspace toolbar and select **Run *item-name*** or **Run Branch from *item-name*** from the pull-down menu. The task is being run from the process

## **Creating an Autoexec process**

run first. For example, you might add them before anything else in your process flow will make them run first if you add some other part of your process flow called an Autoexec process flow. If the name Autoexec, it knows to run it process flow, simply add a new pi

the name Autoexec. Then, by default you want to run the Autoexec pro-

You can tell SAS Enterprise Guide prompting you. To do that, select the window. In the General page, check **opens**, and click **OK**.

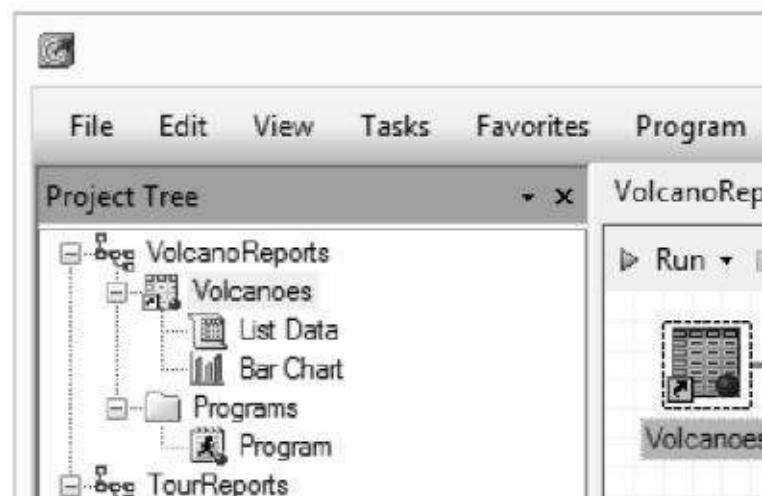


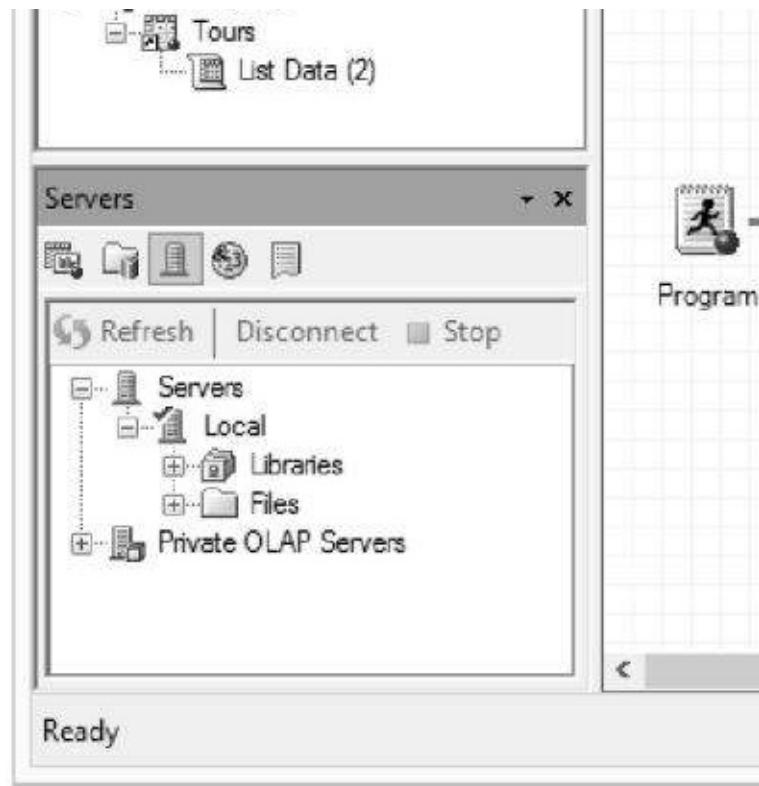


## 1.6 Linking Items in Process Flow

When you run a process flow, item branches created by links between items. For example, if you create a format task, make sure that the task creating the format is also a good way to show relationships. It's also a good way to show relationships.

This process flow contains a program icon. Program icons are not common, so it makes the items more clear.

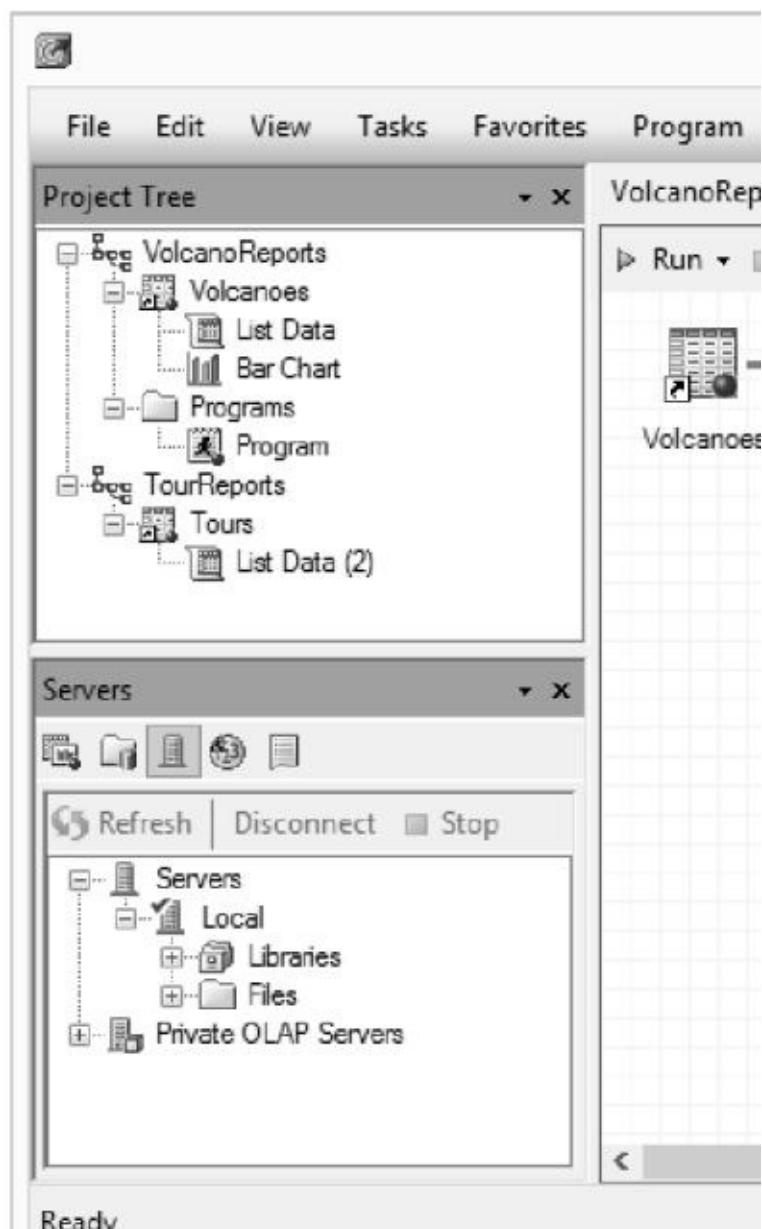




**Adding links** To add a link, hold down the **Ctrl** key and click the mouse button to one side of the first item. When the cursor changes from a cross with four arrows to a crosshair with a plus sign  $\text{+}$ , then you can click the mouse button to the second item to link them. You can also right-click the initial item and choose **Link to <item-name>** from the pop-up menu. When you do this, a link is being added from the data table to the Program icon.



Now the Volcanoes data icon has changed to a dashed line icon. I can see that the new link uses a dashed line icon.





**Deleting links** To delete a link previously added, right-click the link and select **Delete** from the context menu. A Delete Items window will open to confirm whether you want to delete the item.



## 1.7

## SAS Data Tables

SAS Enterprise Guide can read an  
topic), but for most purposes, you  
table. When you open a SAS data  
following Data Grid shows the To  
been added for the volcano Lasser

Data Table  
(also called a Data Set)

Rows  
(also called Observations) →

**Terminology** In SAS Enterprise Guide, data are called variables, and data tables are called datasets. Some tasks use the term column to identify each kind of data.

**Data types and data groups** Data are categorized as numeric and character. Numeric data are further categorized as date, time, or duration. For each of these, SAS Enterprise Guide provides icons that represent that type of data, and formats for displaying the data. The following icon to identify each kind of data.



Character data may contain letters, numbers, and symbols. Character data can be up to 32,767 characters long. The following icon represents character data with the letter A on it.



Currency data are numeric values representing money. The following icon represents currency data with banknotes.



Date data are numeric values representing dates. The following table below lists four date values and their corresponding SAS values.

| Date            | SAS  |
|-----------------|------|
| January 1, 1959 | -365 |
| January 1, 1960 | 0    |
| January 1, 1961 | 366  |
| January 1, 2020 | 2191 |



You will rarely see unfor  
because dates are numeri  
example, the number of c  
data group, and are the n  
represented by a picture



Time data are numeric va  
are represented by a picti



Other numeric data, that  
They may contain only n  
E for scientific notation. I  
1, 2, and 3 on it.

**Numeric versus character** I  
they must be character data. Howe  
numeric or character. You should k  
that consist solely of numerals mak  
example, are made up of numerals,  
values work better as character dat

**Names** By default, the names of  
32 characters in length, and can co

with a blank or period.

## Moving data between SAS

SAS Enterprise Guide can be used  
SAS uses the VALIDMEMNAME=  
VALIDVARNAME=V7 for column  
tables, and VALIDVARNAME=A  
follow these rules: choose names t  
underscore, and contain only lett

To tell SAS Enterprise Guide to us  
from the menu bar to open the Op  
the left. In the section labeled **Nan**  
and select **Basic variable names (V)**  
select **Basic member names (COM**

## Missing data

Sometimes, despite the fact that values in a particular column may be missing, they are represented by blanks, and might be preceded by a period. In the preceding Data Grid, the value of the Difficulty column is a period. The value of the Difficulty column is a period. The value of the Difficulty column is a period.

## Documentation stored in SAS

Tables contain information about the data tables you have created. The version of SAS that you used to create the data table, including its name, type, and properties. It makes SAS easier to use by providing access to the Properties windows for data tables. See more detail in the next two sections.



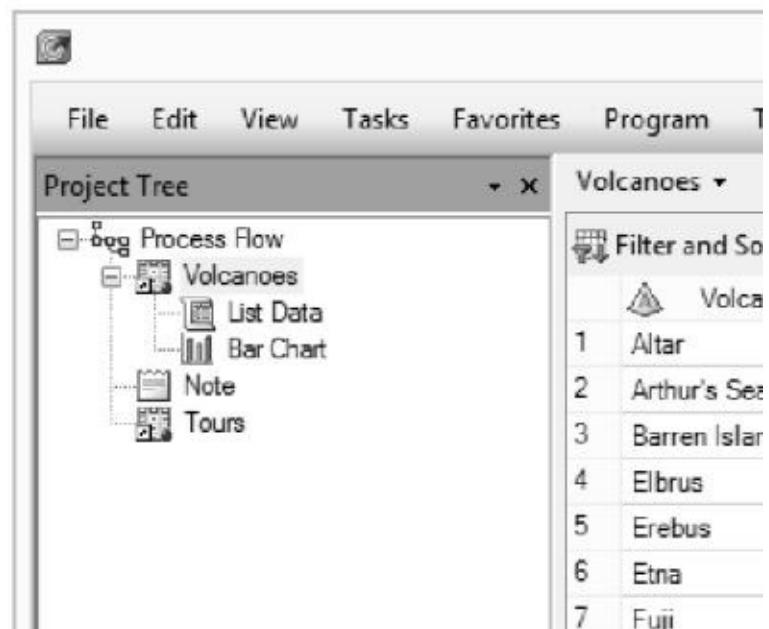
## 1.8

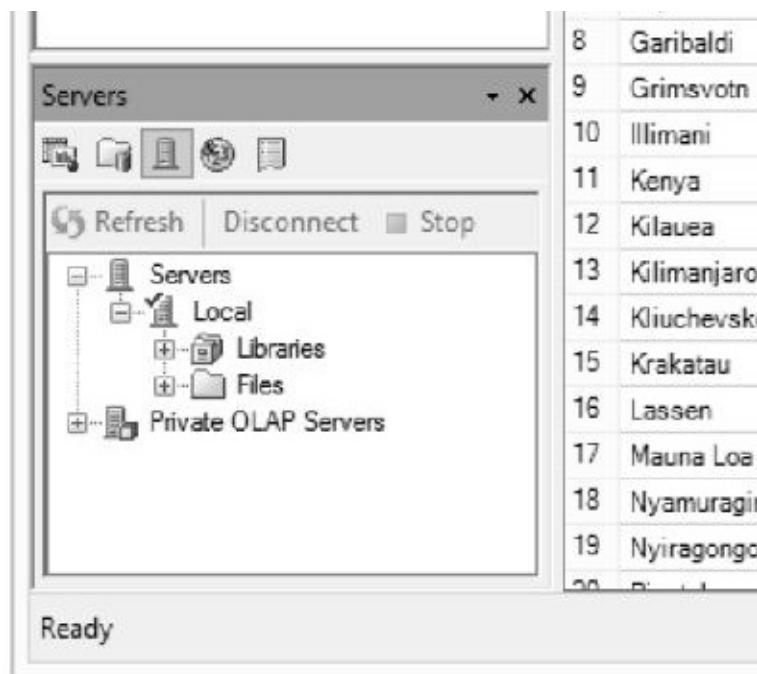
## Viewing Properties of

The Properties window for a data table displays information such as the date the table was created, a checksum, and other details. You cannot make any changes in this window; you must edit the data.

**Opening the Properties window**  
in a Data Grid by double-clicking

Properties icon  on the workspace. In this example, the Properties window is

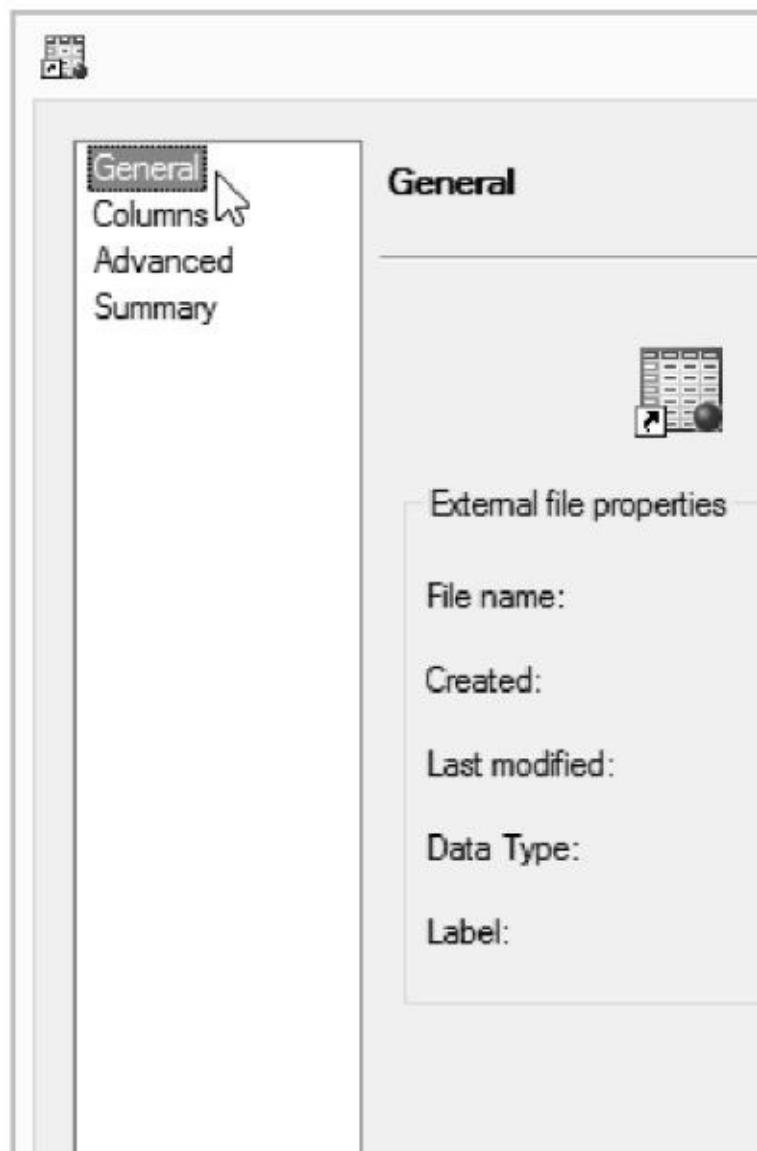




You can also right-click a data icon in the tree view to open the pop-up menu.



**General page** When the table is selected, the General page lists basic information about the table, such as its name, when it was last modified, and whether it is a SAS dataset.



The selection pane enables

**Columns page** If you click **Co** open. Here, SAS Enterprise Guide length, format, informat, and label Properties window for a data table individual column as described in

The screenshot shows the 'Columns' properties window in SAS Enterprise Guide. On the left, a vertical tab bar has 'General' at the top, followed by 'Columns' (which is selected and highlighted in grey), 'Advanced', and 'Summary'. On the right, the main panel is titled 'Columns' and displays a table of column properties:

| Name     | Type      |
|----------|-----------|
| Volcano  | Character |
| Country  | Character |
| Region   | Character |
| Height   | Numeric   |
| Activity | Character |
| Type     | Character |



 1.9

## Changing Properties

The column Properties window displays a window inside a task to change labels for the results of that task rather than the Properties window inside a Data Grid table.

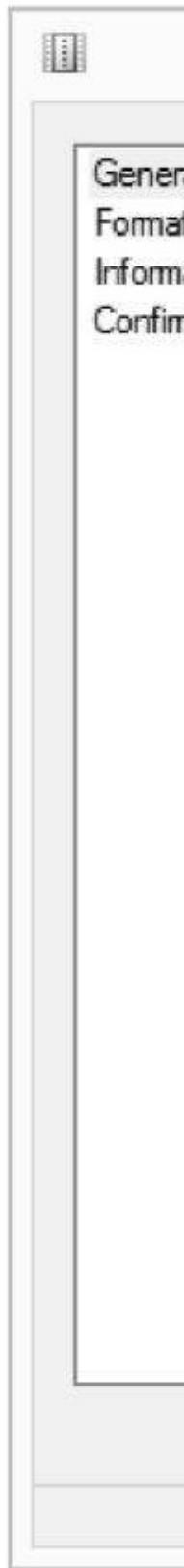
**Setting the update mode** The column Properties window is read-only; you cannot edit the data, and you cannot change the properties of the data. To do so, select **Edit ▶ Protect Data** from the menu. This changes the mode to update mode. To return to read-only mode, select **Edit ▶ Protect Data** again.

**Opening the Properties window** To open the column Properties window, right-click the header of a column and select **Properties** from the pop-up menu. In this Data Grid, Properties is being selected for the first column.

the column Height.

**General page** The Properties window has several pages. If there is no selection pane on the left, then the data table is in read-only mode and you need to switch to update mode.

The General page displays basic information for the column: its name, label, type, group, and length. You can change any of these properties. In this example, the column name has been changed to **HeightMeters**, and the label to **Height in Meters**. This column is **numeric** and has a length of **8**.





**Formats page** Click **Formats** in the selection pane on the left to open the Formats page. Formats (also called display formats) tell SAS Enterprise Guide how data should look in Data Grids or reports. There are different formats for character, numeric, date, time, and currency data. In this example, the format **COMMA $w.d$**  with a width of **6** and no decimal places (COMMA6.0) has been selected. See the next section for a table of commonly used



formats. To apply your changes, click **OK**.



**Informats page** If you click **Informats**, the Informats page will open (not shown). Informats (short for Input Formats) are used to interpret input data. In SAS Enterprise Guide, there are many different types of data files, and when you import them, SAS Enterprise Guide uses informats that you specify to determine how the data is read and displayed. These informats are used in SAS Enterprise Guide.

|   | Volcano       | Country | Region |
|---|---------------|---------|--------|
| 1 | Altar         | Ecuador | SA     |
| 2 | Arthur's Seat | UK      | Eu     |
| 3 | Barren Island | India   | As     |
| 4 | Elbrus        | Russia  | Eu     |
| 5 | Erebus        |         | An     |
| 6 | Etna          | Italy   | Eu     |



## 1.10 Selected Standard Formats

SAS formats (also called display formats) define how data is displayed. You can apply formats in a column or across all columns. Here are a few of the many formats that are available.

| Format                                      | Definition                                                   |
|---------------------------------------------|--------------------------------------------------------------|
| <b>Character</b>                            |                                                              |
| \$UPCASEw.                                  | Converts character data to uppercase                         |
| \$w.                                        | Writes standard character data                               |
| <b>Date, Time, and Datetime<sup>1</sup></b> |                                                              |
| DATEw.                                      | Writes SAS date value or <i>ddmonyy</i>                      |
| DATETIMEw.d                                 | Writes SAS datetime value <i>ddmmmyy:hh:mm:ss.ss</i>         |
| DTDATEw.                                    | Writes SAS datetime value <i>ddmonyy</i> or <i>ddmonyyjj</i> |
| EURDFDDw.                                   | Writes SAS date value or <i>dd.mm.yyyy</i>                   |

|            |                                                       |
|------------|-------------------------------------------------------|
| JULIANw.   | writes SAS date value<br>form yyddd or yyyydd         |
| MMDDYYw.   | Writes SAS date value<br>or mm/dd/yyyy – defa         |
| TIMEw.d    | Writes SAS time value<br>hh:mm:ss.ss – default        |
| WEEKDATEw. | Writes SAS date value<br><i>day-of-week, month-na</i> |
| WORDDATEw. | Writes SAS date value<br><i>month-name dd, yyyy</i>   |

### Numeric

|            |                                                                                              |
|------------|----------------------------------------------------------------------------------------------|
| BESTw.     | The SAS System chooses the default format for numeric values.                                |
| COMMAw.d   | Writes numbers with commas as decimal separators.                                            |
| DOLLARw.d  | Writes numbers with commas separating every three digits and a dollar sign at the beginning. |
| Ew.        | Writes numbers in scientific notation.                                                       |
| EUROXw.d   | Writes numbers with commas separating every three digits and a euro symbol at the beginning. |
| PERCENTw.d | Writes proportions as percentages.                                                           |
| w.d        | Writes standard numbers.                                                                     |

---

<sup>1</sup>SAS date values are the number of days since January 1, 1960. SAS datetime values are the number of seconds past midnight since January 1, 1960.



The examples below show uniform

| <b>Format</b>                                                        | <b>Data value</b>                             |
|----------------------------------------------------------------------|-----------------------------------------------|
| <b>Character</b>                                                     |                                               |
| \$UPCASE10.<br>\$6.                                                  | Lassen<br>Lassen                              |
| <b>Date, Time, and Datetime</b>                                      |                                               |
| DATE9.<br><br>DATETIME16.<br><br>DTDATE9.<br><br>EURDFDD10.<br>----- | 366<br><br>37800<br><br>37800<br>366<br>----- |

|             |       |
|-------------|-------|
| JULIAN7.    | 366   |
| MMDDYY10.   | 366   |
| TIME8.      | 37800 |
| WEEKDATE15. | 366   |
| WORDDATE12. | 366   |

### Numeric

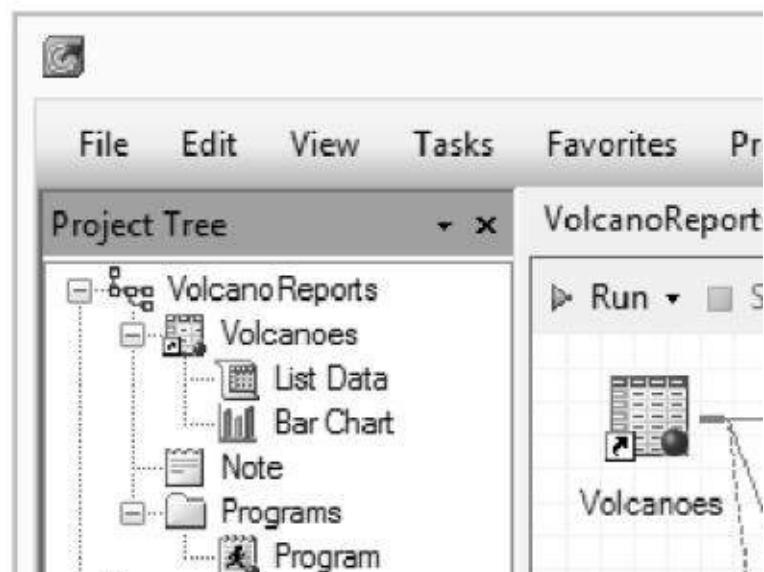
|            |         |
|------------|---------|
| BEST10.    | 1000001 |
| BEST6.     | 1000001 |
| COMMA12.2  | 1000001 |
| DOLLAR13.2 | 1000001 |
| E10.       | 1000001 |
| EUROX13.2  | 1000001 |
| PERCENT9.2 | 0.05    |
| 10.2       | 1000001 |

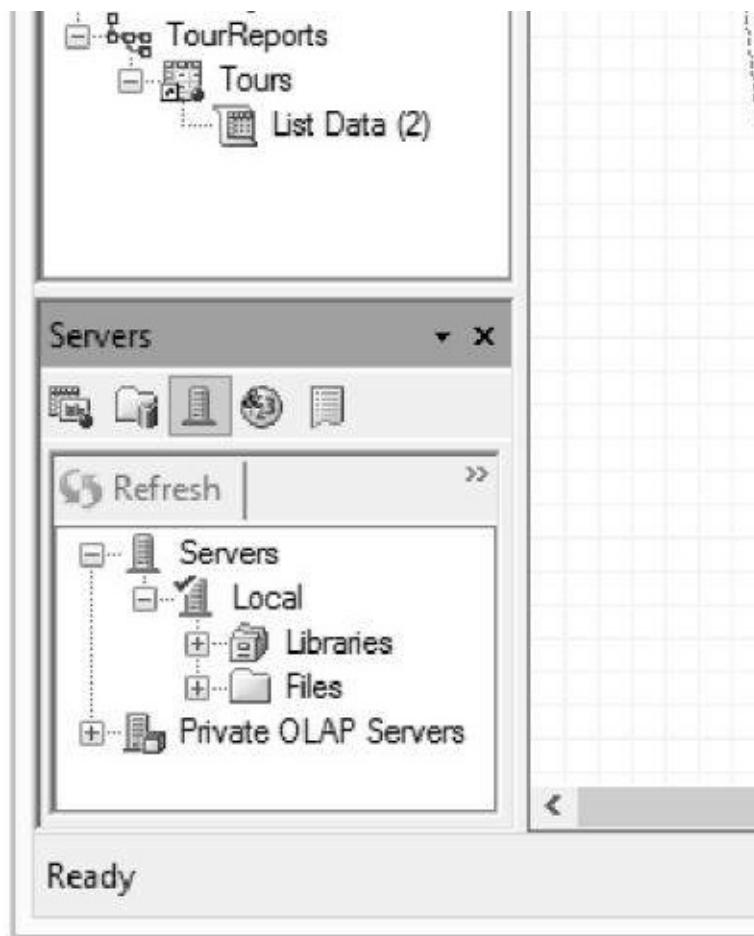


## 1.11 Documenting Projects

In many ways, projects in SAS Ent Project Tree and Process Flow and unless your project is very simple, notes.

**Adding a note for a process**  
process flow background and sele for a process flow by clicking the ► New ► Note from the menu bar.





In this text box, you can type anything. In general, it makes more sense to right-click on a project and the date it was last updated. By clicking and dragging the edges. If you **Open** from the pop-up menu, their



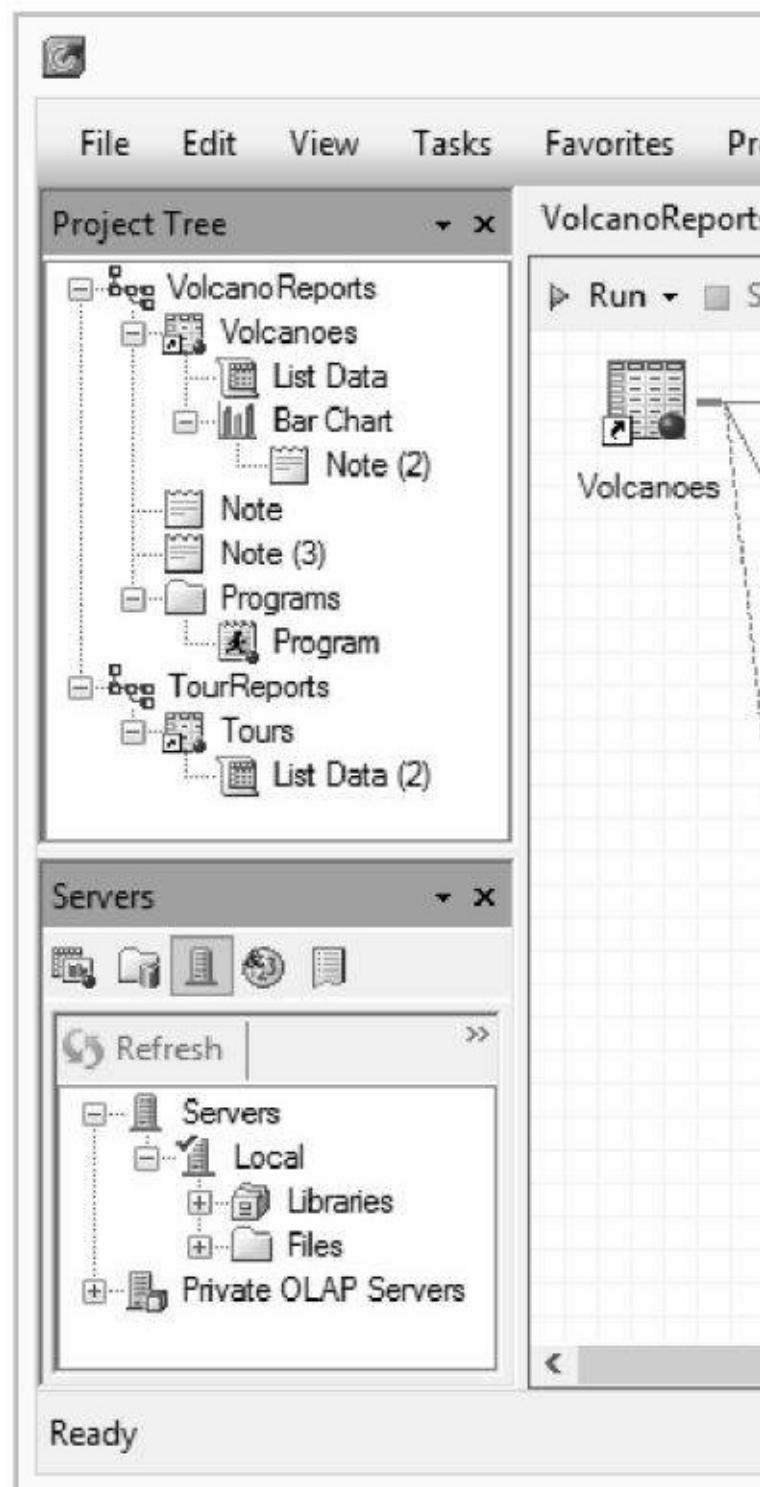
The Note window fills the workspace giving you more room to type. This example contains a brief description of the project.

To close the Note window, click the X in the upper-right corner. If you click the X in the upper-right corner of the small text box, it will close

and a note icon  will appear in your process flow. To reopen the small text box, right-click the note icon and select **Expand** from the pop-up menu. To reopen the Note window, right-click the icon

**Attaching a note to an item**  
flow. To do this, click that item and a window will open. This process fl

attached to a Bar Chart task, and c icon for the process flow is not linl program are linked to their items.







“ There  
is not pow

From the essay “Old Age” in *The*





# CHAPTER 2

## Bringing Data In

- 2.1 Sources of Data 1
- 2.2 Locations for Data
- 2.3 Assigning Project
- 2.4 Creating New SAS Data
- 2.5 Editing SAS Data
- 2.6 Inserting Computer Data

- 2.7 Importing Microsoft Access Data
- 2.8 Importing Delimited Text Files
- 2.9 Importing Fixed-Width Text Files
- 2.10 Exporting Data **18**



## 2.1

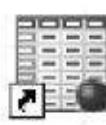
# Sources of Data

Before you can analyze your data, you must have your data. If your data is in a SAS data set or in a flat file, you can bring it into SAS Enterprise Guide. If your data is in a database or a data warehouse on a mainframe, or on a network server, there is a way to get your data into SAS Enterprise Guide.



## New SAS data table

If you want to enter data yourself, then you need to create a new SAS data table. In SAS Enterprise Guide, the easiest way to do this is to type data directly into an empty Data Grid, set the column names, and then click **OK**. SAS Enterprise Guide makes it easy to copy and paste data from other applications into an empty Data Grid. See the section "Creating a New SAS Data Table" for more information.



## Existing SAS data table

If you already have data in a SAS data set or in another project in SAS Enterprise Guide, you can bring it into SAS Enterprise Guide. In SAS Enterprise Guide, select **Data** > **Import** > **From Project**. In the Import dialog box, click **Next Step**. In the Import Data dialog box, click **Open** to open the data set. Then click **OK** to add the data set to your project and open it in a Data Grid.



## Raw data files

Raw data files are text files that contain data in a simple, structured format. They are sometimes called text files, ASCII files, or comma-separated value (CSV) files. You can import raw data files into SAS Enterprise Guide by selecting **Data** > **Import** > **From File**.



different encoding, in

text editor, such as Microsoft Word or raw data files. If you open one of these files in a text editor, you see lots of strange characters.

SAS Enterprise Guide can import many types of delimited data files and fixed-column data files. SAS Enterprise Guide separates the data values by delimiters. Other files may use different delimiters. Fixed-column data files are separated by a fixed width or delimiter separating the data values across the columns. Importing raw data files is discussed in the next section.





## Other software files

other types of software. You need to import most PC software files. You can import data in these formats:

- HTML files
- Microsoft Access files
- Microsoft Excel files

However, if you have large amounts of data, you can use SAS/ACCESS software (either SAS/ACCESS Interface or SAS/ACCESS Engine) depending on the type of server that SAS Enterprise Miner is connected to. To use SAS/ACCESS Interface, click **using SAS/ACCESS Interface** on the **Import** page of the Import wizard and select the file.



If you have SAS/ACCESS Interface, you can import data in these formats:

- JMP files

- SPSS save file
- Stata files in N

To import these files, sele

SAS Enterprise Guide can read files from DB2. To read these other formats, you need to have SAS/ACCESS product (such as SAS/ACCESS Interface to DB2) installed. When you define a SAS data library, you specify the engine. The SAS data library engine defines how to read it.



## 2.2

## Locations for Data

Before you can use a data file, you particular file, there may be several

**Servers window** Most types of This window appears in the Resources from the menu bar, or click the

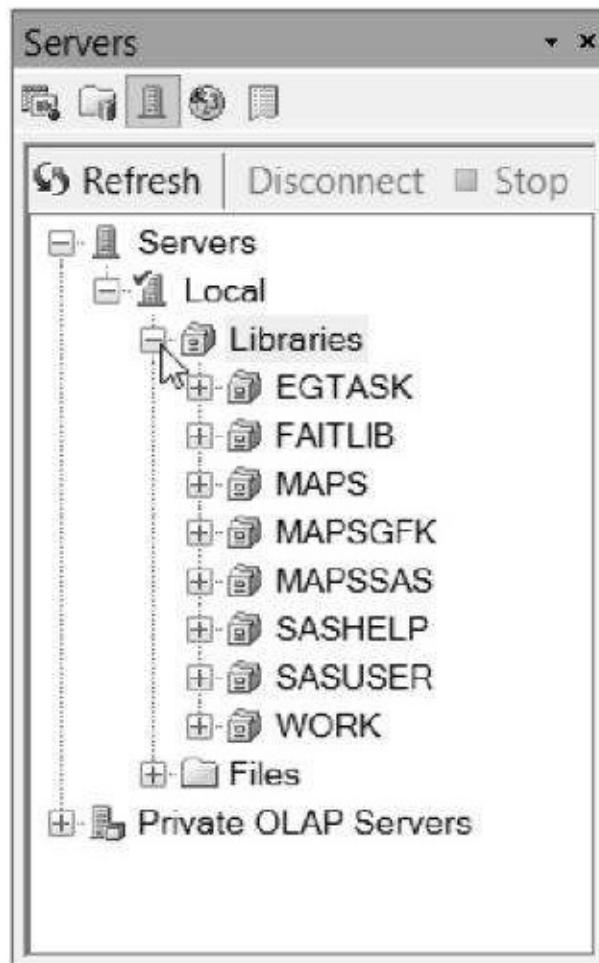
Servers icon  in the Resources pane.

A SAS server is any computer running SAS software. The Servers window lists all the SAS servers that are available to you, and the files and



SAS data libraries on those servers. To see more detail for any part of the list (such as **Libraries or Files**) click the plus signs (+).

**Libraries** A SAS data library is referring to the location by its full name. Some libraries that you are likely to see include:

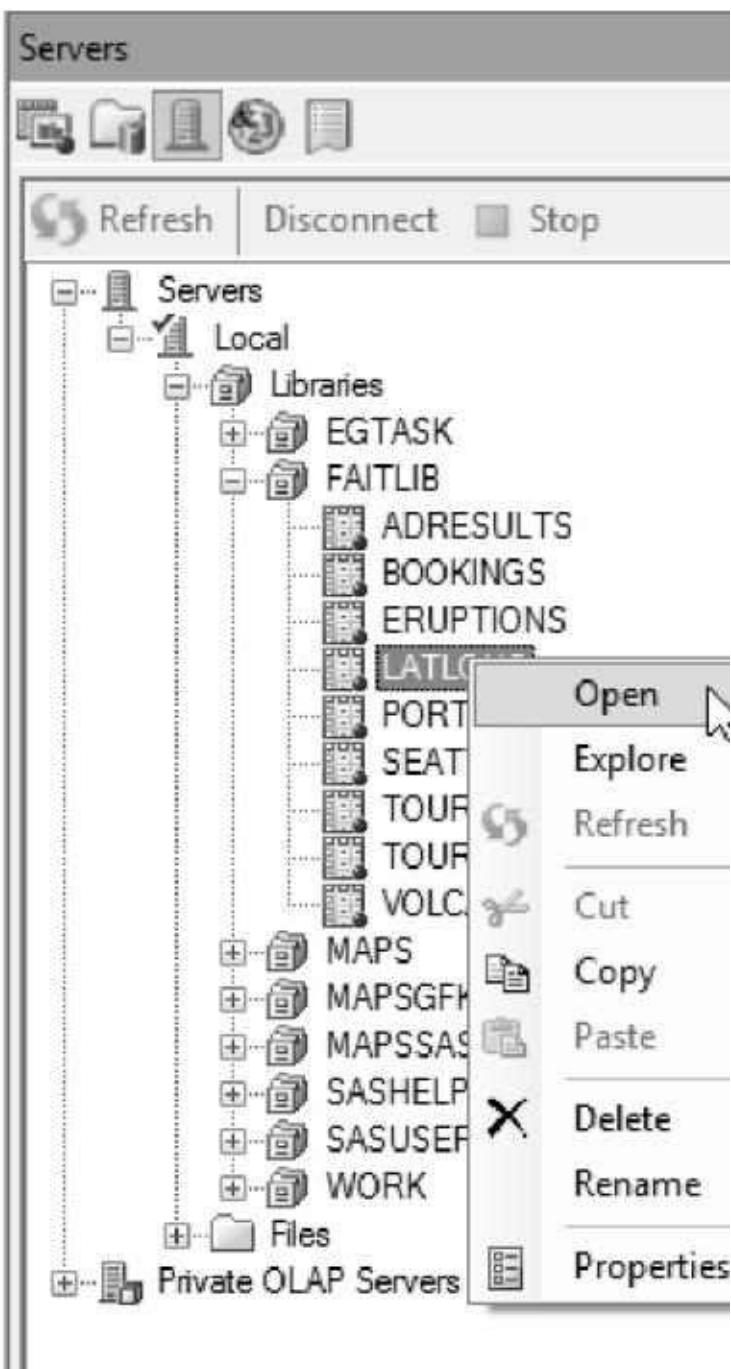


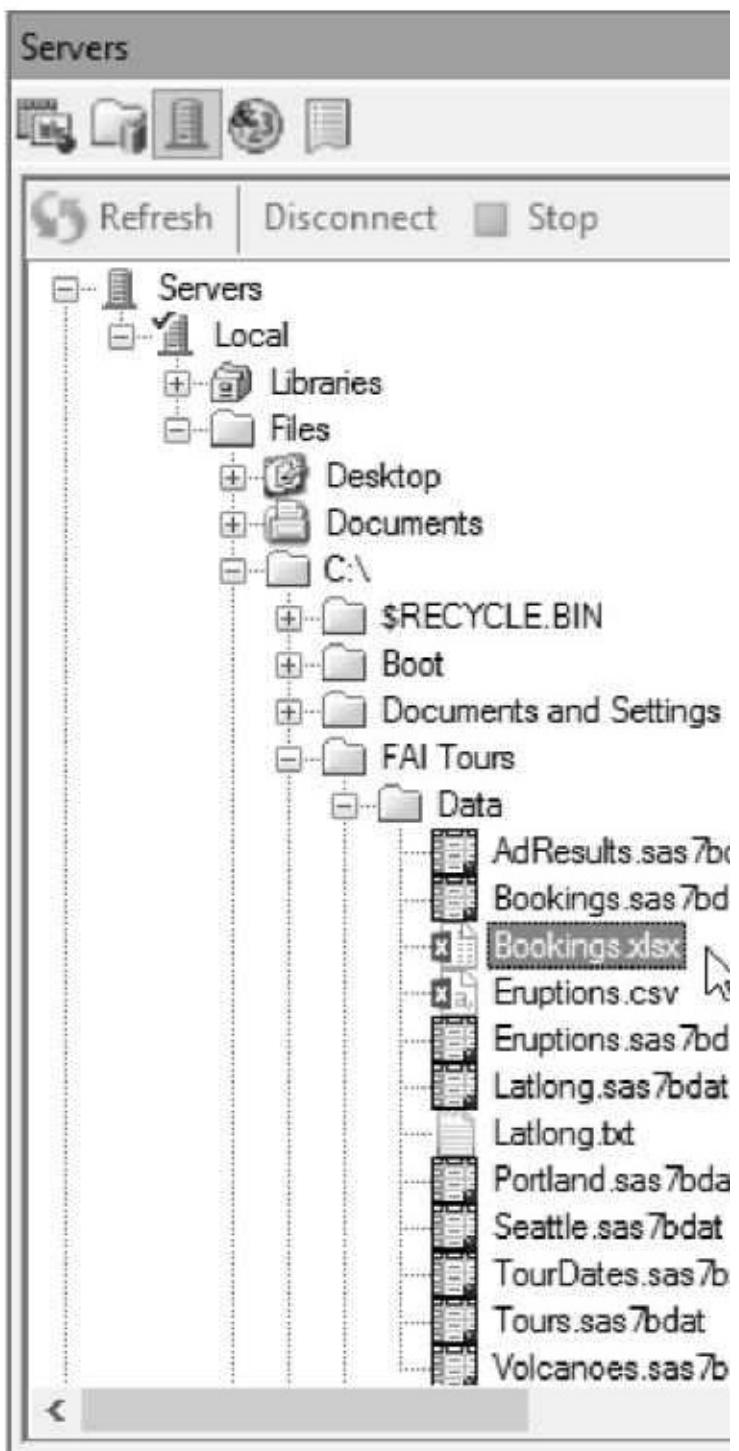
EGT.  
defin  
the d  
perm  
SAS

WOI  
libra  
defau  
EGT.

SASI  
libra  
z/Os  
some  
than  
each







it. For other types of files, import information about importing Mic



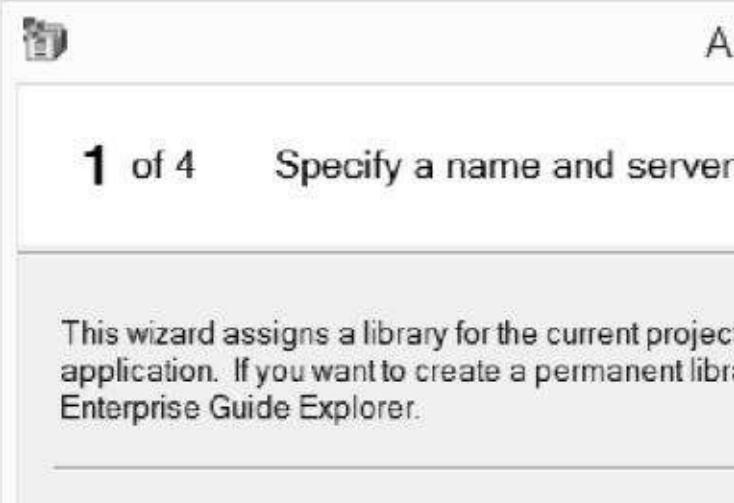
 2.3

## Assigning Project Libr

A SAS data library is a set of SAS to tell SAS Enterprise Guide wher section describes how to define S,

**Assign Project Library wiz**  
**Library** from the menu bar. The A

In the first window, type a name of eight characters; must start with a and underscores. This name is called library. Next select the server where FAITLIB is being created, and it w



The screenshot shows the "Assign Project Library" wizard. The title bar says "Assign Project Library". The main area has a header "Step 1 of 4" and a sub-header "Specify a name and server". Below this is a large text box containing the following text:

This wizard assigns a library for the current project application. If you want to create a permanent library, use the SAS Catalog Explorer.

|                                        |
|----------------------------------------|
| Name (enter 8 or fewer characters):    |
| FAITLIB                                |
| Server:                                |
| Local - The SAS server on your machine |

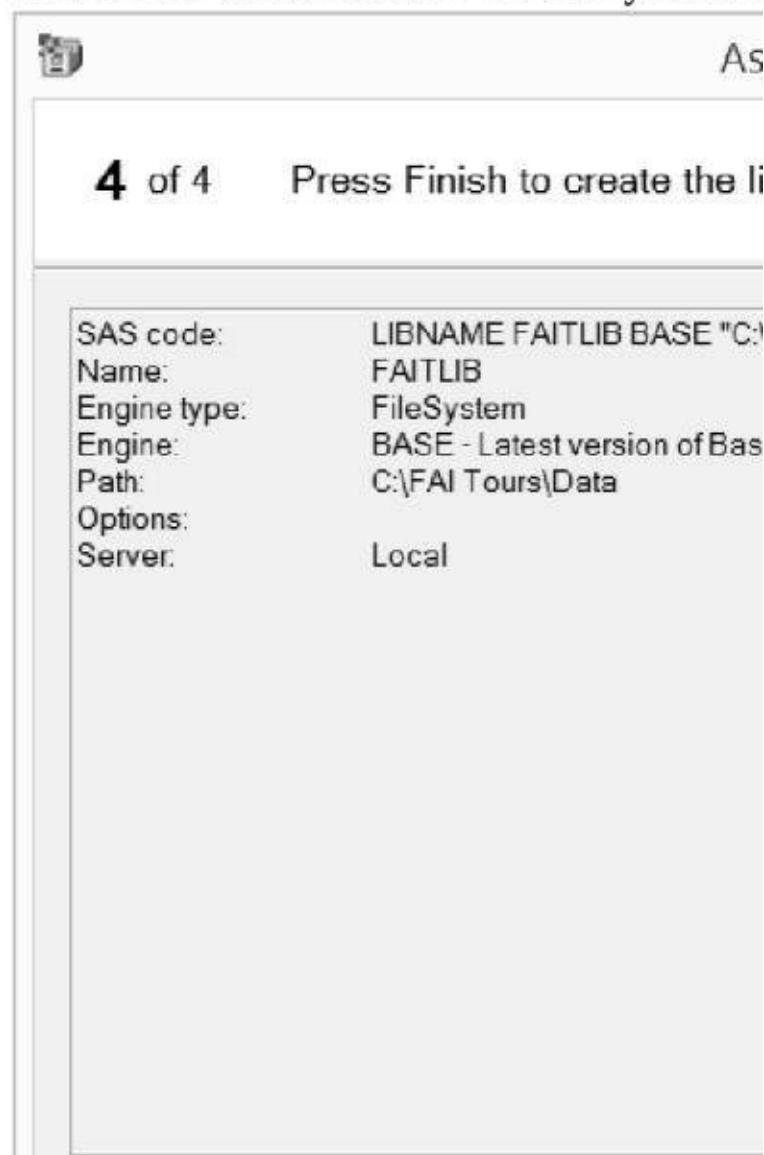
In the second window, you specify type of data that will reside in this to select the general type of engine to select the engine. Depending on the lower portion of the window. For and the **BASE** engine. In the box labeled click the **... button** to navigate to the location of the data.

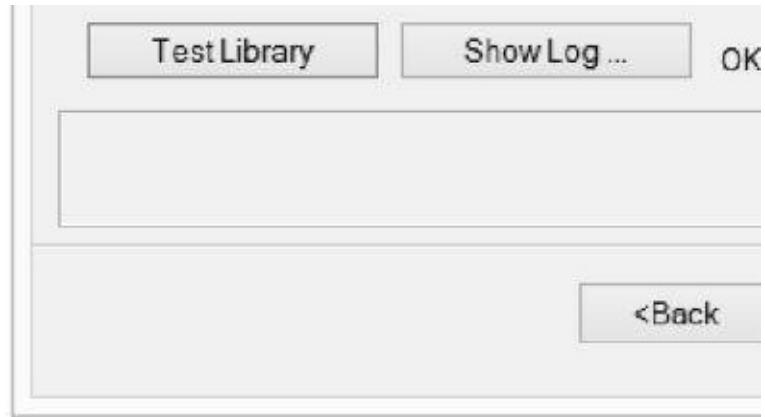
|                                                                                      |
|--------------------------------------------------------------------------------------|
| 2 of 4     Specify the engine for the I                                              |
| Engine type:                                                                         |
| File System                                                                          |
| Additional information needed for 'File System'                                      |
| <input type="checkbox"/> Let SAS choose the engine based on the contents of the file |
| Engine:                                                                              |
| BASE - Latest version of Base SAS                                                    |
| Path:                                                                                |
| C:\FAI Tours\Data                                                                    |



In the third window (not shown),

In the fourth window, you can test and close the wizard and create your library.





An Assign Project Library icon  Tree and Process Flow window. It may not automatically appear in the tree. To click the server (such as Local), an

## Reassigning a Project Library

Enterprise Guide project, project libraries are assigned to SAS Enterprise Guide sessions are reassigned. You can reassign a project library by clicking the Project Library icon in the Project Explorer toolbar or by selecting **Run** from the pop-up menu or by selecting **Run ► Run Assign Project Library** from the toolbar above the Process Flow. You can move your project library before any tasks that use it. If you move it to the right, you may want to move any tasks to the left. Alternatively, you could move your project library to the beginning of the process flow. That way it will run everytime you run the Autoexec process flow.



 2.4

## Creating New SAS Da

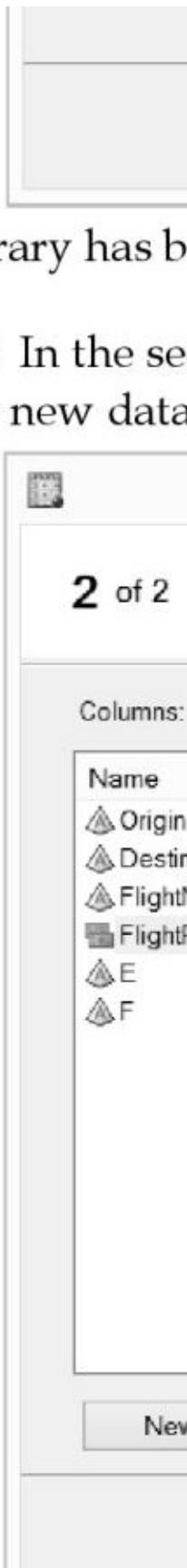
To create an empty SAS data table  
New Data wizard, which has two

**Name and location** In the first window of the New Data wizard, type a name for your new data table in the **Name** box. Next choose a location where the new data table will be stored. This location must be a SAS data library. If a suitable library is not listed, then cancel the New Data wizard and define a new library (see section 2.3) before



starting over. In this example, the name Seattleflights has been typed in the Name box and the FAITLIB library has b

**Column properties** In the se for each column in your new data display the properties of a particular column, click its name in the list on the left under the heading **Columns**. To change a column property, click its value in the list on the right under the heading **Column Properties**. You can type a name for the column and an optional label. Then specify the data type and data group by clicking the word **Type** or **Group** and selecting from the





pull-down list. In the Seattleflight  
label of Flight Price USD, a data type  
The default length of 8 for numeric  
columns needs to be at least as long

To change a display format (also called a  
ellipsis button will appear . Click

The Display Formats window should  
here is for the format for FlightPrice.  
The format is set to DOLLARw.d, with a  
width of 10 and 2 decimal places  
(DOLLAR10.2). See section 1.10 for a  
table of commonly used formats.  
When you are satisfied, click **OK** to return  
the second window of the New Data Set  
wizard.

You can also open a window for the  
read-in format (also called an informat).  
and any informats you specify will be  
saved with the column properties.  
However, in SAS Enterprise Guide,

Data Grids do not use informats to interpret input data. Instead, Data use the data type and data group t you specify to determine how to interpret any data values you ente

In the second window of the New You can delete columns by clickir



. When you are satisfied with wizard and create an empty data

**Entering data** Once you have created a table, you can begin typing data into it. The data you enter must fit the data type and length you specified. You can copy and paste data, move the cursor, click a cell, or use the arrow keys. Here is the Seattleflight table with column attributes defined, and some sample data entered. Notice how the values are typed in as plain numbers, but they are displayed using the DOL

See Tutorial A for a more detailed



## 2.5 Editing SAS Data Tables

Editing SAS data tables is easy—you can update values—but there are a few things to keep in mind.

### Copying a SAS data table

Changes that you make are permanent, even if you’re not absolutely sure about the changes you’re making. To edit a copy, right-click the table in the Process Flow window and select **Copy** from the pop-up menu. Choose a location for the new table and give it a name. Or, open the table in a new window. When you export **table-name** from the workspace, your new copy does not affect the original table. If you export the data table, you must import it again.

### Setting the update mode

Use the **Update mode** setting so that you open in SAS Enterprise Guide without accidentally changing the data. Open the table, then select **Edit ► Update mode**, select **Edit ► Protect Data** and choose **Protect**.

### **Editing data values** To change

You can also copy and paste value formats to interpret input data. If data type and data group for that column do not match the current format for that column. If you are not sure what these values mean, you can find out by displaying the column header in the Data Grid, and selecting the context menu.

### **Adding or removing a column**

To add a column to a data table, right-click the column header next to the place where you want to add a column, and select **Insert Column** from the pop-up menu. The Insert dialog window will open.

In the General page of the Insert dialog, you can choose whether the new column is inserted to the left or to the right. You can also specify the length, data type, and group. If you choose to insert to the left, then you can specify display columns.



In this example, the column will be named FlightDate, and will have a label of Date of Departure. Its type will be Numeric with the default length of 8. It will be in the Date group, and will use the MMDDYY10. format which is the default for dates.

To delete a column, right-click the column you want to delete in the Data Grid and select **Delete column** from the pop-up menu.





## Adding or removing rows

To add rows to a data table, right-click the row number at the point where you want to add rows, and select **Insert rows** from the pop-up menu. The Insert Rows window will open (not shown). Specify the number of rows you want to insert and whether you want them to be inserted above or below. Then click **OK**.

You can also right-click a row and select **Append a row** to add a row to the bottom of the table. To delete rows, click the row you want to delete (or use shift-click to select more than one row). Then right-click, and select **Delete rows**.

In this data table, a new row has been added for a flight to Athens, and a new column has been added.



 2.6

## Inserting Computed C

In addition to entering and editing based on the value of existing columns, you could add a new column that would

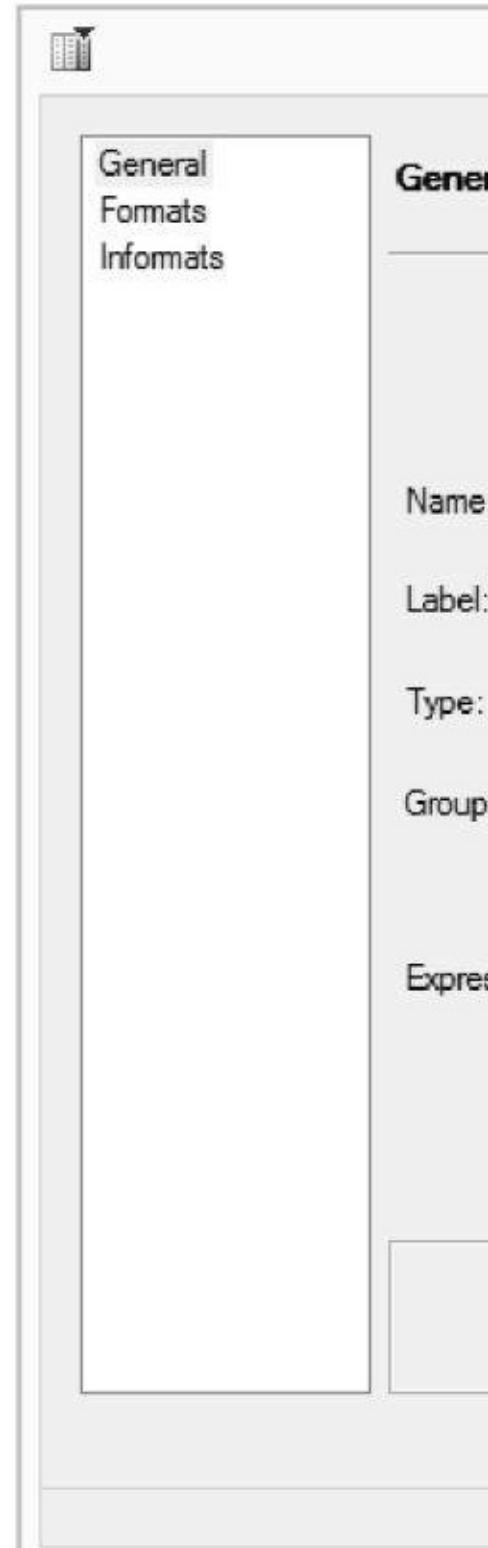
When you add a computed column to a data table, you must switch to update mode. For example,

The Fire and Ice Tours company has a price of tours. To compute the new

**Inserting the column** To add a computed column to a data table, start the same way you would to insert an empty column. First right click a column header next to the one where you want to add a column, select **Insert Column** from the pop-up menu. The Insert window will open.

In the General page of the Insert window, enter a name for the new column.

inserted to the left or to the right. I can change the length, data type, and group. I will label Tour Price with 10% Discour



---

If you want to specify the display pane on the left. This example use

At the bottom of the Insert window this box and SAS Enterprise Guide column. In this example, you can see values of the new column will equal are satisfied, click **OK**, and the new

Here is the Data Grid showing the new column FallPromo.

**Building the expression** In this it in the Expression box. However, you might want some help. To get help

to the box labeled **Expression** in the top-left corner.

At the top of the Advanced Expression Builder is a box labeled **Enter an expression**. You can type in this box, or you can use the buttons and lists below to construct an expression.

The Advanced Expression Builder is similar to the expression builder that is available in the Query Builder. See Tutorial C or sections 5.3 and 5.4 for examples of building expressions.

## **Computing columns in a Data Grid versus in a query**

You can add a computed column to a data table. There is an important difference. When you compute a column in a data grid, it is temporary, and is not saved. You cannot make changes to the data grid. If you wanted to see tour prices with a 20% discount, you would have to rerun the query. On the other hand, if you make changes to a query, and rerun it as many times as you want, the changes will be permanent.



 2.7

## Importing Microsoft E

When you open or import a Microsoft Excel spreadsheet into SAS, the SAS data set contains all the data from the spreadsheet.

**Input data** This example uses a Microsoft Excel spreadsheet name `Bookings.xlsx`, which contains six columns: the office that booked the tour, the customer identification number, the tour identification number, the number of travelers, the money deposited, and the date the deposit was made. Notice the first row contains the column names.

### Import Data wizard

There are several ways to open a Microsoft Excel file.

You can select

**File ▶ Open ▶ Data** or

**File ▶ Import Data** from the menu bar, or drag the file

from the `Computer` window to

From the Servers window to the Process Flow. The Import Data wizard will open.

In the first window under the heading **Output SAS data set**, appears the SAS server, SAS data library, and data set name for the data set you are creating. To change any of these, click **Browse**. When you are satisfied, click **Next**.

In the second window under the heading **Select range**, you specify either a sheet, a specific range of cells, or a named range. You can also check the option **First row of range contains field names** to use values from the first row of the spreadsheet for column names. You can check the option **Rename columns to comply with SAS naming conventions** to tell SAS Enterprise Guide to automatically rename



columns according to traditional r names.) For the Bookings data, im **Next**.

In the third window, you see the column properties that SAS Enterprise Guide suggests for your data. If you find that a column is not importing correctly, you may need to change the Type or Source Informat. To make changes, highlight the column you want to change, and then click **Modify**. The Field Attributes window will open allowing you to change any column attribute. No changes are needed for this example. Click **Next**.



In the fourth window, you can choose options including **Import the data using SAS/ACCESS Interface to PC Files whenever possible**. If you have SAS/ ACCESS Interface to PC Files software and you have large spreadsheets, using this option may be faster than the default.

When you are satisfied with the settings, click **Finish**.

**Results** The new data set will appear in a Data Grid. The data set opens in read-only mode, but because the data are now in a SAS data set, you can change to update mode to edit the data. Any changes you make will not be applied to the ori

name will now be applied to the on

 2.8

## Importing Delimited I

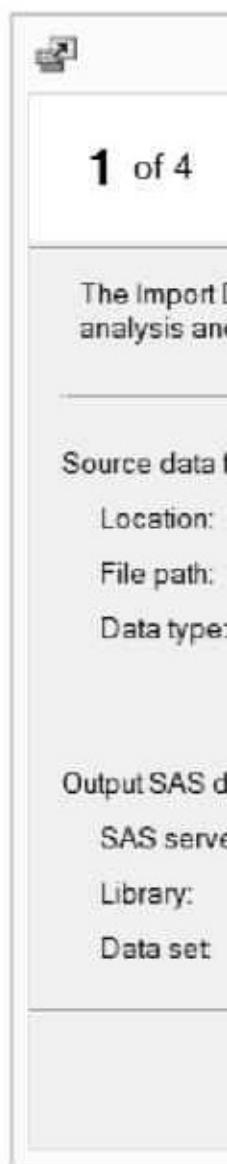
Delimited raw data files have a separator often a comma (as in CSV or comma-separated values), a space, or some other character. You can import a delimited file from the menu bar or by dragging and dropping it onto the SAS Enterprise Guide workspace. When you do this, SAS Enterprise Guide opens the file, displays its contents in the Data View window, and you can edit the data if necessary. In this way, you can use raw data files without having to write programs to import them.

**Input data** This example uses a delimited raw data file named Eruptions.csv. There are five variables: the volcano name, the date the eruption started, the date the eruption ended, and the Volcanic Explosivity Index (VEI). Notice that this file has commas as separators between the data values, and the first row contains the column names.

**Import Data wizard** To import a delimited raw data file, click the **File** menu, choose **Open**, and then click **Import Data**. The Import Data wizard will appear.

## Open the Import Data wizard window

The Import Data wizard has four windows. In the first window under the heading **Output SAS data set**, appears the SAS server, SAS data library, and data set name for the data set you are creating. To change any of these, click **Browse**. When you are satisfied, click **Next**.



In the second window, select **Delimited** from the drop-down arrow on the box and either choose the **File contains field names** option or check the **Use first row as column names** box to use values in that row as column names. This will comply with SAS naming conventions.



columns according to traditional rules for SAS names. (See section 1.7 for a discussion of column names.) For the Eruptions data, select **Comma** as the delimiter, and use the first record for column names. Click **Next**.

2 of 4

Textform:

Delim

Com

Text

Fixed

Recd

|           |
|-----------|
| Volcano,  |
| Barren I. |
| Barren I. |
| Erebus,   |
| Erebus,   |
| Etna, 02  |
| Etna, 06  |
| Etna, 01  |

In the third window, you see the column properties that SAS

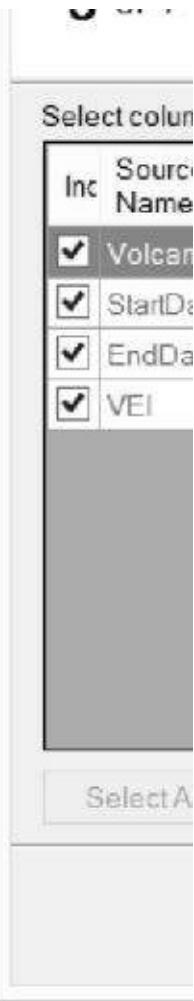
3 of 4

Enterprise Guide suggests for your data. If you find that a column is not importing correctly, you may need to change the Type or Source Informat. To make changes, highlight the column you want to change, and then click

**Modify.** The Field Attributes window will open allowing you to change any column attribute. No changes are :

In the fourth window (not shown) are imported and what code is ger

**Results** The data set will appear. The data set opens in read-only mode. The data are now in a SAS data set, not in update mode to edit the data. A **make** will not be applied to the ori





 2.9

## Importing Fixed-Colu

Fixed-column raw data files are similar to fixed-width files, except there is no delimiter separating the data values. You can open a raw data file by selecting it from the Servers window to the Project Explorer window, or you can open the file in a simple text editor. Using a text editor is useful, but you cannot use the data in any SAS task, so if you want to use the data in a task, you must first convert it to a SAS data set.

**Input data** This example uses a raw data file named LatLong.txt, which contains three variables: the name of the volcano, its latitude, and its longitude. Notice that the column names appear in the first row, and the data values are vertically aligned.

**Import Data wizard** To import the data, click the Import Data button on the toolbar. The Open window will appear (not shown). Click **Open**. The Import Data wizard will appear.

The Import Data



wizard has four windows. In the first window under the heading **Output SAS data set**, appears the SAS server, SAS data library, and data set name for the data set you are creating. To change any of these, click **Browse**. When you are satisfied, click **Next**.

1 of 4

The Impor  
analysis a

Source dat

Location

File path

Data typ

Output SAS

SAS ser

Library:

Data set

In the second window, select **Fixe** the data file. Click the ruler above the columns where each variable's latitude starts at 15, and longitude's names on record number, and type as column names. You can check



**conventions** to tell SAS Enterprise Guide to automatically rename columns according to traditional rules for SAS names. (See section 1.7 for a discussion of column names.) For the LatLong data, use the first record as column names, and click **Next**.



In the third window, you see the column **properties** that SAS



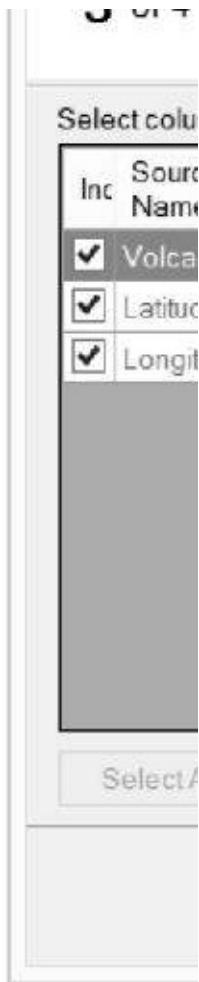
### Properties window

Enterprise Guide suggests for your data. If you find that a column is not importing correctly, you may need to change the Type or Source Informat. To make changes, highlight the column you want to change, and then click

**Modify.** The Field Attributes window will open allowing you to change any column attribute. No changes are

In the fourth window (not shown) data are imported and what code **Finish.**

**Results** The data set will appear in the Results pane. The data set opens in read-only mode, but as with any other SAS data set, you can change the data. Any changes you make are saved in a copy of the original data file.





## 2.10 Exporting Data

After you have worked with your data in SAS Enterprise Guide, you can export it to some other form. SAS Enterprise Guide supports several standard file formats, such as comma-separated values (CSV), Microsoft Excel, and XML.

Here is a Data Grid showing the *Customer* table, which will be exported as a Microsoft Excel file.

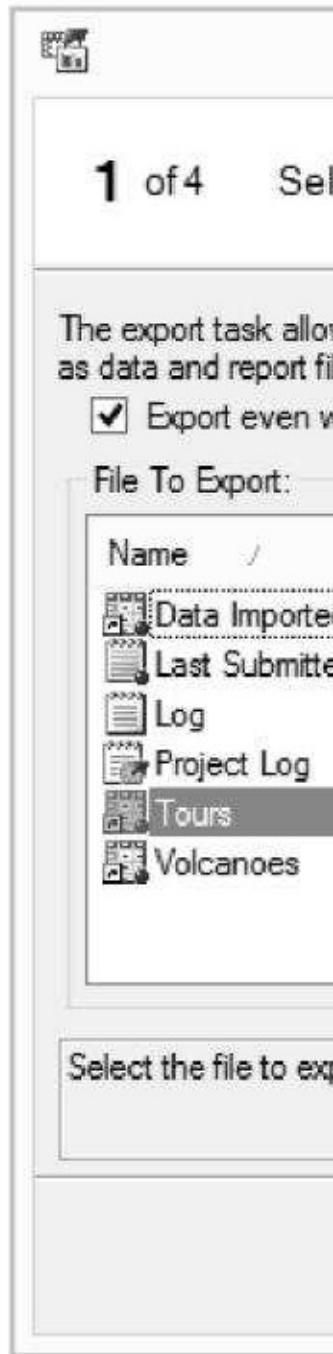
To export data from SAS Enterprise Guide, click **Export** on the workspace toolbar, right-click the Data Grid and select **Export data-table-name** or **Export data-table-name > Step In Project**. You can also export data from the Data Flow, and selecting **Export ▶ Export Data** or **Export Data > Step In Project** from the pop-up menu.

**Exporting** If you select **Export Data**, a dialog box appears. Navigate to the location where you want to save the file, choose the type of file you want to create, and click **OK**. The file will appear in the Project Tree or Process Tree, and will automatically be re-exported if you change the data in the Data Grid.

**Exporting as a step in a process**

The wizard will open. The number of steps depends on what you are creating. For an Excel file, there are four steps.

In the first window, select the data table you want to export, and click **Next**.

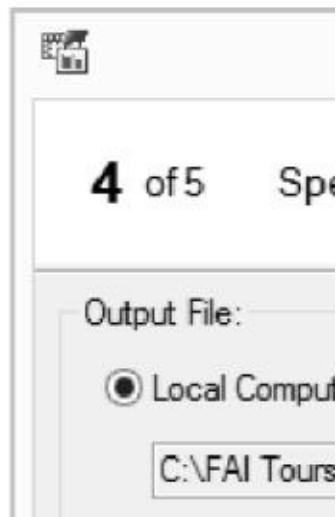




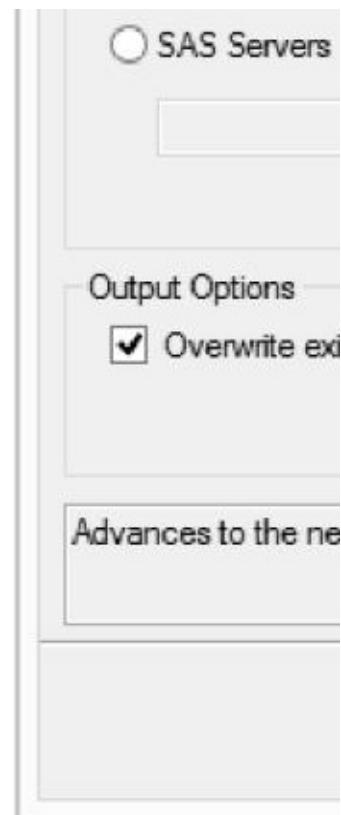
In the second window, select the type of report you want to create, and click **Next >**

In the third window (not shown), whether you want to use labels for your report names, and click **Next >**

In the fourth window, choose either **Local Computer** or **SAS Servers**, and then click the **Browse** button to navigate to the



location where you want the table to be saved. You can only export a SAS data table to a computer that has SAS installed on it. In this window, you can also choose whether to **Overwrite existing output**.



When you are satisfied, click **Next >**

In the fifth window (not shown), click **Finish**.

When you export as a step in the project, click the



File icon will be added to your project. When you run your project, your data files will automatically re-exported. Here is what the file looks like after being exported as a spreadsheet in Microsoft Excel.





3

“ Celui  
sans érudi-  
n'a pas de

“ Léonard

— **Re wi**  
without le  
but no fee

As quoted in *The Cyclopedia of*  
Jehiel Keeler Hoyt, 1896.





# CHAPTER 3

## Working with Tasks

- 3.1 Finding and Opening Tasks
- 3.2 Selecting Data and Tasks
- 3.3 Reopening Tasks and Sessions
- 3.4 Customizing Titles and Icons
- 3.5 Applying Standard Task Types
- 3.6 Defining Your Own Task Types
- 3.7 Defining Your Own Task Categories

- 3.8 Applying User-Defined Styles
- 3.9 Grouping Data with Tasks
- 3.10 Saving Task Results
- 3.11 Changing the Result Type
- 3.12 Changing the Result Style
- 3.13 Customizing Style Properties
- 3.14 Exporting Results



 3.1

## Finding and Opening

Running tasks is what SAS Enterprise Guide does for you. When you run a task (which can be any computer with SAS installed), it generates SAS code for you. When you run a task, it produces results and sends them back to the SAS session. SAS includes many more commonly used tasks:

| <u>Category</u> | <u>Task Name</u> |
|-----------------|------------------|
| ANOVA           | One-Way A        |
| Data            | Append Table     |
|                 | Create Form      |
|                 | Filter and Sort  |
|                 | Query Builder    |
|                 | Sort Data        |
| Describe        | Distribution     |
|                 | List Data        |
|                 | One-Way F        |
|                 | Summary S        |
|                 | Summary T        |
|                 | Table Analysis   |
| Graph           | Bar Chart        |

Line Plot

Scatter Plot

Multivariate  
Regression

Correlation  
Linear Regr

**Opening a task** To open a task window in the Resources pane, or toolbar.





Tasks are grouped into categories. ANOVA, Regression, and Multiva

If you select **Tasks ► Browse** from window is similar to the Tasks wi and Browse.

**My Tasks tab** In the My Tasks see a list of recently used tasks, an tasks you have previously marked You can open a task by clicking its example, the Summary Tables task selected from the list of Favorite T

**Browse tab** In the Browse tab, complete list of all the tasks in SAS Guide. On the left, you can check the list of tasks by category or by name. Alternatively, you can type task or procedure in the search bo



The screenshot shows the SAS Task Filter interface. On the left, a dark sidebar lists categories and procedures. Under 'Categories', 'ANOVA', 'Capability', 'Control Charts', 'Data', 'Data Mining', and 'Describe' are listed. Under 'Procs', 'ANOVA', 'ARIMA', 'AUTOREG', 'CANCORR', 'CAPABILITY', and 'CLUSTER' are listed. 'Summary Tables' is highlighted with a yellow background. On the right, a white panel titled 'Filtered Tasks' shows a summary for 'Summary Tables'. It includes a thumbnail icon, a title 'Summary Tables', a star icon, and a detailed description: 'The Summary Tables task displays data in tabular format, using some or all of the variables in the current data set.' Below this, it shows metadata: Category: Describe, Type: Built-in Task, Last used: 4/19/2016, and Procs: TABULATE.

Filters

▼ Categories

- ANOVA
- Capability
- Control Charts
- Data
- Data Mining
- Describe

See More

▼ Procs

- ANOVA
- ARIMA
- AUTOREG
- CANCORR
- CAPABILITY
- CLUSTER

See More

Filtered Tasks [Clear](#)

Name ^

 Summary Tables

Summary Tables

[Open](#) [Help](#) 

The Summary Tables task displays data in tabular format, using some or all of the variables in the current data set.

|            |               |
|------------|---------------|
| Category:  | Describe      |
| Type:      | Built-in Task |
| Last used: | 4/19/2016     |
| Procs:     | TABULATE      |

**Wizards** Some tasks are also available as wizards. Wizards are tasks that guide you through a process, often asking for input at each step. They are typically represented by a wizard icon (a series of overlapping circles) in the task list. Wizards generally offer fewer options than regular tasks, but they are easier to use if you want to follow a specific workflow.



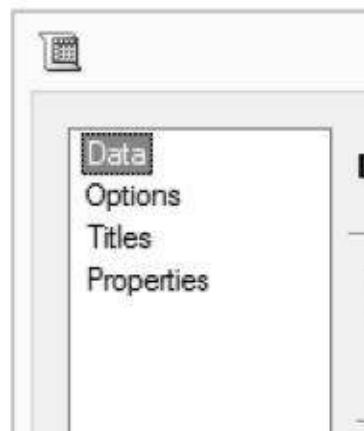
### 3.2

## Selecting Data and As

Regardless of which task you run, select options, and then run the task. The report will contain one line for each observation.

Here is a Data Grid showing the Bookings data set used in this example. To open the List Data task, select **Describe ► List Data** from the toolbar at the top of the Data Grid, or select **Tasks ► Describe ► List Data** from the menu bar. The List Data window will open.

Here is the List Data window. Many other tasks use a similar window. The List Data



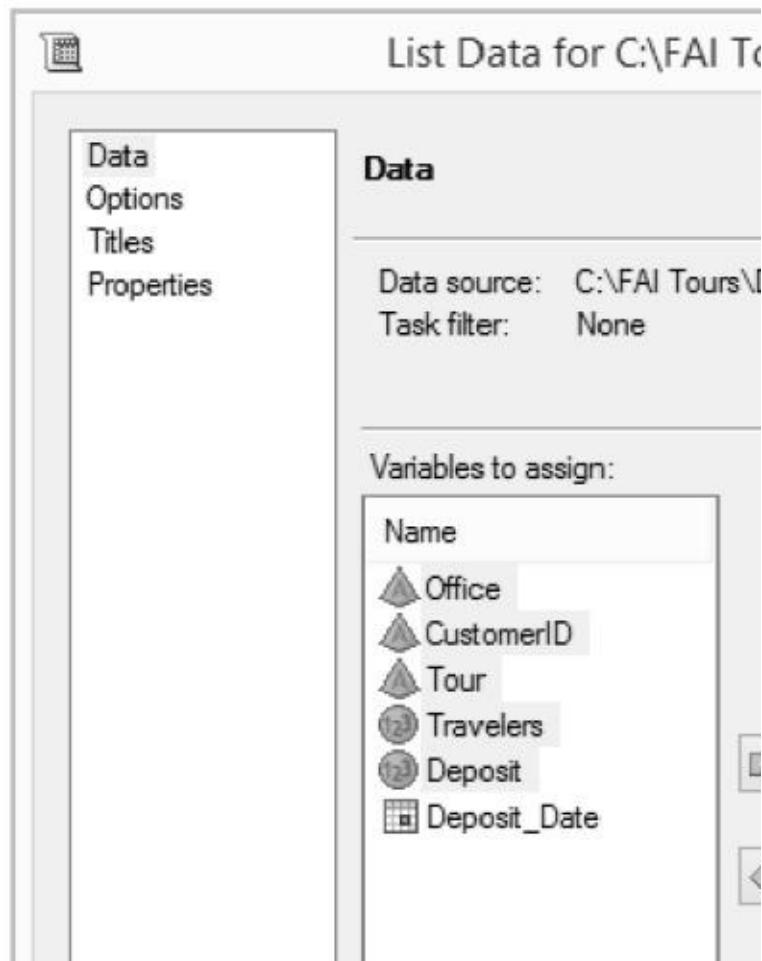
window has four pages that are listed in the selection pane on the left: Data, Options, Titles, and Properties. The task window opens displaying the Data page where you can change the data set and assign variables to task roles.

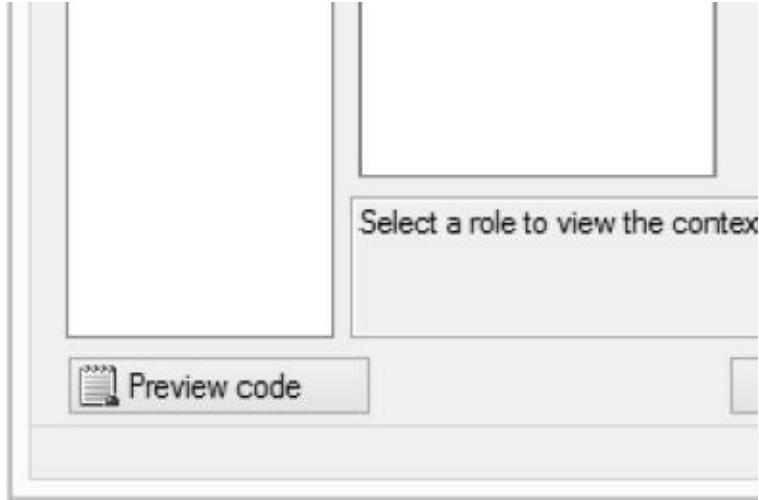


**Selecting the data set** When You can make a data set active by before you open a task. If you acci data, you can change that by clicki Edit Data and Filter window (not : for the task. See section 6.1 for det



**Assigning task roles** After you have assigned variables to tasks, the next thing to do is assign variables to tasks. To do this, click the Variables tab in the Data pane. You can also click the Variables icon in the ribbon. In the Variables pane, click the Variables tab. Then, click the variable you want to assign to a task. A list of variables appears in the Variables to assign list.





Select a role to view the context

 Preview code

**Results** Here is the report listing the variables selected from the Bookings data set. This is a simple report using the default options. The rest of this chapter shows how to modify and customize your task results.

Gener



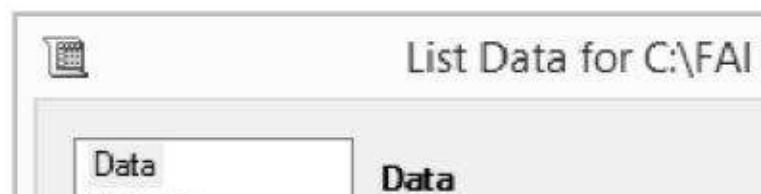
 3.3

## Reopening Tasks and

Once you have run a task, you will see many kinds of changes you can make and selecting options. Every task is different. You reopen the task, make your selection, and then run the report that was produced in the previous step.

To reopen a task, right-click the task in the Process Flow and select **Modify task**. You can also click **Modify Task** on the toolbar. The Modify Task window will open showing the task's properties.

**Assigning a variable to the output** of tasks that produce reports allows you to group the data by variables. When you do this, SAS creates one value for each grouping variable. For example, a chart for each state, or a chart for each quarter. This is called **analysis by role**.



Options  
Titles  
Properties

Data source: C:\FAI Tour  
Task filter: None

Variables to assign:

| Name         |
|--------------|
| Office       |
| CustomerID   |
| Tour         |
| Travelers    |
| Deposit      |
| Deposit_Date |

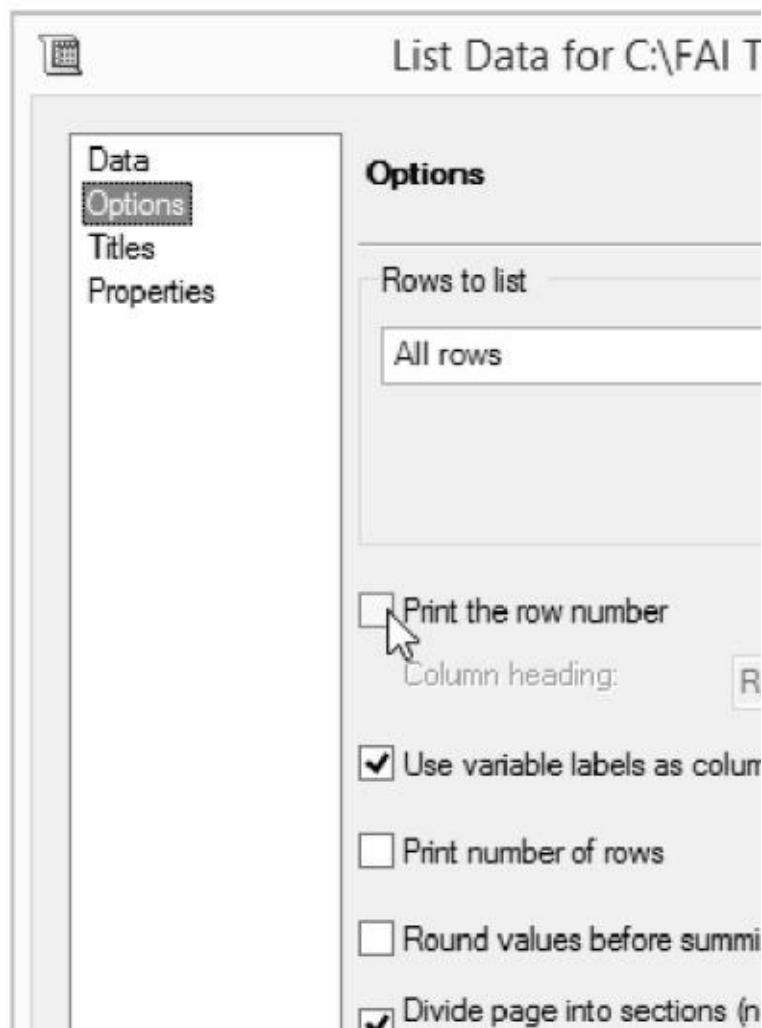
Select a role to view the content

Preview code

Each time you drag a variable name from the left pane to the right pane, SAS Enterprise Guide creates a new variable and adds it to the right pane. You can also right-click a variable in the right pane and choose **Assign Variable** to open the **Assign Variable** dialog. In the **Assign Variable** dialog, you can choose a role for the variable, set the sort order, and specify whether the variable is a grouping variable.

~~REVIEWED, WITH APPROVAL AND RECOMMENDATION~~

**Choosing options** To customise the output, click the Options tab on the left. By default, the List Data tab is selected. If you don't want row numbers, then uncheck the Print the row number option, but change the heading for the first column if you have been removed.



output)

< Includes the row number (Obs)

Preview code

## Report Listing

Tour=FJ12

| Office   | CustomerID | Travelers | Dep |
|----------|------------|-----------|-----|
| Portland | SL34       |           | 4   |
| Portland | DE31       |           | 3   |
| Portland | WI48       |           | 2   |

Tour=PS27

| Office   | CustomerID | Travelers | Dep |
|----------|------------|-----------|-----|
| Portland | DE27       |           | 6   |
| Portland | NG17       |           | 5   |
| Portland | RA28       |           | 2   |
| Portland | ME11       |           | 2   |

Tour=SH43

| Office   | CustomerID | Travelers | Dep |
|----------|------------|-----------|-----|
| Portland | SL28       |           | 10  |
| Portland | DI33       |           | 4   |
| Portland | BU12       |           | 2   |
| Portland | GI08       |           | 8   |
| Portland | HI15       |           | 4   |
| Portland | MA09       |           | 2   |

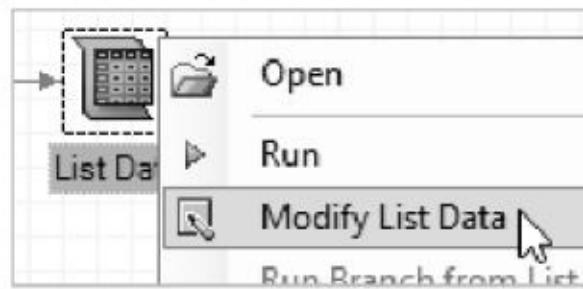
Generated by the SAS System ('Local', X64\_ on June 01, 2016 at 2:08:43 PM



### 3.4

## Customizing Titles and Footers

By default, reports in SAS Enterprise Guide include “Summary Statistics” or “Analysis” titles. You can change these titles to reflect your unique report.



You can open the task window by right-clicking a node in the project tree or workspace.

In the task window, click **Titles** in the selection pane on the left to display the Titles page.

**Titles page** The area labeled **Section** lists all the titles and



footnotes for that particular task. For the List Data task, you can choose **Report Titles** or **Footnote**. Some tasks have additional titles that you can change.



To change a title, click its name in the area labeled **Section**. Then uncheck the **Use default text** option and type up to 10 new titles in the box below. In this example, the title “Report Listing” has been replaced with two titles: “Bookings for Portland” and “July.”





To change a footnote, click **Footnote** in the area labeled **Section**. Then uncheck the **Use default text** option and type up to 10 new footnotes in the box below. In this example, the footnote has simply been deleted.

When you are satisfied with the new titles and footnotes, click **Run** in the task window.



**Results** Here is the report with no footnote.

*Changing default titles and footnotes*

## **Changing default titles and**

you find yourself changing titles a lot, you may want to change the default titles. You can do this using the Options window. To open the Options window (not shown), click **File** ► **Options** from the menu bar. Then click **General** from the selection pane on the left. On the General page you can specify new titles that will replace the default titles for all tasks. You can choose to keep the footnote to blank, or specify new footnotes to replace the default footnote.

By default, a few tasks include the procedure as a title in the results. For example, the Summary Statistics task uses the title "Summary Statistics Procedure." You can turn off these titles by clicking **File** ► **Options** from the menu bar. In the section labeled **procedure settings**, uncheck **Includ procedure titles in results**.



 3.5

## Applying Standard Formats

Every time you run a task that prints data, the data should be displayed. That's good, but what if the data may not be exactly what you expect? For example, if you print a Data Grid or query, the dates will be displayed in the standard SAS date format. If you want the format to be saved with the data, you can apply a standard format to the variable.

|   | Volcano       | StartDate  | EndDate    |
|---|---------------|------------|------------|
| 1 | Barren Island | 12/20/1795 | 12/21/1795 |
| 2 | Barren Island | 12/20/1994 | 06/05/1995 |
| 3 | Erebus        | 12/12/1912 |            |
| 4 | Erebus        | 01/03/1972 |            |
| 5 | Etna          | 02/06/1610 | 08/15/1610 |
| 6 | Etna          | 06/04/1787 | 08/11/1787 |
| 7 | Etna          | 01/30/1865 | 06/28/1865 |

**Opening the Properties window** To change the format of a variable, open the Properties window (right-click the variable name in the Data Grid or query and select **Properties**). In the Properties window, click the **Formats** tab. Under **Standard formats**, select the format you want to apply to the variable. In this example, the Volcano, StartDate, and VEI have been selected for StartDate.

## List Data for C:\FAI

Data  
Options  
Titles  
Properties

### Data

Data source: C:\FAI Tou  
Task filter: None

### Variables to assign:

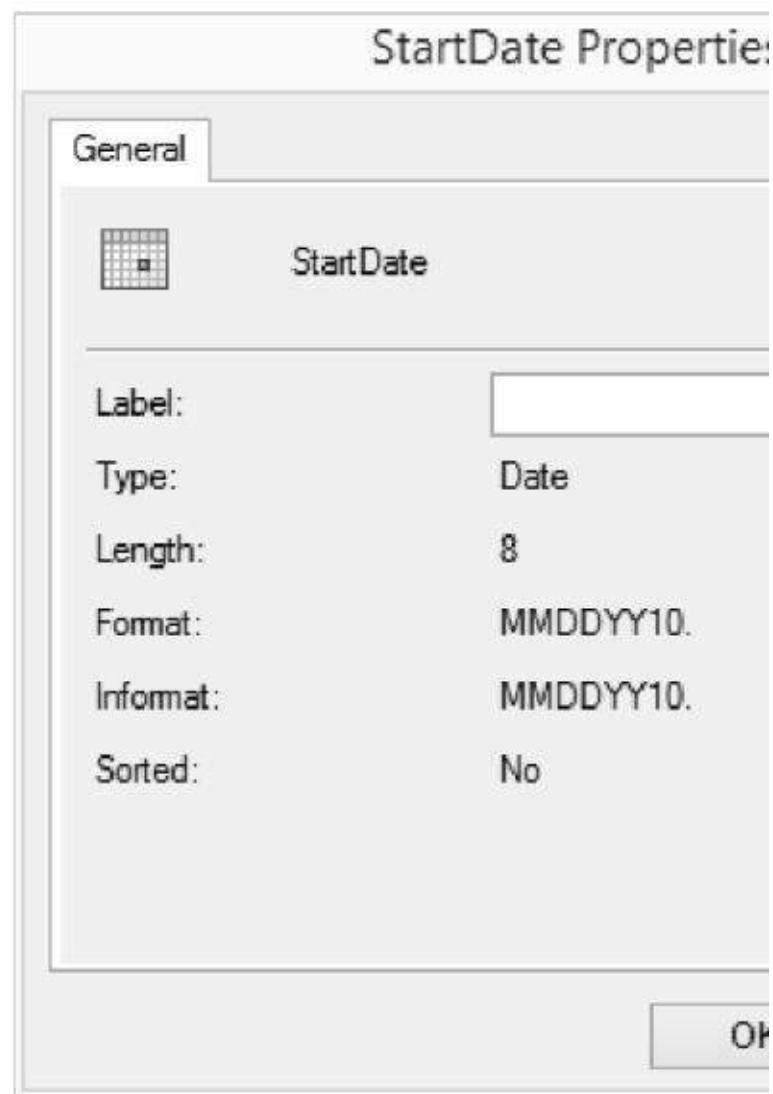
#### Name

- Volcano
- StartDate
- EndDate
- VEI

Prints the variables specified to this role.

 Preview code





**Selecting formats** In the Form window, choose the category of fo you want to see, and then click the

the format you want to use. In the labeled **Attributes**, specify the overall width (the longest number of characters) and the number of digits that will be allowed for this variable. For numeric variables, you may also specify the number of decimal places. The area labeled **Example** shows a sample of how this format will look. See section for a list of commonly used standard formats. In this Formats window, the category Date has been selected, a width of 17, and no decimal places (WEEKDATE17.0).

When you are satisfied with the format, click **OK**. Then click **OK** in the Properties window, and click **Run** in the task window.

**Results** Here is the beginning of a report using the new format for the StartDate. Any formats you apply to a task are not saved in the original dataset and will not be used in other tasks.

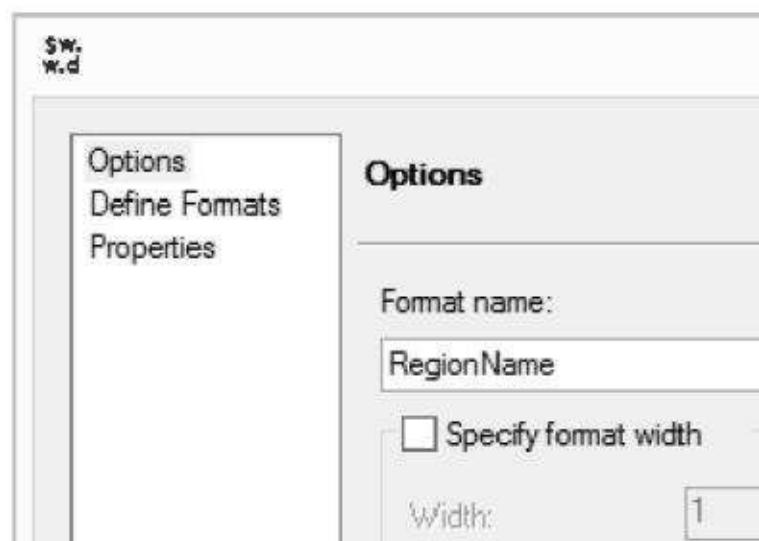


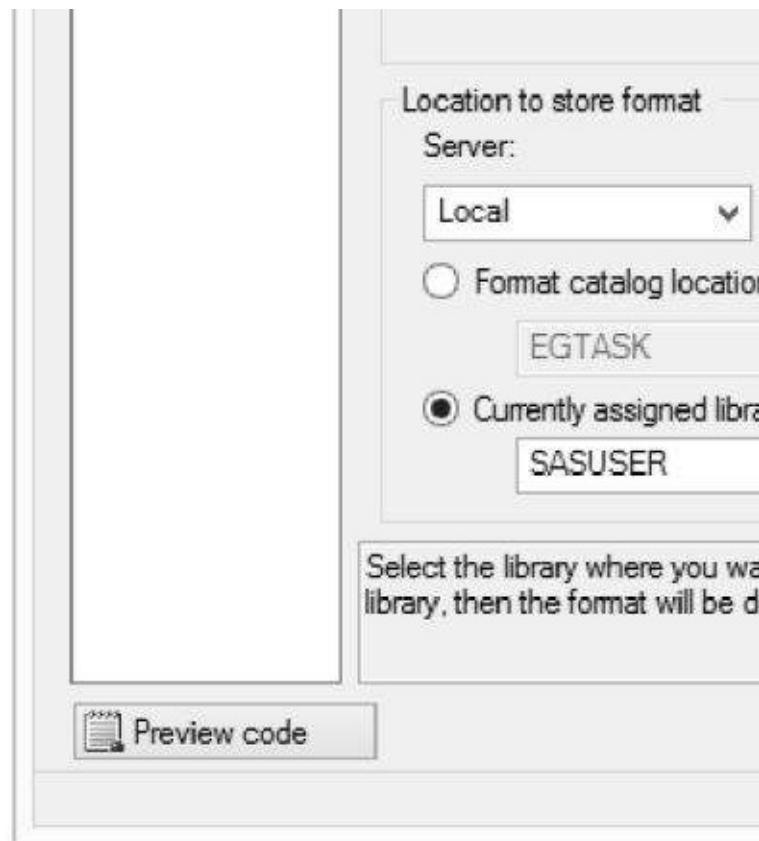
### 3.6

## Defining Your Own C

Even with all the standard formats, you might need something different. In those cases, defined formats allow you to specify ranges of values in your data. To create a new format, choose **Data ▶ Create Format** from the menu bar or click the **Create Format** button on the Options page.

**Options page** To create a format, click the **Create Format** button on the Options page. Then type a name for the new format. The name can be up to eight characters or fewer in length; can't begin with a numeral, or underscores. This example shows the creation of a format named **RegionName**.





Any formats stored in the WORK library will be available in the Enterprise Guide. To save your formats in a permanent library, such as the SASUSER library, make sure to save your format on the same library as the format in the WORK library, you can do this by clicking the 'Save' button in the task. When you are satisfied, click the 'OK' button.

**Define Formats page** Define formats by clicking the 'Define' button. You can enter a name and type a label in the **Label** box. You can also choose a format for that label. Repeat these steps until you have defined all the formats you need. Note that labels are case-sensitive, so "yes" is not the same as "YES". For example, if you define a format for the label Africa and then apply it to the variable continent, the value Africa will be displayed as "AFRICA".



If you want to specify a range of data values (such as A-D) rather than a discrete value, click the down-arrow under **Type** and select **Range** from the pull-down list. When you do that, a second box will appear under **Values** so that you can type in the two end points for your range

**Define Form**

---

Format definition

|        |
|--------|
| Label  |
| Africa |

---

Range definition

|          |
|----------|
| Type     |
| Discrete |

You can specify a label to be used for missing values or for all other values by clicking the down-

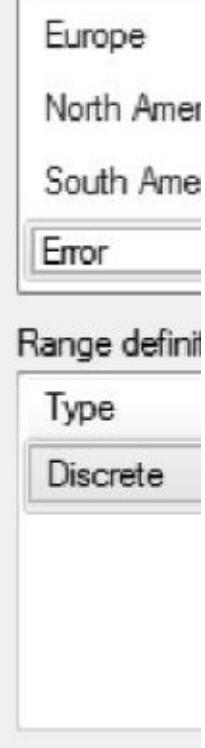
**Define Form**

---

Format definition

|       |
|-------|
| Label |
|-------|

arrow in the box labeled **Values**. In this example, you can see that the label Error will be applied to all other data values. When you are satisfied with the format labels and ranges, click **Run** to create the format.



All character format names begin with a dollar sign, an format. A more detailed example of

**Using user-defined formats** same ways you apply standard for \$RegionName. format being used



### 3.7

## Defining Your Own N

The previous section showed how Creating a user-defined format for options. Start by selecting **Tasks ► Format** window. The Create Form

### Options page

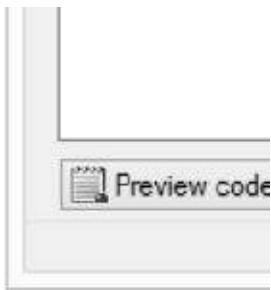
Select a **Format type of Numeric.**

Then type a name for the new format in the **Format name** box. This name must be 32

characters or fewer in length; cannot start or end with a numeral; and can contain only letters, numerals, or underscores. This



example shows a numeric format named HeightGroup.



Any formats stored in the WORK library (the default) for your format, choose a different library for your format on the same server with the WORK library, you can always redefine formats until you are satisfied, click **Define formats**.

## Define Formats

**page** Defining a format is a two-step process. First, click **New** next to Label and type a label in the **Label** box. Then in the **Values** box, type the data values corresponding to that label. Repeat these steps for the second label, and so on, until you have created all the labels that you want.





When you specify the data values, you have some choices. Under **Type**, click the down-arrow to open the pull-down list and select either **Discrete** (if you have a single value) or **Range**.

You can make ranges inclusive or exclusive. In this example, the label Middling maps to values from 500 up to (but excluding) 4000. If you see a red box over ranges at the top of the window, it means that your ranges are overlapping and you will probably want to

Define Fo

Format def

Label

Pipsquea

Middling

Range def

Type

Range

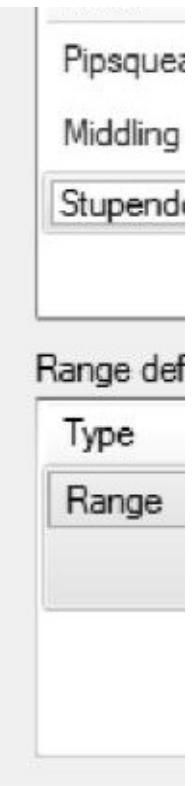
Define Fo

Format def

Label

make one of them exclusive.

You can specify a label to be used for special values by clicking the down-arrows in the boxes below **Values**. For discrete values, you can select **All Other Values** or **Missing Values**. For ranges, you can select **Low** (the lowest possible value) or **High** (the highest possible value). If you have already mapped labels to ranges, click **Run** to create the new format.



Unlike character formats, numeric formats end with a period, so HeightGroup.

**Using user-defined formats**

The same ways you apply standard formats to cells shows the HeightGroup. format be



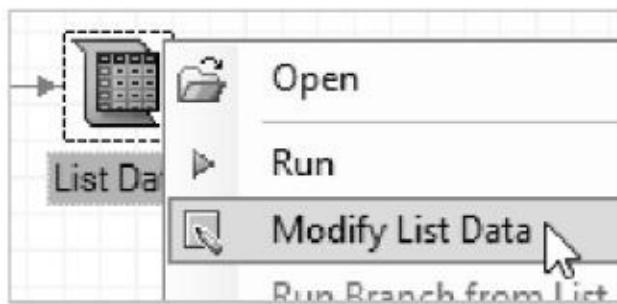
### 3.8

## Applying User-Defined Formats

You can apply user-defined formats to a Data Grid, a task, or a query. The variables \$RegionName, and HeightGroup.

Here is a simple report from a List Data task using the Volcanoes data set. The variables Region, and Height have been assigned the List variables role. Notice that they are unformatted.

You can apply a format when you



**Opening the Properties window** allows you to change the format for a variable you want to change in the **roles** area), and select **Properties** f

selected for the variable Region.

List Data for C:\FAI Tours\Volcanoes

Data Options Titles Properties

Data

Data source: C:\FAI Tours\Volcanoes  
Task filter: None

Variables to assign:

| Name     | Assign to  |
|----------|------------|
| Volcano  | Sort Colu  |
| Country  | Show Nat   |
| Region   | Show Lab   |
| Height   | Properties |
| Activity |            |
| Type     |            |

Preview code

List of variables that you can assign to:

- Volcano
- Country
- Region
- Height
- Activity
- Type



In the Properties window, click **Clip** to open the Formats window for that

Then in the Formats window, select the **Category** **User Defined**. All the formats you have created will be listed. The example shows the Formats window

the variable Region. Because Region is a character, only character formats are applicable. In this case, \$REGIONNAME. is bolded and selected.

Once you have selected the correct format, click **OK** in the Formats window and then click **OK** in the Properties window.

After you have applied all the formats that you want, click **Run** in the task window.

**Results** In the new report, you can see that the values of Region are displayed using the \$RegionName. format that was created in section 3.6. In addition, the values of Height are displayed using the \$Height. format.

In this example, the user-defined formats were applied to listed variables. The result was that the formats simply replaced one value with another. However, if you apply a user-defined format to a variable assigned to a task role that groups data, then it changes the structure of the report. See the next section for an example of creating such a report.



 3.9

## Grouping Data in Rep

Often you want to summarize your data by age group. If you might want separate summary variables for each age group, then you can create a new variable for age group, you can use the Recode task to recode your data, but both of these methods require that you have a variable for age group. If you want to add a new variable, then you can use the One-Way Frequencies task.

This example groups the Height variable by Age Group. You can use the One-Way Frequencies task to create a new variable for age group or to recode your data. You can also use the One-Way Frequencies task to add a new variable to your data set.

Here is a sample of the Volcanoes data set. To open the task, click the data icon in the Project Tree or Process Flow and select **Tasks ▶ Describe ▶ One-Way Frequencies** from the menu bar. The One-Way Frequencies window will open, displaying the Data page.

|   |
|---|
| 1 |
| 2 |
| 3 |
| 4 |
| 5 |

**Opening the Properties window** To apply a format in a task, right-click the name of the variable to be grouped in the Data page (in either the **Variables to assign** area or the **Task roles** area), and select **Properties** from the pop-up menu. In this example, **Properties** is being selected for the variable Height.





## Height Properties

|                                                                                   |                      |
|-----------------------------------------------------------------------------------|----------------------|
| General                                                                           |                      |
|  | Height               |
| Label:                                                                            | <input type="text"/> |
| Type:                                                                             | Numeric              |
| Length:                                                                           | 8                    |
| Format:                                                                           |                      |
| Informat:                                                                         |                      |
| Sorted:                                                                           | No                   |
| <input type="button" value="OK"/>                                                 |                      |

Then in the Formats window, select the User Defined category. Since this example uses a date format, the category **User Defined** is selected.

has been selected. All the formats in this category will be listed. Here is the window for the variable Height. Because Height is numeric, only numeric formats are listed. In this example, HEIGHTGROUP. is being selected.

Once you have selected the correct format, click **OK** in the Formats window and **OK** in the Properties window. Then click the **Run** button in the task window.

| One-Way Frequency Results |           |         |
|---------------------------|-----------|---------|
| The FREQ Procedure        |           |         |
| Height                    | Frequency | Percent |
| Pipsqueak                 | 3         | 9.3     |
| Middling                  | 20        | 62.5    |
| Stupendous                | 9         | 28.1    |

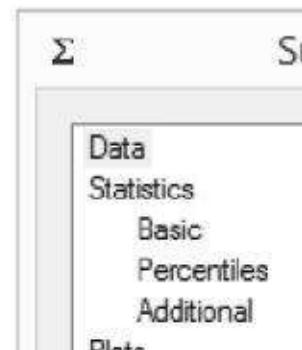


### 3.10 Creating Summary Data

Sometimes you may want to save a data set and join it with other data. Many tasks in SAS Enterprise Guide have a Summary Statistics task, such as the Table Analysis, Summary Tables, and Descriptive Statistics task, but the basic steps are the same.

Here is a sample of the Volcanoes data set. To open the task, click the data icon in the Project Tree or Process Flow and select **Tasks ► Describe ► Summary Statistics** from the menu bar. The Summary Statistics window will open, displaying the

**Data page** For the Summary Statistics task, you must assign at least one variable to the **Analysis**

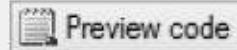


- 1
- 2
- 3
- 4
- 5
- 6

variables role,  
and all analysis  
variables must be  
numeric.

Classification  
variables, on the  
other hand, are  
optional and may  
be numeric or  
character.

If you assign a  
variable to the  
**Classification**  
**variables** role,  
then SAS  
Enterprise Guide  
will produce separate summary st  
When you drag a variable to the cl  
choose the sort order (Ascending c  
default is to exclude any observati  
example, the variable Height has k  
classification variable.





## **Results page**

Click **Results** in the left pane of the Results page, you will see options that affect the output.

To save an output data set, check the **Save statistics to data set** option. SAS Enterprise Guide gives the data set a name beginning with MEAN and stores it in a default location. To specify a different name or location, click **Browse**. This opens the Save As window (not shown). Choose a library and a name for your file. When you are satisfied, click **Save** to return to the Results page. In the Results page, you will see the new data set name.



Before you run the report, you may want to change the output data set, you may not care about the report, uncheck the **Show statistics** checkbox.

You can also select the **Combinations** button. The **All ways** (the default) gives you summary data for all categories. The **All ways** gives you summary data for all categories, including the grand total. If you choose **Specified**, you can specify which categories to include. In this example, **All ways** is being selected.

**Results** Here is the output data set. Notice that the output data set contains statistics for the grand total, while the data itself is grouped by Activity. Notice that SAS Enterprise Guide has created three automatic variables. \_FREQ\_ is a numeric variable, while \_WAY\_ and \_TYPE\_ reflect the grouping variable. Notice that \_WAY\_ is a numeric variable.

| Activity  | _WAY_ | _TYPE_ | _FF |
|-----------|-------|--------|-----|
| 1         | 0     | 0      |     |
| 2 Active  | 1     | 1      |     |
| 3 Extinct | 1     | 1      |     |

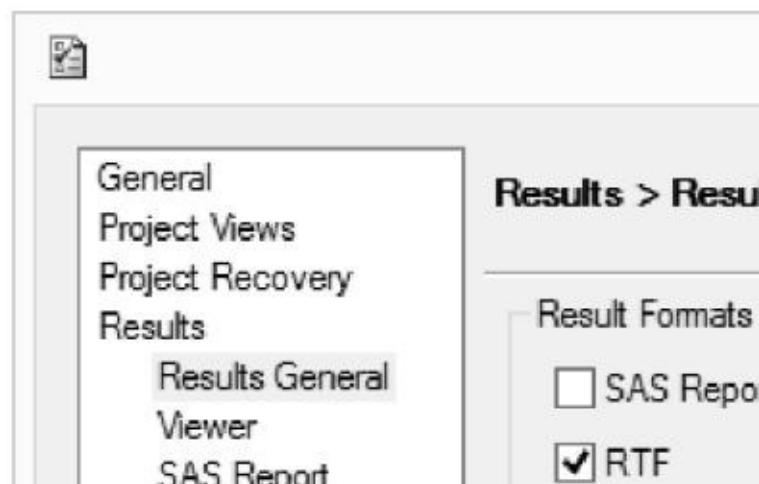


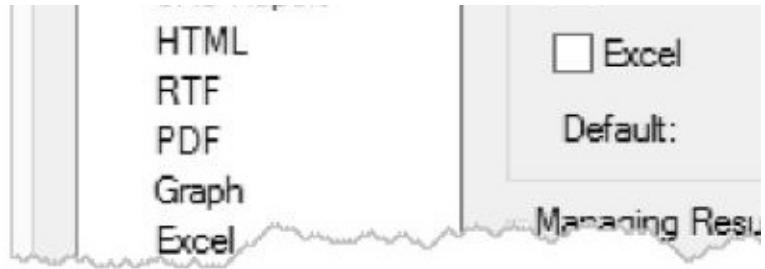
### 3.11 Changing the Result F

When you run a task that produce Report. With SAS Report format, y reports into a single report. SAS E Excel, PowerPoint, and plain text.

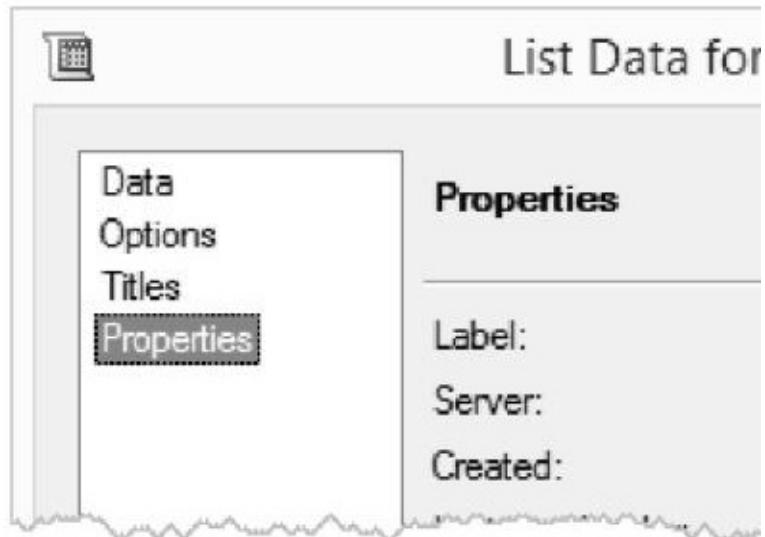
#### Setting the default result fo

Options from the menu bar. The C selection pane on the left to open t under the heading **Result Formats** the format names. When you are s subsequent results. In this exempl run will produce results in both fo





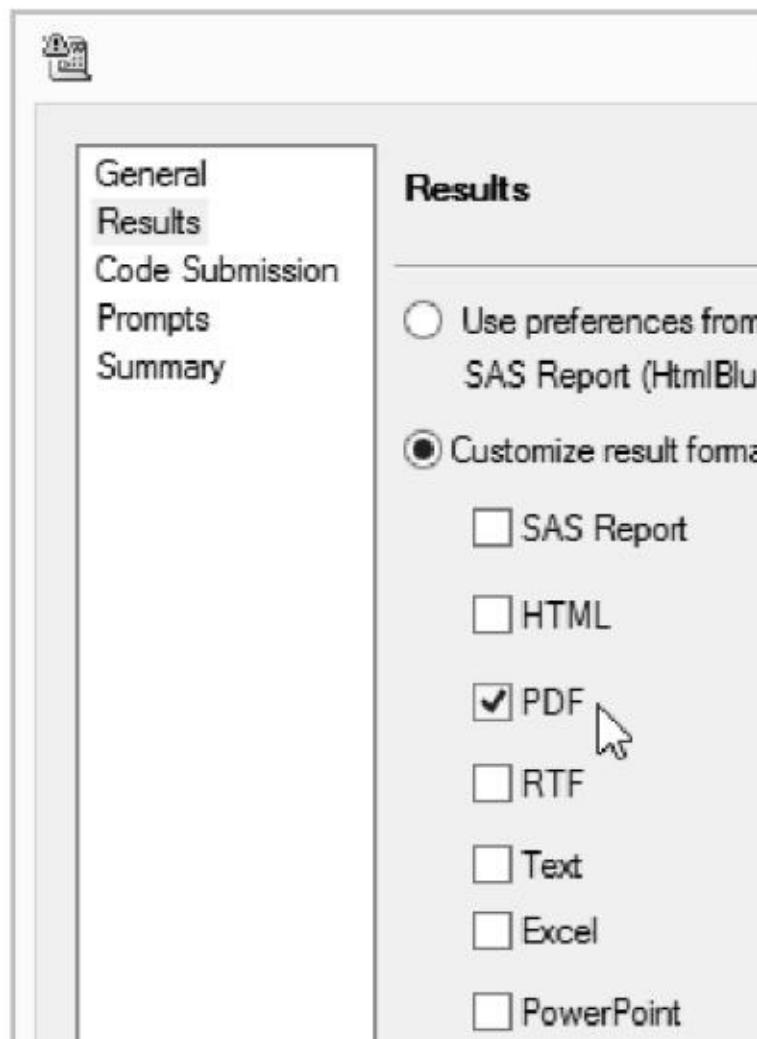
**Changing the result format**  
format for an individual task, then left, and click the **Edit** button. This will open the Properties window from



You can also open the Properties window by right-clicking in the Project Tree and selecting **Properties**.



In the Properties window, click Results and then select **Customize result formats**. You can choose the formats and styles for the task's results. Select PDF format. When you are satisfied with your choice, click OK. Then rerun your task to see the results.



Graph Format:

Automatically op

Generates results in PDF

## Moderate and Challenging T

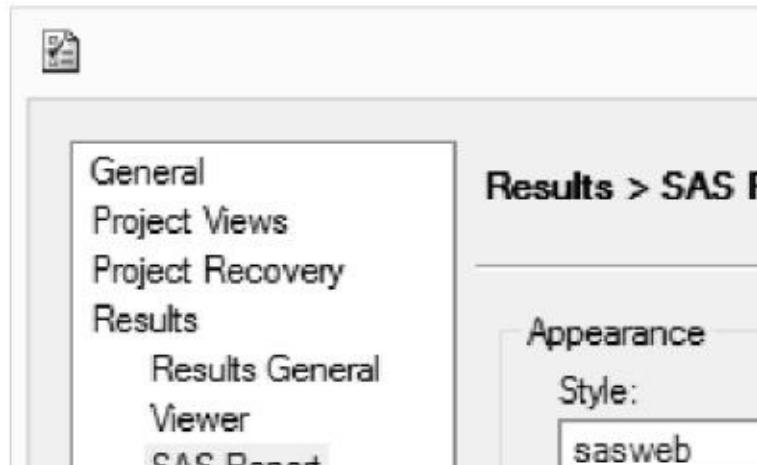
| Volcano     | Departs | Days | Price   |
|-------------|---------|------|---------|
| Etna        | Catania | 7    | \$1,610 |
| Fuji        | Tokyo   | 2    | \$335   |
| Kenya       | Nairobi | 6    | \$1,245 |
| Kilimanjaro | Nairobi | 9    | \$1,965 |
| Reventador  | Quito   | 4    | \$875   |

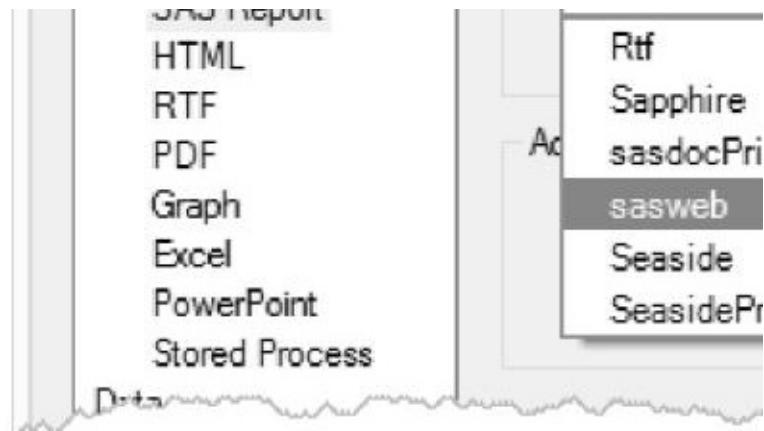


## 3.12 Changing the Result S

The style determines the overall look of results. All results are defined in the style. There are other result formats – HTML, RTF and PDF – from a number of built-in styles.

**Setting the default result style**  
In the Options window. Open the Options window. Click the type of output (SAS Report) on the left to open the page for that result format from the Style dropdown. Use the style you select for that result format. SAS Report format.





**Results** Here is the result of a List Data task in SAS Report format using the Sasweb style.



## **Changing the result style**

To change the results of an individual task, right-click the task, and click the **Edit** button. Then open the Properties window by right-clicking the task and selecting **Properties** from the pop-up menu.

In the Properties window, click

**Results** in the selection pane on the left to open the Results page. Check the box next to

**Customize result formats, styles, and behavior,** and then select the result format and a style from the drop-down list for each



format. When you are satisfied with your settings, click **OK** to close the Properties window. Then rerun your task to see the results. In this example, the sasweb style is being selected for SAS Report format.

## **Changing the result style after running a task**

For results in SAS Report and HTML formats, you can also change the style after you run the task. Click the **Properties** button on the workspace toolbar for the result to open the Properties window (not shown). Then your result will be displayed in the style you selected.

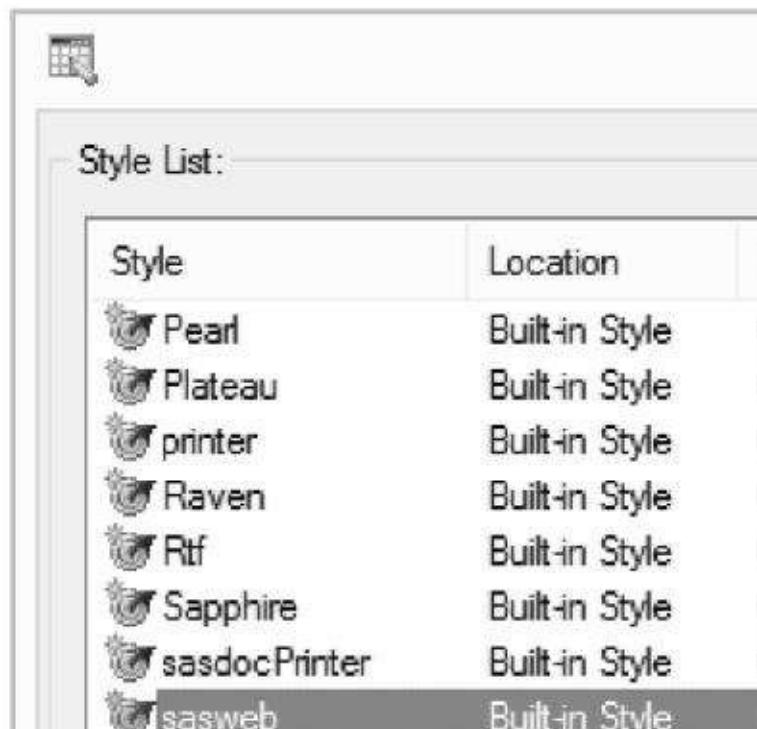




### 3.13 Customizing Styles Using Style Manager

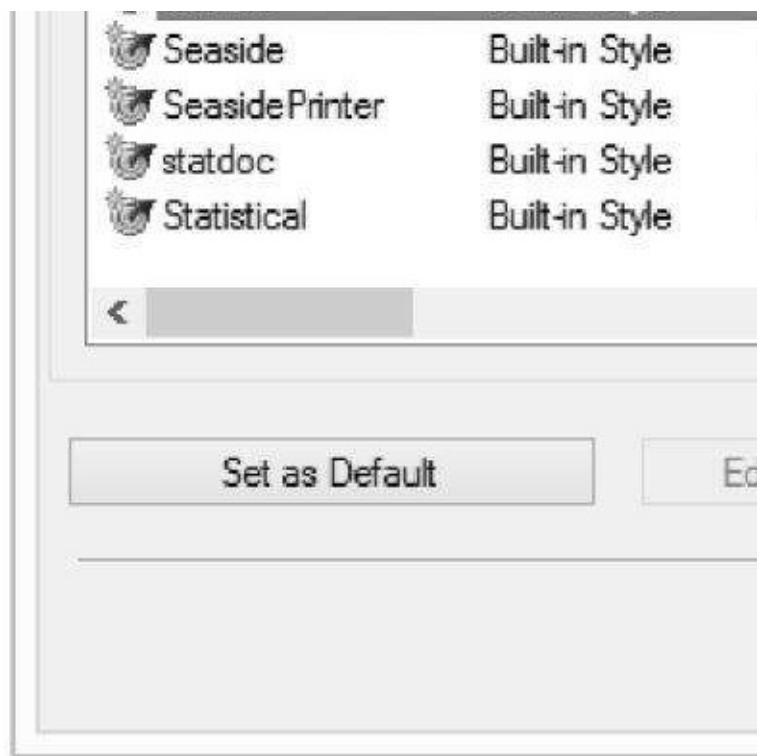
Although SAS Enterprise Guide comes with styles, you can change them something a little different. The Style Manager allows you to change the style for Report and HTML results. You can change the font, colors, line thickness, result formats, and the text format.

**Opening the Style Manager**  
To open the Style Manager, click **Tools > Style Manager** from the menu bar. The Style Manager window appears, as shown in Figure 3.13. On the left, a tree view shows the categories of styles. On the right, the **Style List** displays the styles and their locations.



The screenshot shows the SAS Enterprise Guide Style Manager window. The title bar says "Style Manager". The left pane has a tree view with categories like "Report", "HTML", and "Printer". The right pane is titled "Style List:" and contains a table with two columns: "Style" and "Location". The table lists eight styles, all categorized as "Built-in Style": Pearl, Plateau, printer, Raven, Rtf, Sapphire, sasdocPrinter, and sasweb. The row for "sasweb" is highlighted with a dark gray background.

| Style         | Location       |
|---------------|----------------|
| Pearl         | Built-in Style |
| Plateau       | Built-in Style |
| printer       | Built-in Style |
| Raven         | Built-in Style |
| Rtf           | Built-in Style |
| Sapphire      | Built-in Style |
| sasdocPrinter | Built-in Style |
| sasweb        | Built-in Style |



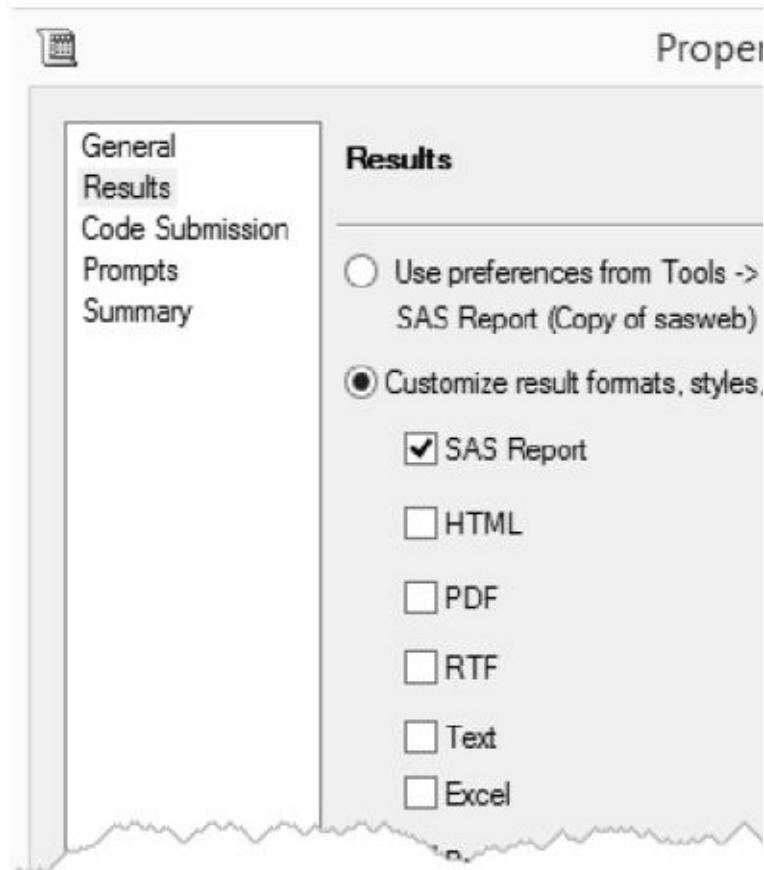
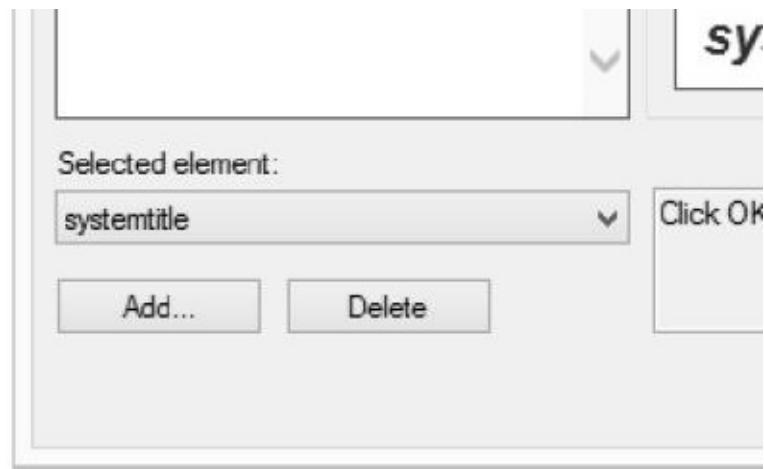
**Editing an existing style** You can edit an existing style by selecting it in the list and clicking the **Edit** button. This opens the Save Style dialog where you can change the style name and choose a storage location. The new style will then appear in the Style Manager.

In the Style Editor window, the properties for the selected element are displayed. You can click on the element in the preview area or in the list on the left, or select its name from the list and click the **Set for Element** button. You can then choose the text style for that element in the area on the right. For example, if you give a text style of **Bold Italic**, all text in that element will be displayed in bold italic.



In addition to changing the style of your style, you can add images to your style using the **Image** button in the toolbar. To add an image, click the **Image** button, select the image you want to add, and then click **OK** in the **Image** dialog box.

The screenshot shows the SAS Style Editor interface. On the left, there is a preview window titled "Click to select an element:" containing the text "SAS System Title" in bold, followed by "SAS Procedure Title". Below this is a table with three columns labeled "Column 1", "Column 2", and "Column 3". The first row contains "Row 1" and "Data (Num)" and "Data (Char)". The second row contains "Row 2" and "Data (Num)" and "Data (Char)". To the right of the preview window is a vertical panel titled "Attributes" which lists various styling options: "Text" (selected), "Select", "arial,helvetica", "Text size" (14pt), "Text color" (black), "Horizontal alignment" (Default), "Vertical alignment" (Default), and "Preview". At the bottom of the preview window, there is a button labeled "GRAPH RESULTS".



for details about changing the styl



## 3.14 Exporting Results

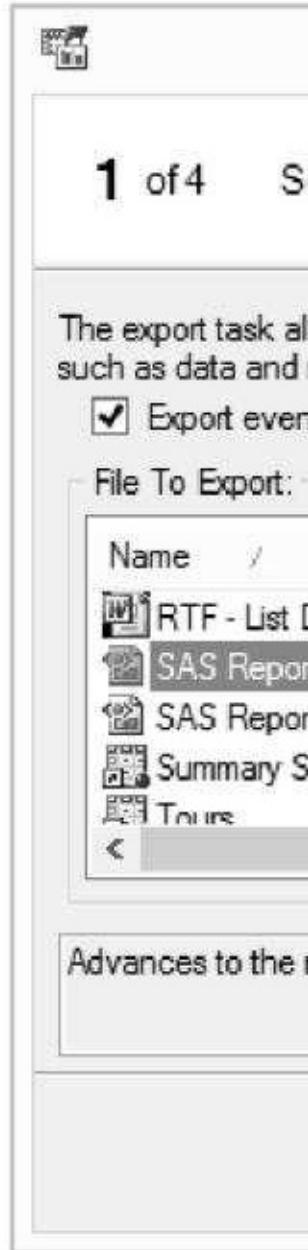
By default, results generated by SAS Enterprise Guide do it automatically each time you want, you can export results to a file.

To export results, click **Export** on the workspace toolbar above the results and select **Export result-format - result-name** or **Export result-format - result-name As A Step In Project**. You can access the same options by right-clicking the results icon in the Project Tree or Process Flow.

**Exporting** If you select **Export result-format - result-name**, then a Save window will open (not shown). Navigate to the location where

you want to save the new file, specify the name, choose a location to save it, and click **Save**. If your results are displayed in a window, you can click **File**, **Save As** to save the file in SAS Report, HTML, XML, or PDF format. You can also click **File**, **Print** to print the current Process Flow; and if you run your process, the results will be printed.

**Exporting as a step in a project** If you select **Export As A Step In Project**, the Export wizard will open. In the first window, all items in the project are listed with the selected item highlighted. Click **Next**.



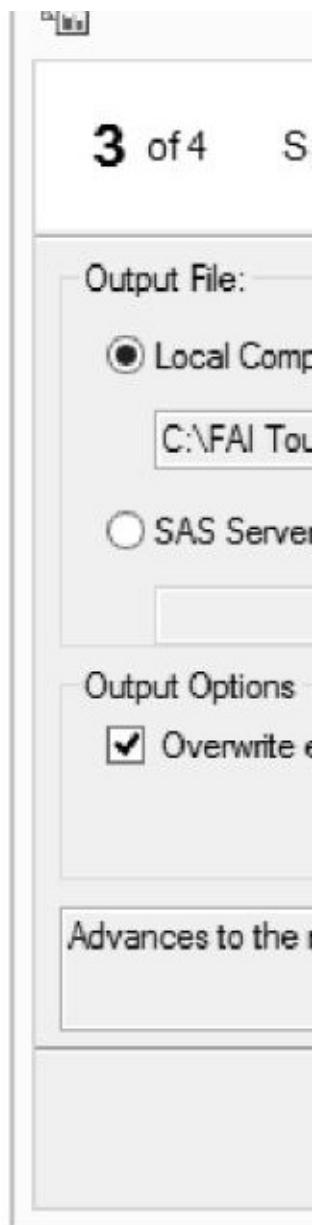


If the result that you want to export is in SAS Report format, then the second window will give you a choice for the output file type: SAS Report, HTML, or PDF. If the result format is not SAS Report, then you will not have a choice because you can only export the result in its original format, and you will not see this window. Choose the desired



output file type  
and click **Next**.

In the next  
window choose  
either **Local  
Computer** or  
**SAS Servers**, and  
then click the  
**Browse** button to  
navigate to the  
location where  
you want the file  
to be saved. In  
this window, you  
can also choose  
whether to  
**Overwrite  
existing output.**  
Click **Next** to  
view a summary  
of your choices in the final window



When you export as a step in a project, along with an icon for the results will be automatically re-ex





4

“ Every  
man’s mir  
a new idea  
never shri  
former dir

From *The Autocrat of the Breakfast-Table*





# CHAPTER 4

## Producing C Summary Ta

- 4.1 Creating Summary
- 4.2 Adding Statistics t
- 4.3 Changing Headings
- 4.4 Changing Class Le
- 4.5 Changing Table Pi
- 4.6 Changing Data Va

... 8 ...



 4.1

## Creating Summary Tables

The Summary Tables task is the most common task in SAS Enterprise Guide. It gives you control over how data are arranged, summarizes data, and provides a wizard that accesses basic features.

This example uses the Volcanoes data set to create a report showing the number of active and extinct volcanoes for each region. To open the task, click the data icon in the Project Tree or Process Flow, and select **Tasks | Summary Tables**. The Summary Tables window will open.

**Assigning task roles** To produce reports, assign variables to the **Classification variables** and **Summary variables**. SAS Enterprise Guide will divide the data into groups based on the classification variables. The following window shows the variable Activity serving as classification variable.



File Edit View Insert Tools Options Help

Data  
Summary Tables  
Results  
Titles  
Properties

**Data**

Data source: C:\FAI Tours\Dat  
Task filter: None

---

Variables to assign:

| Name     |
|----------|
| Volcano  |
| Country  |
| Region   |
| Height   |
| Activity |
| Type     |

[Preview code]

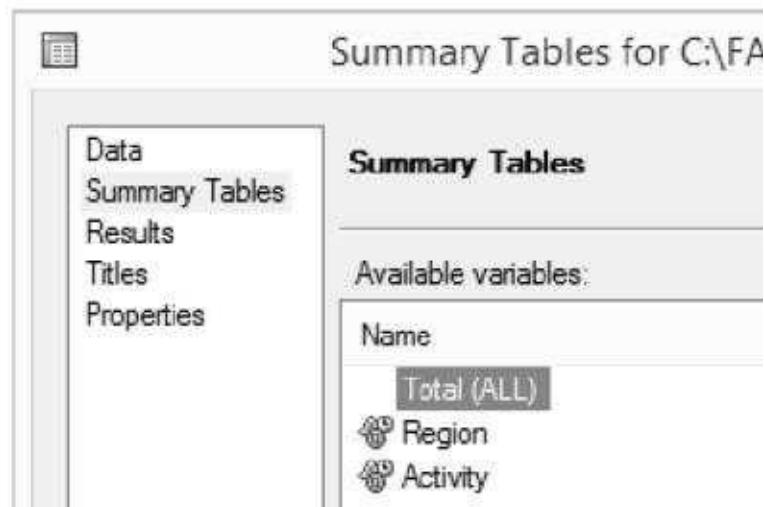
You must add at least one variable to the table definit

When you drag a variable to the clipboard, you can select options for that variable. If the values are included as valid rows in the case, two volcanoes have a missing value. To handle missing values, click **Missing values**.



Once you exclude missing values, they are excluded from the report even if you don't want them. It's a good idea to assign variables to the report before you start creating it.

**Arranging your table** Before you start creating the report, you need to arrange the report table. Start by dragging the table to the left. In the Summary Tables panel, click the **Preview** button. To assign a variable to the report, click the **Available variables** button. From the list of available variables, select the variable you want to use. The trick is to use the allowed symbol,  $\otimes$ , then you can drop the variable onto the report table. Then you can drop the variable onto the report table.



The screenshot shows the SAS/IML Studio interface. On the left, there is a large empty workspace area. To the right of the workspace is a vertical bar containing a table titled "Available statistics:" and a "Preview code" button.

| Name  | Description          |
|-------|----------------------|
| CSS   | Corrected sum o...   |
| CV    | Coefficient of va... |
| Max   | Maximum value        |
| Mean  | Mean (average)       |
| Min   | Minimum value        |
| N     | Number of rows ...   |
| NMiss | Number of rows ...   |

**Preview code**

the **Total(ALL)** variable to the Pre  
this window, the values of the var  
the columns. When you are satisfi

**Results** Here is the report of Ac  
Region. Notice that the value in ea  
simply the number of volcanoes in  
category. N (the number of non-m  
values) is the default statistic for  
classification variables.



## 4.2

## Adding Statistics to Summary Tables

The previous section showed how to add statistics to a report. In this section, you learn how to add statistics to a report with a single click. For example, if you want to add the mean test score for each class. In the Summary Tables window, click the Statistics button to open a list of other statistics, including means, standard deviations, quartiles, standard deviations, and more.

This example uses the Tours data set to demonstrate how to add statistics to a report with a single click. To open the Summary Tables window, click the data icon in the Project Tree or Flow to make it active, and select **Analyze ▶ Describe ▶ Summary Tables** from the menu bar. The Summary Tables window opens, displaying the Data page.

**Assigning task roles** There are several ways to assign task roles to variables. These include N and Pct, which are computed only for analysis variables.

to compute a mean using character variables containing sums and means, assign the variable Days to the variable Price. The Summary Tables window shows the Tours data set and the variables Days and Price selected.

Summary Tables for C:\FAI\Tours\Datasets\Tours

**Data**

Data source: C:\FAI Tours\Datasets\Tours  
Task filter: None

Variables to assign:

| Name       |
|------------|
| Volcano    |
| Departs    |
| Days       |
| Price      |
| Difficulty |

Select a role to view the context help

Preview code

You must add at least one variable to the table definition.



**Arranging your table** You can arrange classification variables. Find the left. In the Summary Tables panel **Preview**. To assign a variable to see from the list of available variables. Difficulty form the rows, and the v

Summary Tables for C:\

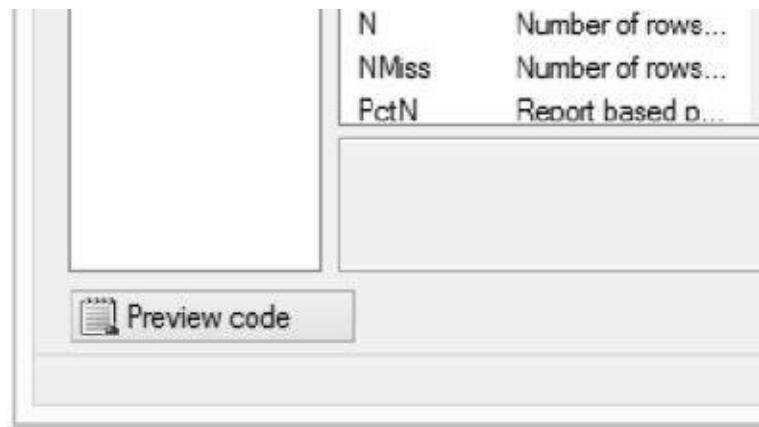
**Summary Tables**

Available variables:

| Name        |
|-------------|
| Total (ALL) |
| Days        |
| Price       |
| Difficulty  |

Available statistics:

| Name        | Description                 |
|-------------|-----------------------------|
| CV          | Coefficient of variation... |
| Max         | Maximum value               |
| <b>Mean</b> | Mean (average)              |
| Min         | Minimum value               |



**Choosing statistics** The default statistics are N, NMiss, and PctN (which counts missing values). The default statistic is N. To choose other statistics, click the 'Available' button in the Statistics dialog box and select the desired statistics from the list. You can also drag and drop statistics from the list into the 'Selected' list. If you want to move a statistic from the 'Selected' list back to the 'Available' list, simply click it with the mouse and drag it back.

In the preceding window, the statistics N, NMiss, and PctN have been placed under the variable Days. Notice that the statistic N has been placed under the variable Days. If you are satisfied with the arrangement of the statistics, click 'OK'.

**Results** Here is the report of Descriptives for the variable Days. Notice that the values in the cells are the minimum, maximum, and mean values, and the maximum number of Days, and the standard deviation.



### 4.3

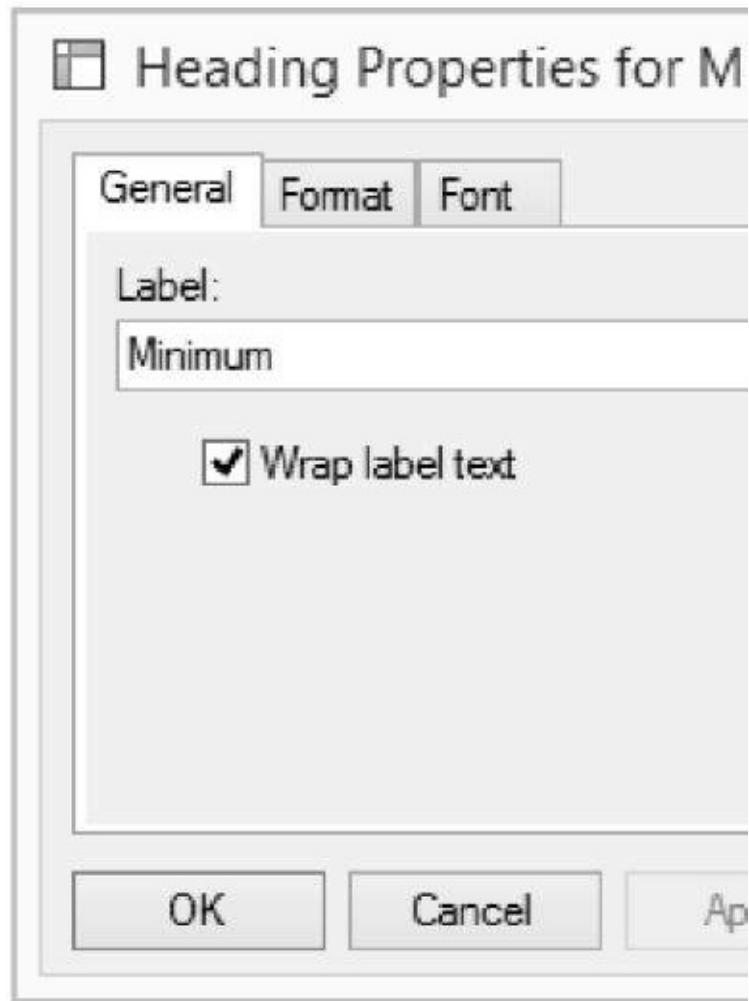
## Changing Heading Pr

Once you've constructed a summary table or report containing statistics, you may want to change the heading for one of the variables. In the Summary Tables window, you can change the heading for a variable by selecting it and then changing its properties.

To modify an existing report, right-click the report icon in the Project Tree and select **Modify Summary Tables** from the context menu. The Summary Tables window will open. In the Preview area, click the **Summary** tab and then click the variable whose heading you want to change in the selection pane on the left.

**Heading Properties** To change the headings that are the names of variables or statistics, use the **Heading Properties** window. For example, to change the heading **Mean** to **Minimum**, you would right-click **Mean** in the **Preview** area and select **Heading Properties** from the pop-up menu.

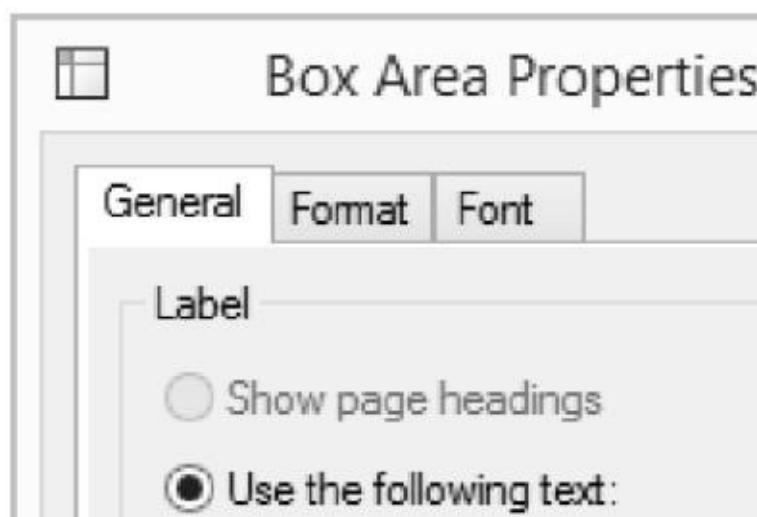
up menu. The Heading Properties window will open.

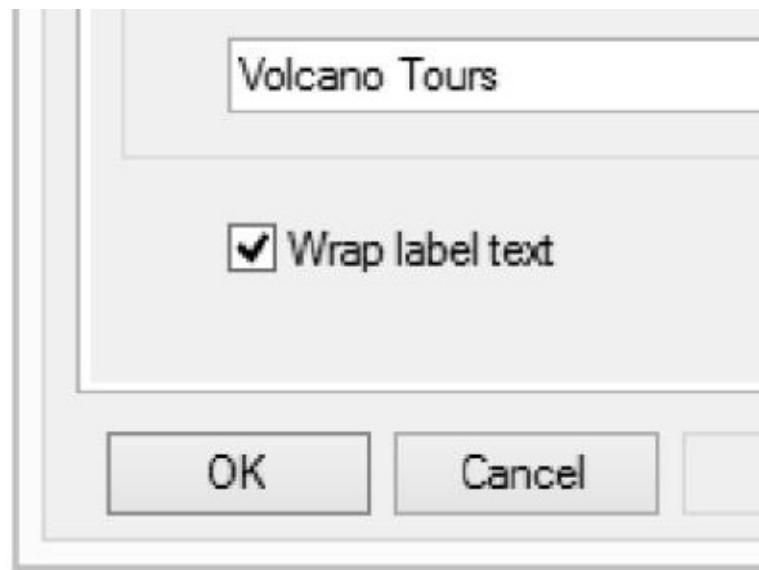




## **Box Area Properties**

Tables reports always contain a box in the upper-left corner. By default this box is empty. But you can put a label in that box to give your report a nicely polished look. To do this, right-click anywhere in the **Preview** area and select **Box Area Properties** from the pop-up menu.





**Results** Here is the report. Notice labels Min and Max have been replaced by Minimum and Maximum, and the Volcano Tours has been inserted in the area.



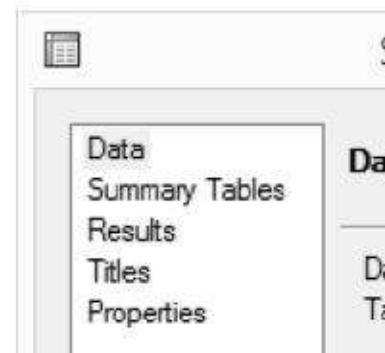
 4.4

## Changing Class Level Tables

The previous section showed how statistics, but data values can also headings. When you change class displayed. To change the way data you use a format.

To modify an existing report, right Tables task icon in the Project Tree select **Modify Summary Tables** fr The Summary Tables window wil

**Applying a format to a clas**  
values, you specify a format in the  
you want to  
change. A box  
will open on  
the right,  
listing options  
for that



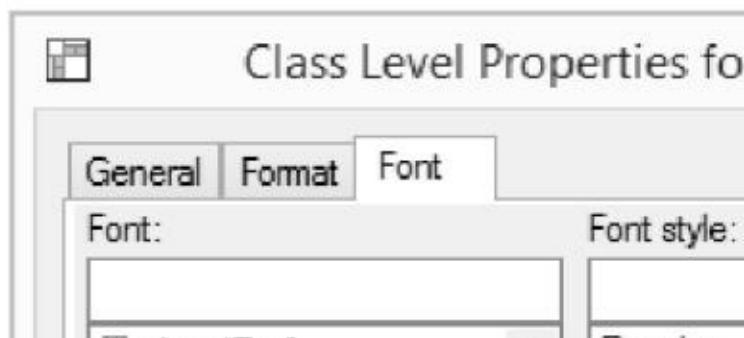
variable. Click the words **Heading format** and the ellipsis button  will appear. Click the button to open a Select Column Format window for the variable. In this example, the heading for the variable Difficulty is being



In the Select Column Format window, choose the category of formats you want to use, then choose the name of the format you want to use. In most cases, to change a heading you will need a user-defined format. In this example, the user-defined format \$DIFF. has been selected. The \$DIFF. format was created in Tutorial B. Sections 1 and 2 also show how to create user-defined formats. Once you are satisfied, click **OK** to return to the Summary Tables window.



**Class Level Properties** To change other properties of class level headings, click the **Summary Tabl** option in the selection pane on the left. Then right-click the name of the classification variable in the **Previe** area and select **Class Level Properties** from the pop-up menu. This example shows Class Level Properties being selected for the variable Difficulty. The Class Leve Properties window will open.





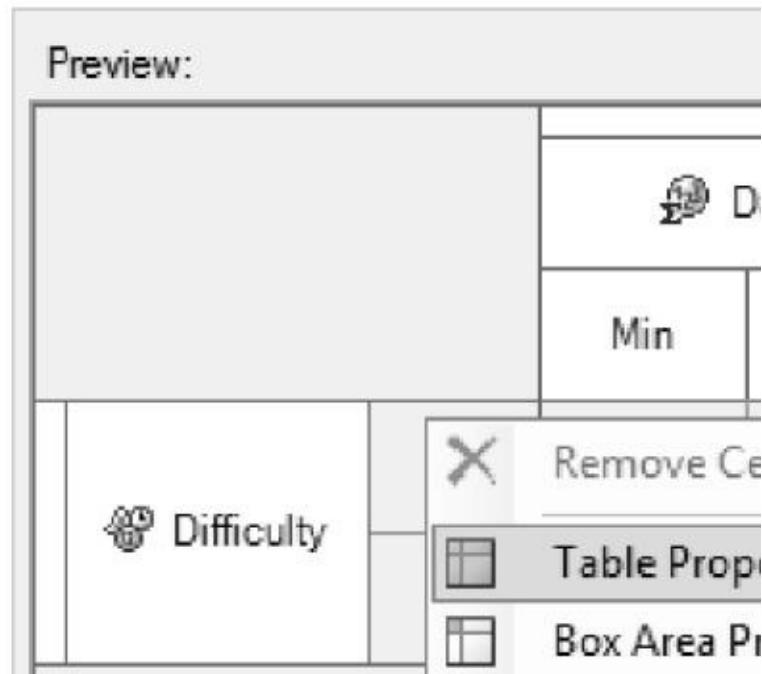
**Results** Here is the report. Notice the labels c, e, and m have been redefined with Challenging, Easy, and Moderate values of the \$DIFF. format), and I have a medium gray background.



## 4.5 Changing Table Properties

In addition to changing headers and footers, you can make a change that will apply to all tables.

To modify an existing report, right-click the Tables task icon in the Project Tree and select **Modify Summary Tables** from the context menu. The Summary Tables window will appear. Select the **Summary Tables** option in the selection bar to display the Preview area.



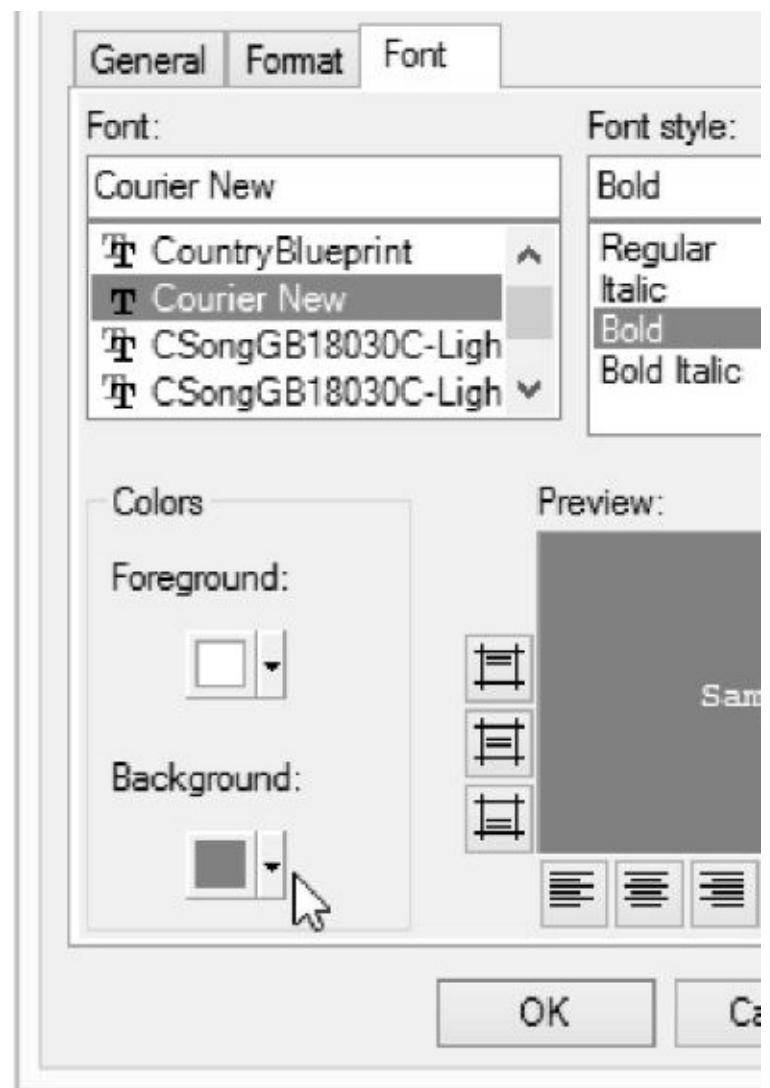


**General tab** Using the **General** tab of the Table Properties window, you can specify options for the treatment of missing values and class variable levels. By default, missing values are displayed as a period (.). You can specify a more meaningful label. In this example, the label none has been assigned to missing values.



**Format tab** Using the **Format** tab in the Table Properties window, you choose a format for the data in the cells of the table. Here, the basic numeric format,  $w.d$ , has been specified with an overall width of 4 characters, and 1 decimal place (4.0).





**Results** Here is the new report. the data cells have a dark gray bac white foreground. Also, the data a in bold Courier New, and with no places.

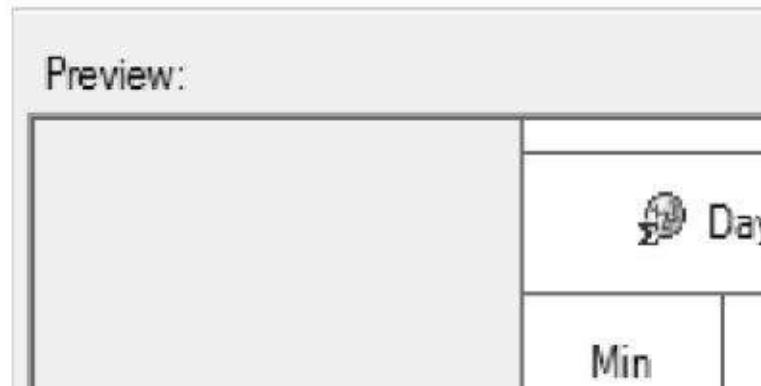


## 4.6 Changing Data Value

Using the Table Properties window sometimes you may want to choose To do that, use the Data Value Pro

To modify an existing report, right-click the table in the Project Tree. Select **Tables** task icon in the Project Tree. Then select **Modify Summary Tables** from the context menu. The Summary Tables window will open. Click the **Summary Tables** option in the selection list to display the Preview area.

To make changes to a particular record, click the **Preview** area and select **Data Value**. The Data Value Properties is being selected.



| Difficulty |  |  |  |
|------------|--|--|--|
|            |  |  |  |
|            |  |  |  |

**Format tab** Using the **Format** tab in the Data Value Properties window, you can choose a format for the data values in the row or column. In this example, the category **Currency** has been selected and SAS Enterprise Guide has listed the available formats for currency. The format **DOLLARw.d** is selected, with an overall width of **9**, which includes the dollar sign, decimal point, and 2 decimal places (DOLLAR9.2).



**Font tab** Using the **Font** tab of the Value Properties window, you can change the font, font style, size, foreground color, background color, and other attributes of the data cells in a row or column. In this example, the font for Price has been set to Courier New, the font style to Bold, the foreground color to white, and the background color to black.

When you are satisfied with the changes, click **OK**. You can now change other properties, or click **Run** to see the results.

## Summary Tab

| Volcano Tours | Days    |         |
|---------------|---------|---------|
|               | Minimum | Maximum |
| Difficulty    |         |         |
| Challenging   |         | 2       |
| Easy          |         | 1       |
| Moderate      |         | 4       |





5

“The people  
the basis of  
progress.”

Attributed to Indira Gandhi (19





# CHAPTER 5

## Modifying I

- 5.1 Creating a Query
- 5.2 Selecting Columns
- 5.3 Creating Columns
- 5.4 Creating Columns
- 5.5 Selected Functions
- 5.6 Adding a Grand T

- 5.7 Adding Subtotals
- 5.8 Creating Summary
- 5.9 Recoding Values i
- 5.10 Changing the Resi



 5.1

## Creating a Query

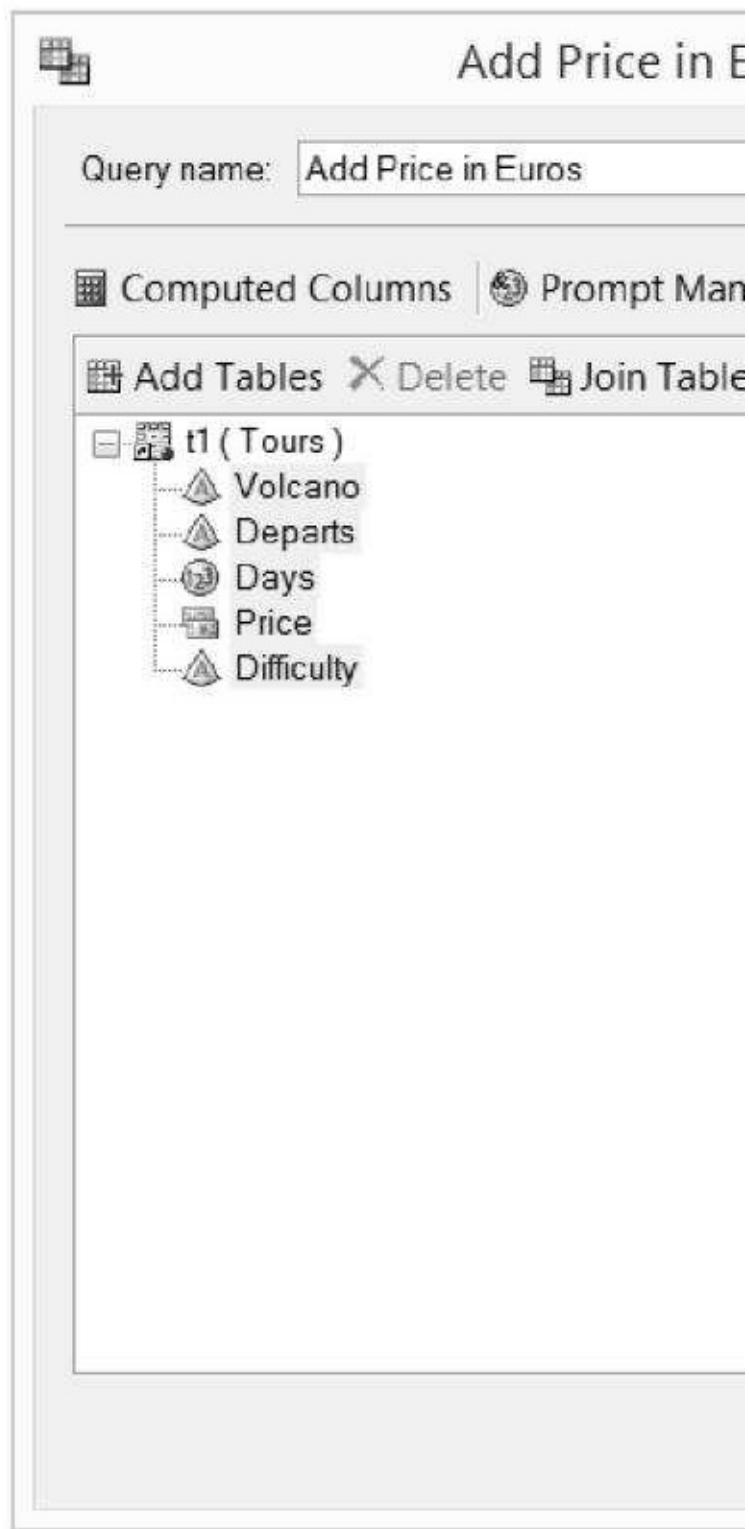
Sometimes the data tables available do not contain all the analyses you need to perform. You may want to add new columns, summarize the data, create new tables, or perform other types of manipulations. The Query Builder is a tool for doing these types of operations. It reads one or more data tables, performs some type of data manipulation on them, and then creates new tables. Tables created by the Query Builder can be saved, or printed. The set of data manipulation operations available in the Query Builder is very powerful.

### Opening the Query Builder

There are several ways to open the Query Builder. One way is to first open the data table that you want to use for your query, then click the **Query** button on the workspace toolbar. Another way is to open the Query Builder by clicking the **Tools** menu, then selecting **Project Tree** or **Process Flow** to make the Project Tree or Process Flow window appear in the menu bar. Alternatively, you can click the **File** menu, then select **New**, and select **Query Builder** from the list.

When you open the Query Builder, there are several tabs at the top of the window. The tabs are: **Query**, **Tables**, **Variables**, **SQL**, and **Script**. The **Query** tab is selected by default. The **Query** tab contains several sections: **Task List**, **Table List**, **Variable List**, **SQL Editor**, and **Script Editor**.

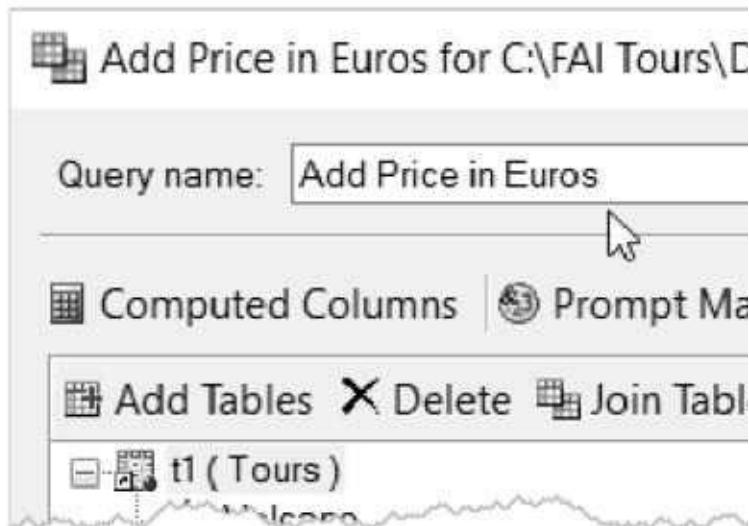
table appears in the list on the left, opens with the Select Data tab on top.





## Giving the query a name

label the query icon in the Process



## Changing the output table

a default location (the EGTASK lib given a name starting with the wo name, click the **Change** button located next to the Output name. This opens a Save File window where you can navigate to the desired storage location and give the table an appropriate name. In this example

the data table will be stored in the SASUSER library and will have the name ToursEuros.

**Results** The result of a query can be a data table or a data view. Data views do not contain data. Instead they point to another data table. Data tables and data views are used to store data in a project. Reports are for viewing data. The type of query result is discussed in the next section.

In order to run the query, you must save it (see the “Save” button in the next section), and you will probably want to add it to your project. You can add the desired selections in the Query Builder and then click the “Add” button to add the query to your project.

Here is what the Process Flow looks like after running the Query Builder. In this example, the Tours data table is the input to a query named “Add Price in Euros” and the resulting data table is named ToursEuros.



 5.2

## Selecting Columns in

To run a query, you must tell SAS select columns on the **Select Data** columns.

Open the Query Builder by clicking active, and selecting **Tasks ▶ Data** Volcanoes data table used in this example.

**Selecting the data** When you open the Query Builder window, the **Select Data** tab is on top, and no columns are selected. To select a column for the query, click the column name in the box on the left and drag the column and choose **Select Col** a time, hold down the control (CT) key while you click the column names. You can also click the table name and dragging it to the query builder. The Country, Region, and Height have

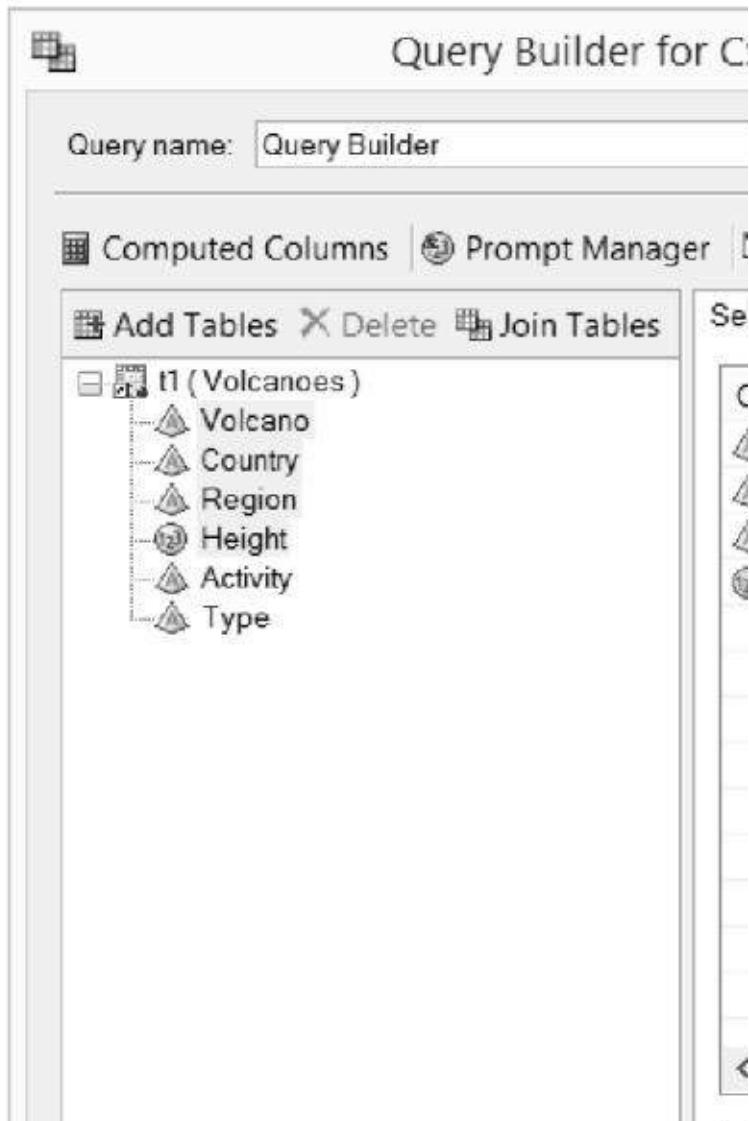


If you want to remove a column from the **Data** tab and click the delete button. You can change the order of the columns using the



## Setting properties for columns

clicking the column name on the **Selected Columns** list on the right side of the window.





This opens the Properties window for the column. If you want the column name for the output data table to be different than the input data table, then enter the new name in the Column Name field. To change the format associated with the column, click the **Change** button to open the Formats window (not shown). You can also specify a label and length for the column. Here, the Height column is renamed Meters and given the label Height in Meters. Click **OK** to return to the Query Builder window. After selecting columns

**Results** Here is the data table created by the query. In this result, notice that the Height column was named Height in the original table and renamed Meters in the output table. Activity and Type columns from the original table are not included here.



 5.3

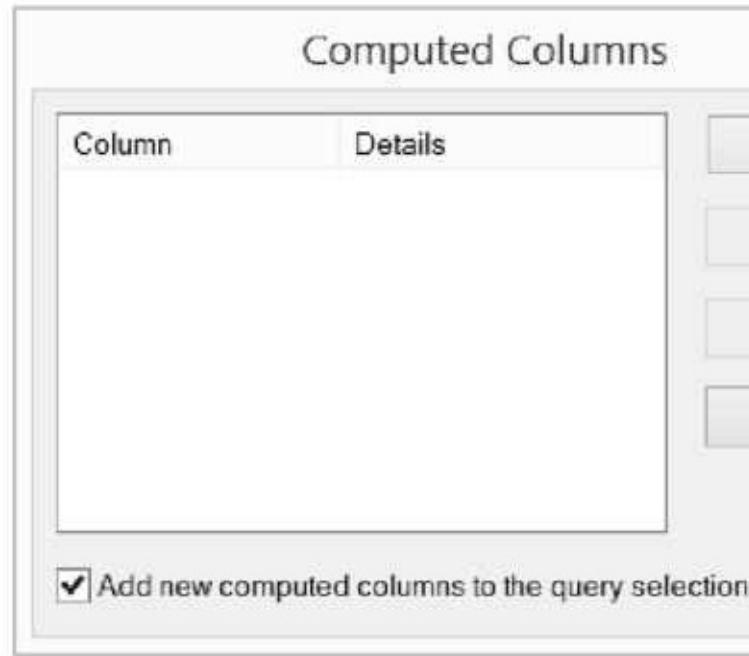
## Creating Columns Using the Query Builder

Sometimes you need to create a new column that contains a computed value. You can do this in a Data Grid, but then if you want to change the formula, you must recompute the new column for all rows.

Here is a portion of the Eruptions data set that is used for this example. Open the Query Builder by clicking the data icon in the Project Flow to make it active, and select the **Data ► Query Builder** from the menu bar.

The Query Builder opens with the **Available Columns** pane on top. Select the columns for the new query. In this example, the Volcano, StartDate, and Duration columns are selected.

**Creating a new column** To create a new column, click the **Computed Column** button located near the top of the pane. This opens the Computed Column dialog.



The New Computed Column wizard opens up to five windows depending on the type of column you are creating. In the first window, choose **Advanced Expression** and click **Next**.

**Building the expression** At the **expression** where you can type your expression or click the **Build** button to help you build the expression. The **Tables**, **Columns**, and **Selected Columns** buttons allow you to add tables, columns, and selected columns to the expression. To add a table, click the **Tables** button and select the table from the list. To add a column, click the **Columns** button and select the column from the list. To add a selected column, click the **Selected Columns** button and select the column from the list. You can also click the **Add** button to add a new column to the expression. You can click the **Remove** button to remove a column from the expression. You can click the **OK** button to save the expression and close the dialog.



Because the StartDate and EndDate columns are dates (e.g., 1953-01-01, 1960-01-01), you can simply subtract them to get the number of days between them. Once you have finished building the expression, click the Run button.

2 of 4 Build an advanced expression

Enter an expression:

```
t1.EndDate - t1.StartDate + 1
```

Home Next Back End Undo Redo

+ - \* / \*\* || (x) 'x' "x" , 'ab

Functions

Tables

t1 (Eruptions)

Selected Columns

Volcano

StartDate

EndDate

The maximum number of rows to process for this query is 1000. This value may be changed by modifying the 'MaxRows' property of the connection.

A screenshot of a software application window. At the top, there's a toolbar with several icons. Below the toolbar is a large, light-gray rectangular area with rounded corners, which appears to be a placeholder or a background for a dialog. In the center of this area, there's a smaller, white rectangular dialog box. The dialog box has a title bar with the word "New" on the right side. Below the title bar, there are four tabs labeled "1 of 4", "2 of 4", "3 of 4", and "4 of 4". The "3 of 4" tab is currently selected and highlighted in blue. To the right of the tabs, the text "Modify additional options" is displayed. The main body of the dialog box contains four input fields: "Column Name:" followed by a text input field containing "Duration"; "Label:" followed by an empty text input field; "Summary:" followed by a dropdown menu showing "NONE"; and "Expression:" followed by a text input field containing the expression "t1.EndDate - t1.StartDate + 1".

**Results** Here are the results of the query including the new column Duration. Notice that the values for Duration are missing for all rows where the values for EndDate and StartDate are missing. If you have missing values in any of the columns that are part of the expression, the results will be missing.

A more detailed example of creating a computed column can be found in

computera vorbind ca sa se rezolve in

 5.4

## Creating Columns Using Functions

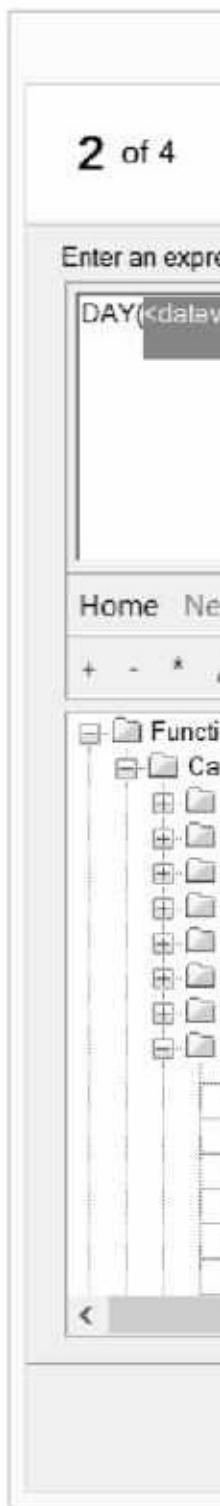
SAS Enterprise Guide has many built-in functions. One function takes a value and turns it into a number. Another function takes a date and returns just the day of the month. There are many functions for character, date and time, and math. These are described in the next section.

Here is a portion of the TourDates table that contains data on individual tour departures. The table includes the departure date. To create a column that contains the day of month the tour departs, click the **DAY** function. To open the Query Builder, click the data icon in the Project Tree, Flow to make it active, and select **Query Builder** from the menu bar. The Query Builder opens with the **Select Data** window. Select the columns for the query. In the

**Creating a new column** As shown in Figure 5.4, click the **Computed Columns** button in the **Columns** window (not shown). C

select **Advanced Expression** in the

**Choosing a function** In the second window, expand the **Functions** node located in the lower left portion of the window. The functions are listed alphabetically. To locate a function by category, expand the **Categories** node then expand the node for the desired function category. For this example, choose the **DAY** function from the **Date and Time** category. Clicking the function name will display information about the function in the lower right portion of the window. Double-clicking the function name will ad



clicking the function name with an 

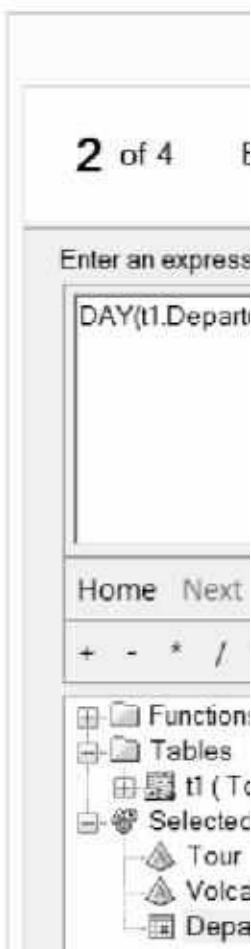
## Defining arguments for functions

the function is inserted into the expression. You must replace the placeholder for a character value enclosed in quotation marks. If the column is numeric, replace it with a numeric value.

Collapse the Functions node to display the available tables and selected columns. After adding a function to the expression, the placeholder for the function –

<datevalue> for this example – will be highlighted.

Double-click the desired column name, and the placeholder will be



Placeholder will be replaced by the column you selected, in this case the DepartureDate column from the



TourDates table (t1). If you want to can either type the value directly in the **Values** button to list discrete values or get all the values if your data table. After listing discrete values, either highlight the value and click **Select**

After you define your expression, (not shown) will open telling you to make any necessary changes, and can give the new column a meaningful name if desired. For this example, the new column will be named Day. Click **Run** in the Query Builder.

**Results** Here are the query results. You can see that the results now include the new column Day, which contains the day of the month the tour departs.



## 5.5 Selected Functions

The following table lists the defini

| Function name                 | Form of function                            |
|-------------------------------|---------------------------------------------|
| <b>Mathematical</b>           |                                             |
| LOG                           | LOG( <i>numValue</i> )                      |
| LOG10                         | LOG10( <i>numValue</i> )                    |
| <b>Descriptive Statistics</b> |                                             |
| MAX                           | MAX( <i>numValue</i> , <i>numValue</i> )    |
| MEAN                          | MEAN( <i>numValue</i> , <i>numValue</i> )   |
| MIN                           | MIN( <i>numValue</i> , <i>numValue</i> )    |
| SUM                           | SUM( <i>numValue</i> , <i>numValue</i> )    |
| <b>Character</b>              |                                             |
| CATS                          | CATS( <i>charValue</i> , <i>charValue</i> ) |
| LENGTH                        | LENGTH( <i>charValue</i> )                  |

|                                      |                                        |
|--------------------------------------|----------------------------------------|
| SUBSTR                               | <code>SUBSTR(charValue,<i>p</i></code> |
| UPCASE                               | <code>UPCASE(charValue)</code>         |
| <b>Date and Datetime<sup>1</sup></b> |                                        |
| DATEPART                             | <code>DATEPART(SAS-date-value)</code>  |
| DAY                                  | <code>DAY(SAS-date-value)</code>       |
| MDY                                  | <code>MDY(month,day,year)</code>       |
| MONTH                                | <code>MONTH(SAS-date-value)</code>     |
| QTR                                  | <code>QTR(SAS-date-value)</code>       |
| WEEKDAY                              | <code>WEEKDAY(SAS-date-value)</code>   |

---

<sup>1</sup> A SAS date value is the number of days since January



Here are examples using the selected functions:

| Function name                 | Example               |
|-------------------------------|-----------------------|
| <b>Mathematical</b>           |                       |
| LOG                           | LOG(1)                |
| LOG10                         | LOG10(1)              |
| <b>Descriptive Statistics</b> |                       |
| MAX                           | MAX(9.3,8,7.5)        |
| MEAN                          | MEAN(1,4,7,2)         |
| MIN                           | MIN(9.3,8,7.5)        |
| SUM                           | SUM(3,5,1)            |
| <b>Character</b>              |                       |
| CATS                          | CATS(' Hot', ' Lava') |
| LENGTH                        | LENGTH('hot lava')    |

|                          |                       |
|--------------------------|-----------------------|
| SUBSTR                   | SUBSTR('(916)734-6281 |
| UPCASE                   | UPCASE('St. Helens')  |
| <b>Date and Datetime</b> |                       |
| DATEPART                 | DATEPART(86400)       |
| DAY                      | DAY(0)                |
| MDY                      | MDY(1,1,1960)         |
| MONTH                    | MONTH(0)              |
| QTR                      | QTR(0)                |
| WEEKDAY                  | WEEKDAY(0)            |



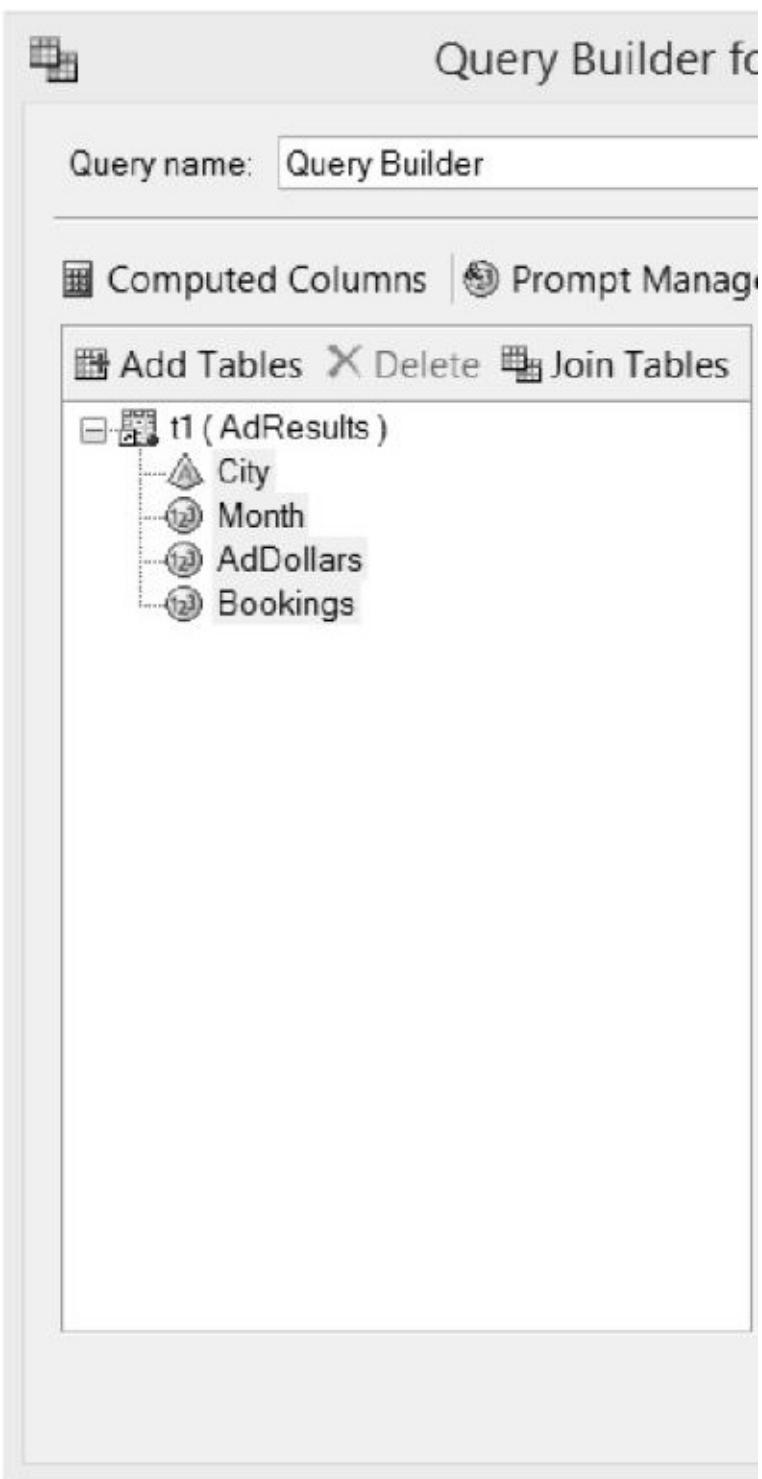
 5.6

## Adding a Grand Total

Using the Query Builder, you can add a grand total to your query results. For example, you could add a column to the AdResults table that contains the total amount spent by all offices for the time period. To open the Query Builder, click the data icon in the Interactive Process Flow to make it active, and then choose **Data ► Query Builder** from the menu bar.

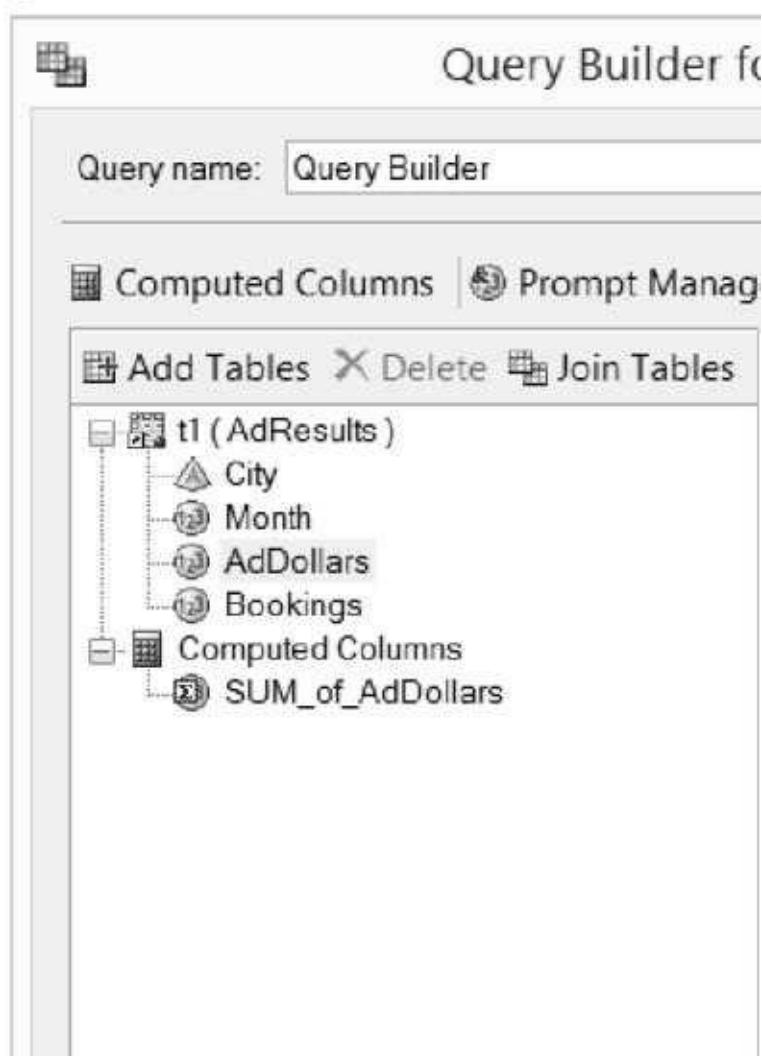
Here is a sample of the AdResults table. This table contains the amounts spent on advertising by the Fire and Ice Tours company for both its Portland and Seattle offices. This example shows how to add a new column that has the total amount spent by all offices for the time period. To open the Query Builder, click the data icon in the Interactive Process Flow to make it active, and then choose **Data ► Query Builder** from the menu bar.

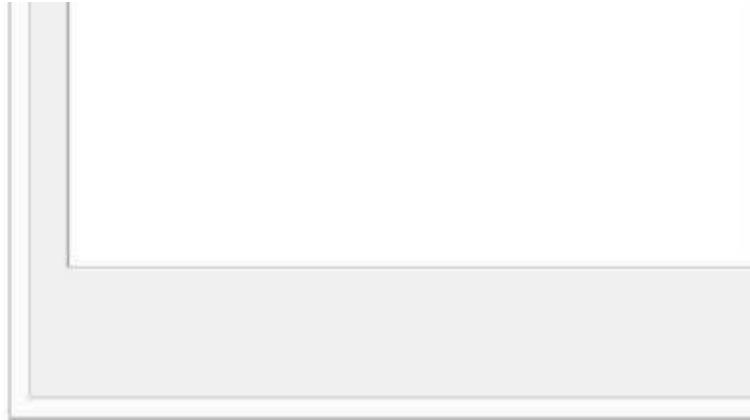
**Summarizing the data** First, select the AdResults table. Initially, no summary information is present in the table. To add summary data in a column, click the column header cell for the column you want to summarize. In this example, click the column header cell for the **Amount** column. Then click the **Summary** cell. Choose the summarization method. In this example, choose **SUM**.





**Selecting summary groups** will be replaced by the newly sum the summary groups. To create a g  
**Automatically select groups** in the groups are selected.





## Setting properties for the new column

the summary statistic and the old column's name.

the Properties window. Click the column name in the list on the right side of the Query Builder window.

**Adding back the original column** If you want to keep the original column, the original color, and the original width, click the original column name in the box containing the down-arrow buttons on the right side of the Properties window. In this example, the original column, Bookings, is positioned above the Bookings\_AdDollars column. When you are satisfied, click the **Run** button.

**Results** Here are the results of the query including the new column SUM\_of\_AdDollars. Notice that the new column has the same value for all rows.



 5.7

## Adding Subtotals to a

The previous section showed how to add a grand total to a data table. This section shows how to add subtotals to a data table. Subtotals are the same as adding a grand total to each row.

Here is a sample of the results from the previous section where the SUM\_of\_AdDollars column contains the grand total of the AdDollars column. In this example, the total amount spent by each city's office will be calculated instead of the grand total. Reopen the Query Builder by clicking the **Modify Table** button on the workspace toolbar for this section.

**Summarizing the data** Here we will summarize the data by city. We will use the same columns from the AdResults table as in the previous section, except for the AdDollars column. To change the grouping, click the **Edit Groups** button. This opens the Edit Groups dialog box.

## Query Builder

Query name: Query Builder

Computed Columns | Prompt Manager

Add Tables Delete Join Tables

t1 ( AdResults )

City  
 Month  
 AdDollars  
 Bookings

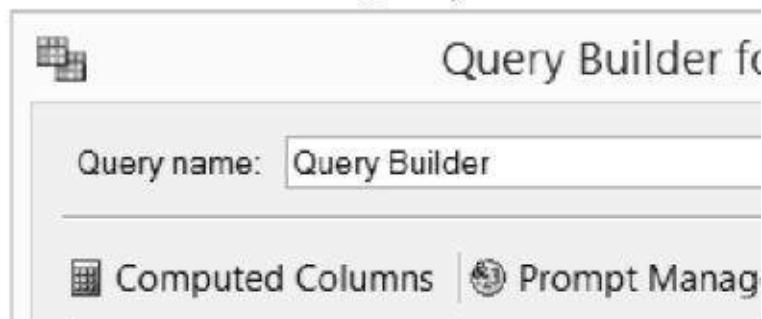
Computed Columns

SUM\_of\_AdDollars



**Selecting groups** In the Edit Groups window, select the columns to use for the groups. Click the column name, City for this example, in the **Available column** and click the plus arrow to add the **Group by** list. Click **OK** to return to the Query Builder window.

Notice that the name for the summarized column, in this case SUM\_of\_AdDollars, does not change. But now the grouping column, City from the AdResults table (t1), appears in the area labeled **Summary Groups** near the bottom of the window. Click **Run** to run the query.



The screenshot shows the Microsoft Query dialog box. The 'Add Tables' tab is active. A tree view on the left lists the table 't1 (AdResults)' and its columns: City, Month, AdDollars, and Bookings. Below this, under 'Computed Columns', is 'SUM\_of\_AdDollars'. At the top right of the dialog, there are buttons for 'Delete' and 'Join Tables'.

**Results** Here are the results of the query. Notice that the rows for Seattle have a different value for SUM\_of\_AdDollars than the rows for Portland. Also, the resulting data table is now sorted by the grouping column.



 5.8

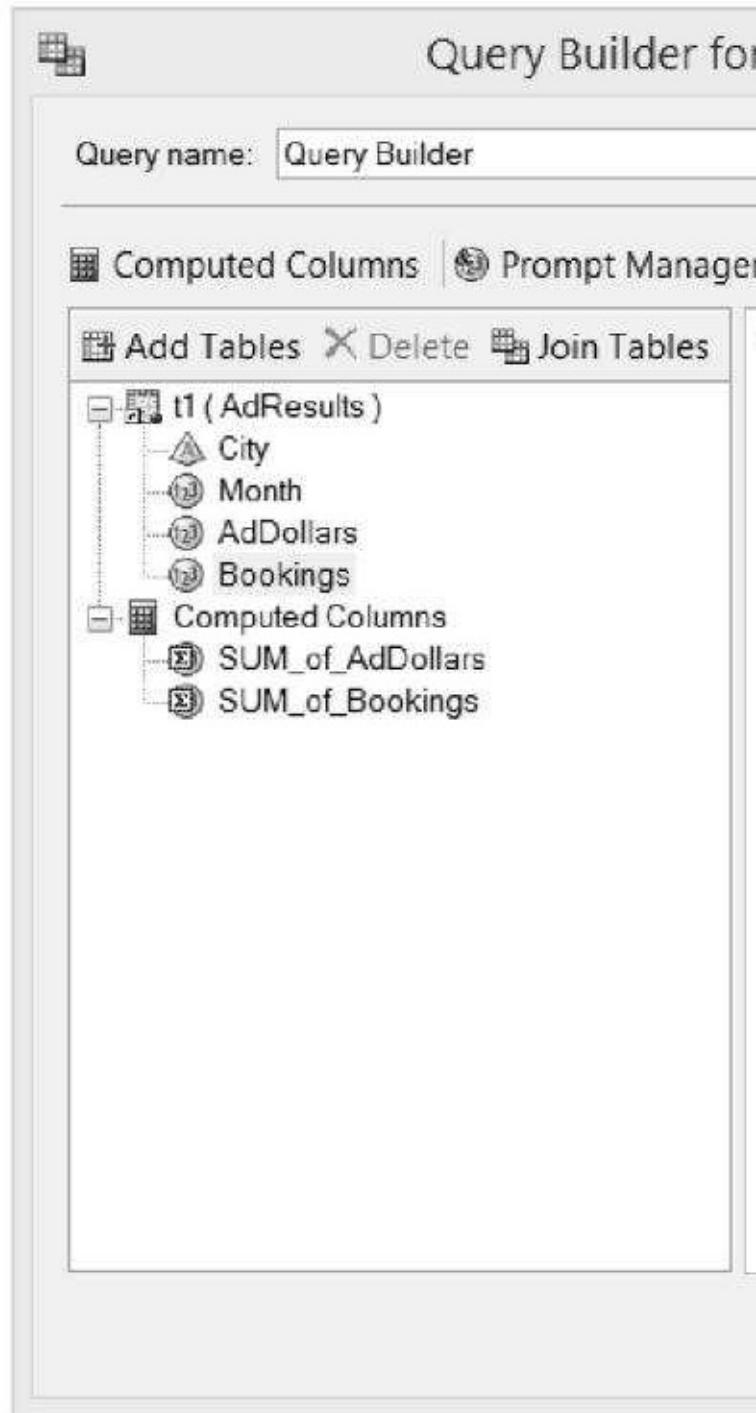
## Creating Summary Data

The previous section showed how to create summary data by grouping belonging to a group. The summary data is created for each group. But if you want only one record for each group, you can do this in a query by eliminating the GROUP BY statement.

Here is a sample of the AdResults table. This table contains the amounts spent on advertising by the Fire and Ice Tours company for its offices in Portland and Seattle. The table has four rows showing the total amount spent by each office and the amount spent by each office for each category. To create summary data with two rows showing the total amount spent by each office and the amount spent by each office for each category, open the Query Builder, click the data icon in the ribbon, and then click the Process Flow icon or Process Flow to make it active, and then click **Data ► Query Builder** from the menu bar.

**Select the summary and group columns** by clicking the column headers for the columns that will be either summarized or grouped. In the Query Builder, the drop-down list that appears when you click a column header is the Select Data tab. In this example, the column headers for the categories are selected. **Automatically select groups** is checked, so the category column is included in the group. For this example, the category column is included in the group.

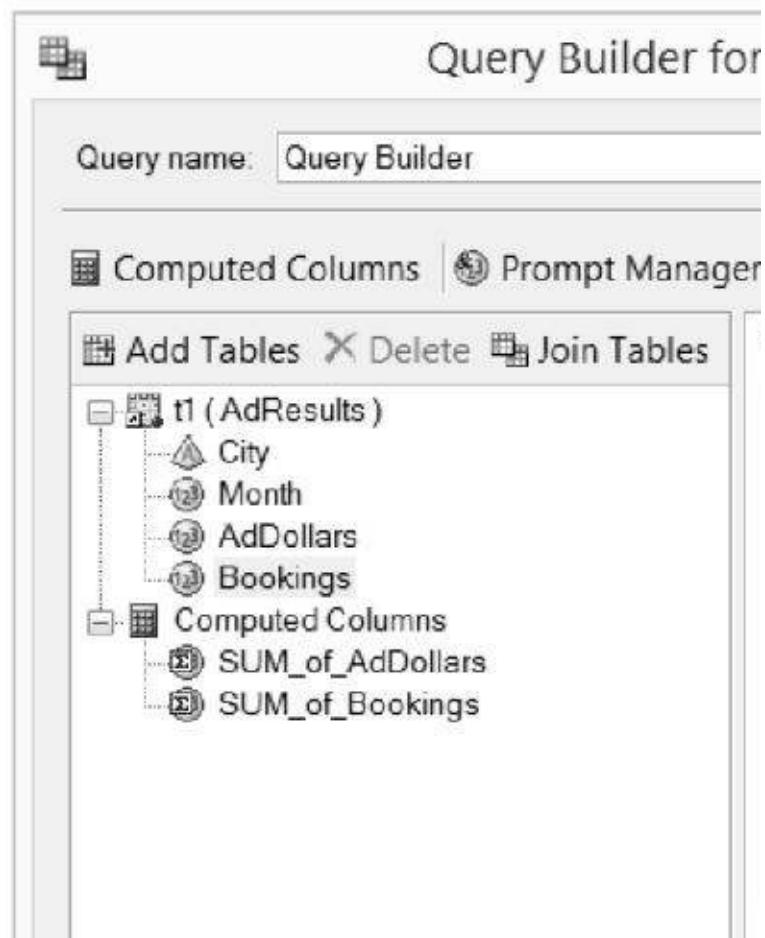
column selected for the query that

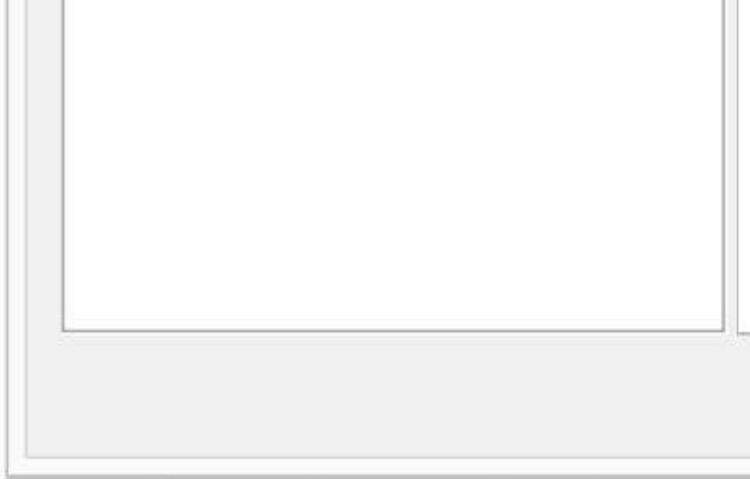




**Setting properties for the n**  
summarized columns combining t  
the name for the sum of the colum  
the name, you can change it in the

the **Select Data** tab of the Query B  
of the Query Builder to open the F





In the Properties window for the column, you can specify a new name, give the column a label, and change the format for the column. After making the desired changes to the properties, click **OK**. Then click **Run** in the Query Builder to produce the result. For this example, the name for the summarized column `SUM_of_AdDollars` is changed to `Total_Dollars_Spent`.

**Results** Here is the SAS data table containing the summarized data. The new table contains only one row value of the grouping column, City.



 5.9

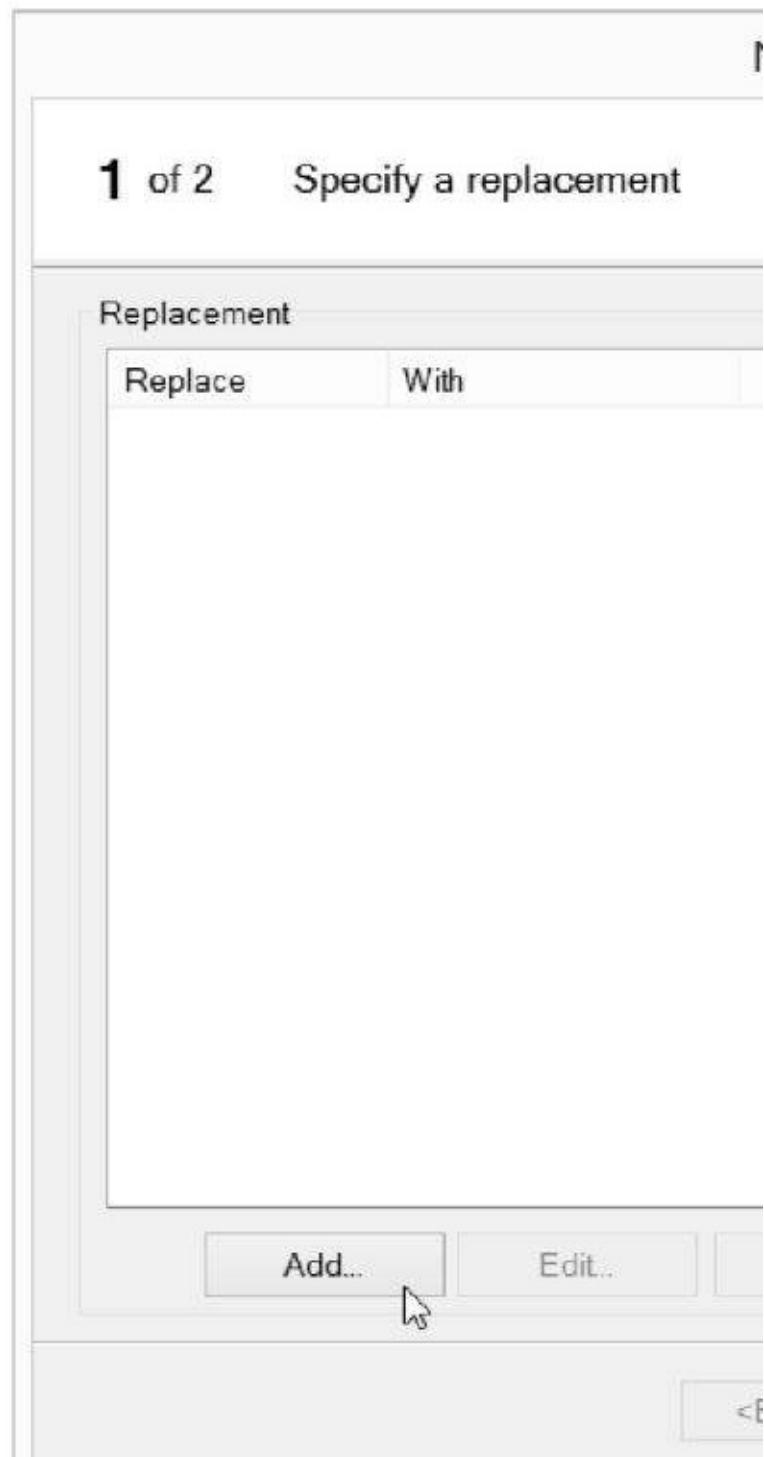
## Recoding Values in a Column

If you want to group data together by recoding a column in the Query Builder. If you have data for different cities, you may want to group the data by city. If you have data for different countries, then you can define it using a user-defined format and applying user-defined format to the newly computed column where the values are displayed in only the way the data values are defined.

Here are a few rows from the Latitude and Longitude data set. This data gives the latitude and longitude of various volcanoes around the world. Using the recode feature in the SAS Enterprise Guide, you can group the volcanoes by zeroing the values of the column Latitude. To open the Recode dialog, click the Data icon in the Project Tree or Project Explorer, and select **Tasks ▶ Data ▶ Recode** from the menu bar. This opens the Query Builder Recode dialog. Select the columns for the query. For this example, select the column Latitude.

**Creating the recoded column**  
Select the column Latitude for the recode (Latitude for this example). Click the **New** button. This opens the New Computed Column dialog.

In the first window, specify the type area labeled **Column Type**. For this Specify a Replacement window.





## Defining the replacements

**Replace Values, Replace a Range**  
replacements. It probably makes t  
data, but it can be used for charact  
consecutive range alphabetically.

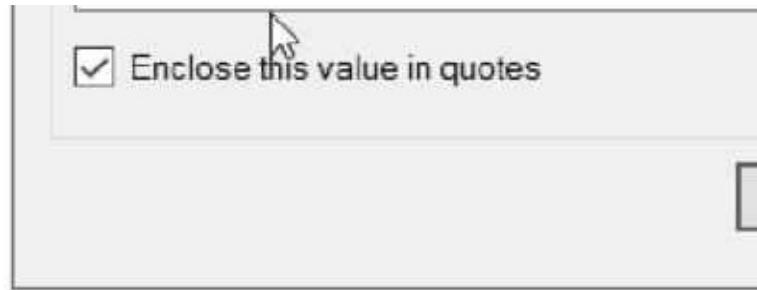
Specify a Replacement

Replace Values Replace a Range Replace

Set a lower limit  
-90

Set an upper limit  
-66.5

With this value:  
Antarctic



| Replacement    |                |
|----------------|----------------|
| Replace        | With           |
| -23.49...23.49 | 'Tropical'     |
| 23.5...66.49   | 'N. Temperate' |
| -66.49...-23.5 | 'S. Temperate' |
| 66.5...90      | 'Arctic'       |
| -90...-66.5    | 'Antarctic'    |

where the value of the column Latitude. In the second window of the wizard, you can also choose what to do with the values. For this example, replacing other values with quotes, click **Next**.

In the second window (not shown), choose the format. For this example, set the format to "Text". At this point, you can click **Next** to see the results. Then click **Run** in the Query Build window to run the query.

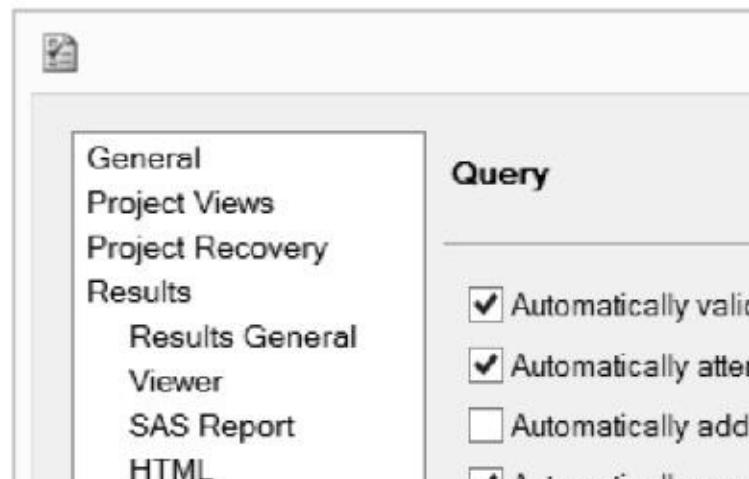
**Results** Here is a sample of the results. Notice that both the Latitude column and the new column, Zone, are part of the output.



## 5.10 Changing the Result Type

When you run a query using the **Run** button, the result type depends on what the query produces. A query can produce one or more results. A result view is similar to a SAS data table, and result views contain the instructions required to generate the results. Result views are generated by the Query Builder and are used for printing only.

**Setting the default result type** You can change the default result type. To do this, click the **File** menu. Click **Query** in the **File** menu. At the bottom of this page is a drop-down menu for the result type. All subsequent queries you run will use this result type.



- RTF
  - PDF
  - Graph
  - Excel
  - PowerPoint
  - Stored Process
- Data**
- Data General
  - Performance
- Query**
- OLAP Data
- Tasks**
- Tasks General
  - Custom Code
  - Output Library
- SAS Programs**
- File Comparison
  - Program History
  - Security
  - Administration
  - Application Logging

Automatically apply

Automatically conv

Automatically surro

Limit number of row

100,000

Number of distinct col

250

Number of rows to pro

Input:

1,000

Do not generate colur

32

Save query result set

Data table

Data table

Data view

Report

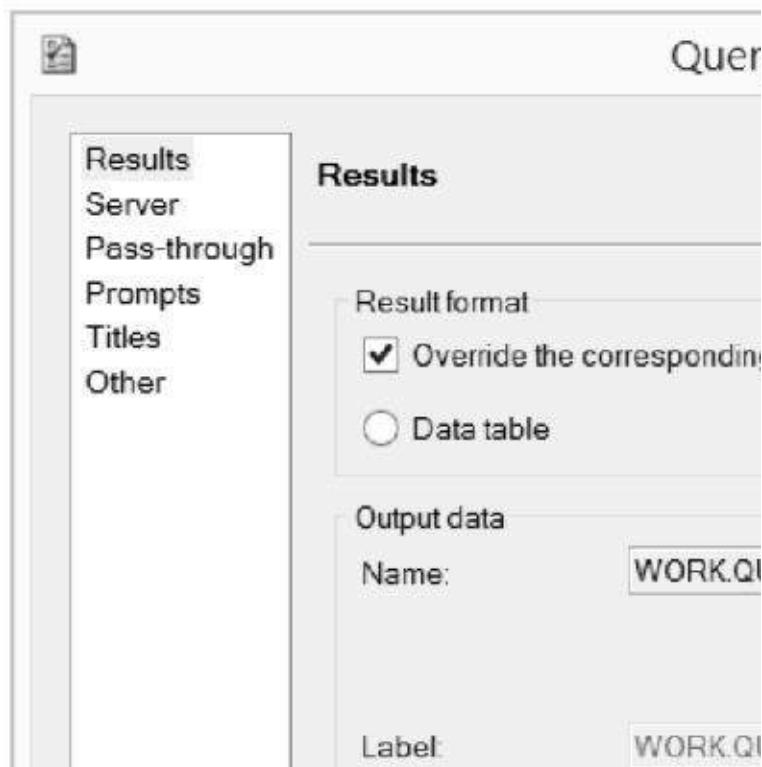
Data table - saves que  
Report - saves the que

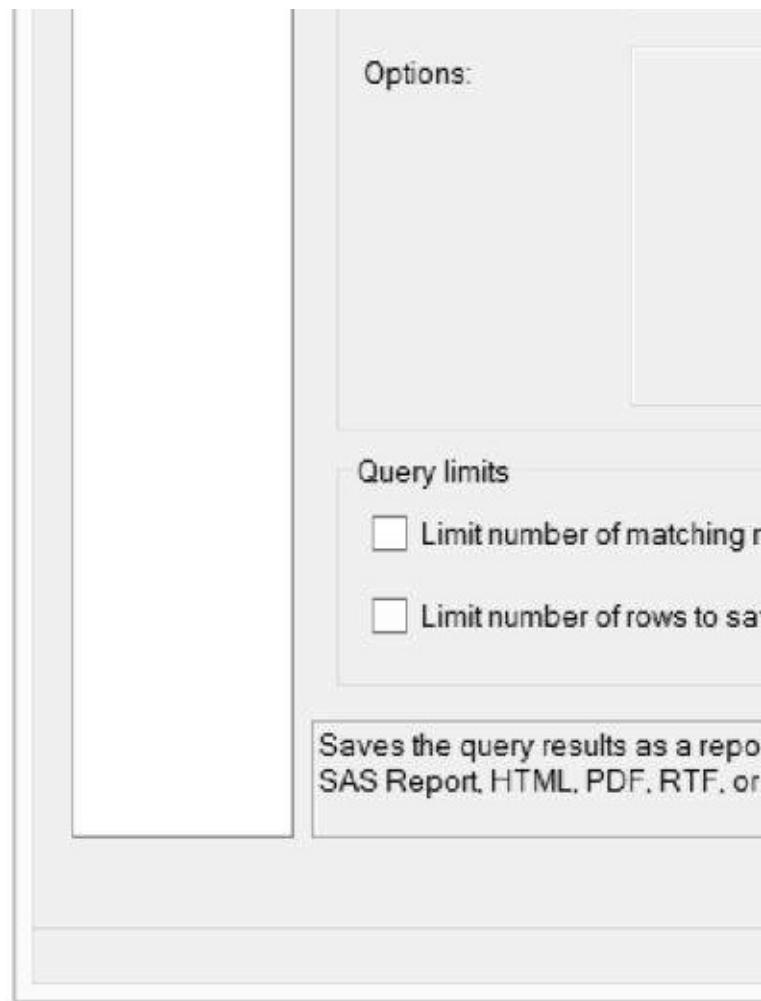
Reset All



**Setting the result type for a query**

To change the result type of an individual query, click the **Options** button in the Query Editor toolbar. A dialog box will open. Select **Options for This Query**. The **Results** tab will be selected by default. (Note that you can also click the **Default** button to open the **Results** tab for all queries, as shown on the previous page.)





**Query report** All the query examples in this book have shown the result as a table. Here is a partial view of a report generated from a query of the Volcanoes data table: the Volcanoes Report. Note that in query reports column labels are used instead of column names.





6

“ I find that the information acquired looks something like something

Attributed to Franklin P. Adan





# CHAPTER 6

## Sorting and

- 6.1 Filtering Data in a
- 6.2 Using the Filter an
- 6.3 Using the Sort Dat
- 6.4 Sorting Data in a C
- 6.5 Filtering Data in a
- 6.6 Creating Compou

## 6.7 Creating Advance



 6.1

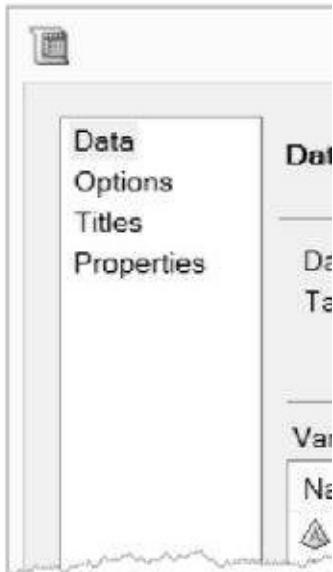
## Filtering Data in a Task

Sometimes you don't want to use the Filter task to filter data in SAS Enterprise Guide. If your goal is simply to create a new dataset from a subset of data, use the Extract and Sort task or the Query Builder.

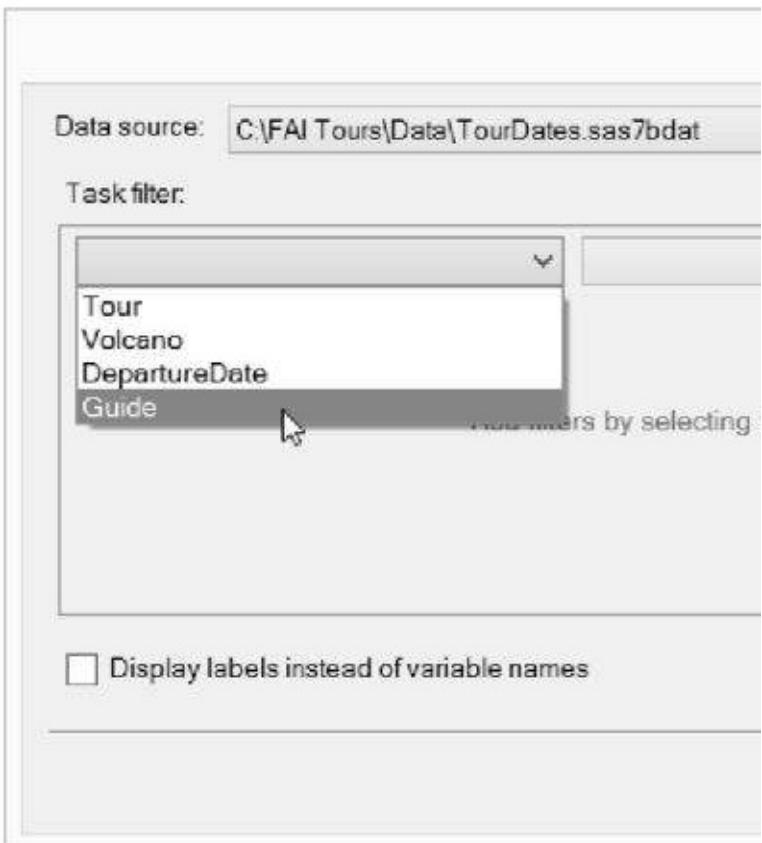
Here is the TourDates data table. I will show you how to use the List Data task to demonstrate how to filter data in a task. To open the List Data task, click the data icon in the Project Tree, then click the Flow icon in the Flow to make it active. Then select **Describe ▶ List Data** from the menu. A new List Data window will open, displaying all the variables in the data table. For this example, all the variables will be assigned to the List variables role.

**Editing the data source** The List Data task filter are displayed at the top of the page in the task window. By default, no filters are applied to data in a task. To add a filter, click the **Filter** button in the toolbar.

**Edit** button. This opens the Edit Data and Filter window.

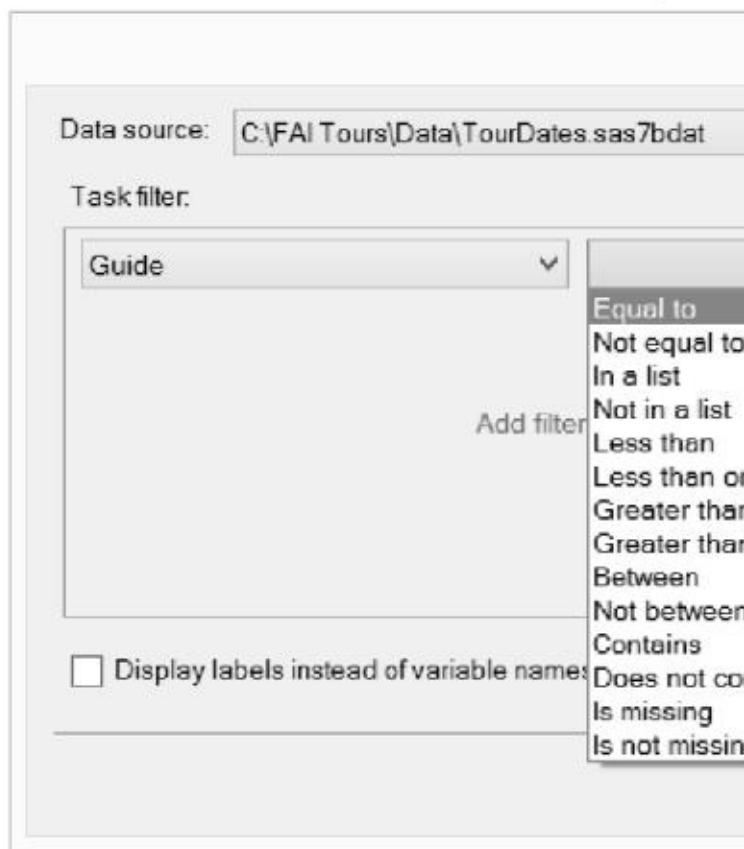


**Creating the filter** In the Edit contains four empty boxes. Click t you want to use for your filter froi





In the second box, select the opera



In the third box, either type in a va  
the selected variable. Select the de  
to the filter, select AND or OR fro  
will appear where you can specify  
the filter conditions, click **OK**.

Data source: C:\FAI Tours\Data\TourDates.sas7bdat

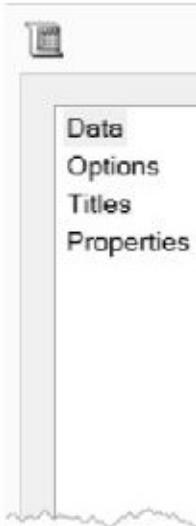
Task filter:

Guide Equal to

Add filters by selecting

Display labels instead of variable names

The filter you defined will appear in the **Task filter** area of the Data page in the task window. Click **Run** to run the task.



**Results** Here are the results of the task, showing only the rows of data that meet the condition where Guide is equal to



 6.2

## Using the Filter and Sort Task

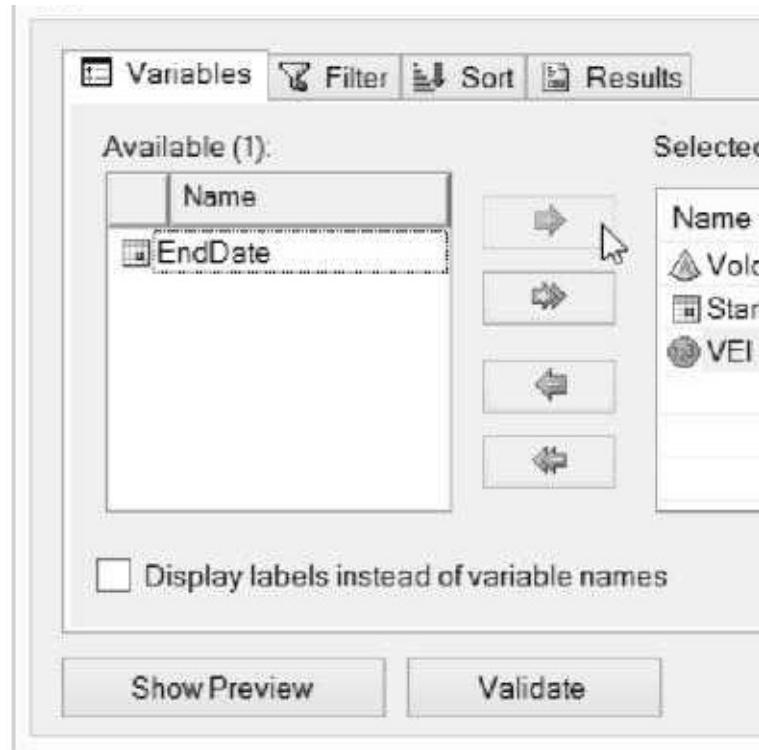
As the name suggests, the Filter and Sort task is a data table. If you need to filter and sort data, you can use the Query Builder. If you only want to filter and sort a specific dataset, however, you can use the Filter and Sort task (covered in the next section) instead.

Here is a sample of the Eruptions dataset after it has been filtered and sorted. The dataset is sorted by the volcano name and the time of the last eruption. To filter and sort the data, click the **Filter and Sort** icon in the Project Tree or Process Flow window. Make sure the **Filter and Sort** task is active, and select **Tasks ▶ Data ▶ Filter and Sort** from the menu bar. If you have a SAS Foundation license, you can also open the Filter and Sort task by clicking **Filter and Sort** on the workspace toolbar. The Filter and Sort window will open.

**Selecting variables** The Filter and Sort task allows you to select the variables you want to keep. Move the variables you want to keep to the **Keep** list by dragging and dropping, or using the **Move** button. You can also move variables to the **Drop** list by dragging and dropping, or using the **Drop** button. The **Keep** list contains the variables **Volcano**, **Y**, **X**, **Duration**, and **StartDate**. The **Drop** list contains the variables **Index**, **EndDate**, and **Time**.

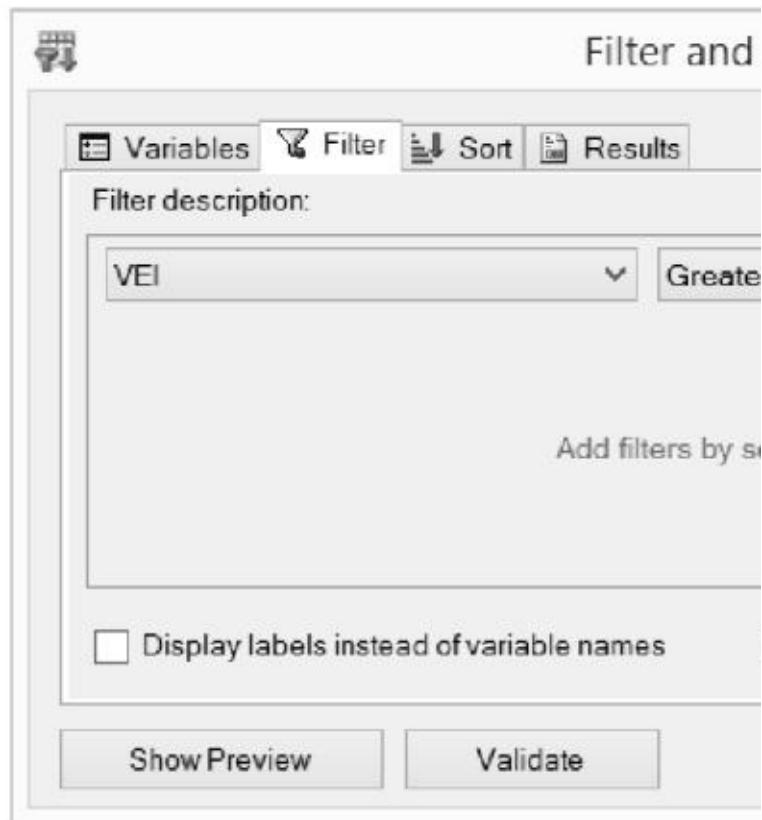


Filter and Sort



**Specifying the filter** Click the boxes. In the first box, choose the variable. Then in the third box, enter the value of the selected variable, click the ellipsis, select AND or OR from the drop-down where you can specify the additional functions or complex logic, click the window (not shown). In this example index (VEI) greater than or equal to





**Sorting the data** Click the **Sort** tab. If you want, you can choose a second variable to choose an additional variable, optional. The default sort order is Ascending. The data will be sorted by StartDate in OK.



Variables Filter Sort Results

Specify sort:

Sort by:

Then by:

Display labels instead of variable names

Show Preview Validate

**Results** Here are the results, which include only eruptions with V. The new data table is given a name FILTER\_FOR and is stored in a directory you can change the name and store it on the **Results** tab.



 6.3

## Using the Sort Data Task

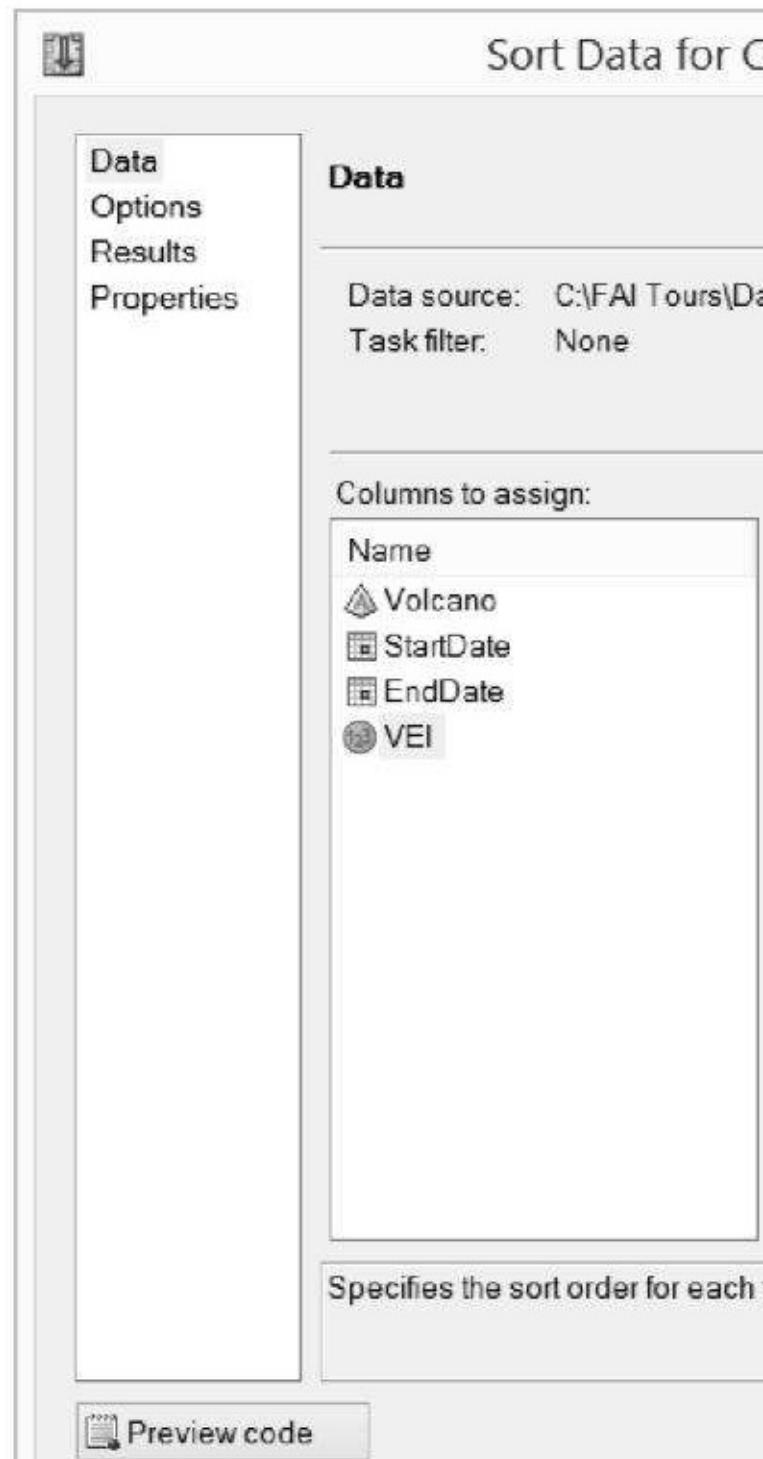
There is little need for you to sort data if it is already sorted, SAS Enterprise Guide will do it automatically most of the time. However, there are times when you want to sort the data yourself. You may want to store the data in sorted order or you may want to sort the data so that you do not have to sort the data and your report. You can use the Sort Data task to make it easier to find what you are looking for.

There are three ways to sort data in SAS Enterprise Guide: a task, a task, or a query. The Sort Data task is the easiest way to sort data while the Filter and Sort task and a query are more complex. This section discusses the Sort Data task.

Here is a portion of the Eruptions data set. To sort the data using the Sort Data task, click the Sort Data icon in the Project Tree or Project Explorer. Make sure the data set is active, and select **Tasks ► Sort Data** from the menu bar. The Sort Data task will open.

**Assigning task roles** Drag the

more than one **Sort by** column, **SA**  
the second column within values  
Sort by role, a box for the sort order  
can choose to have the data sorted



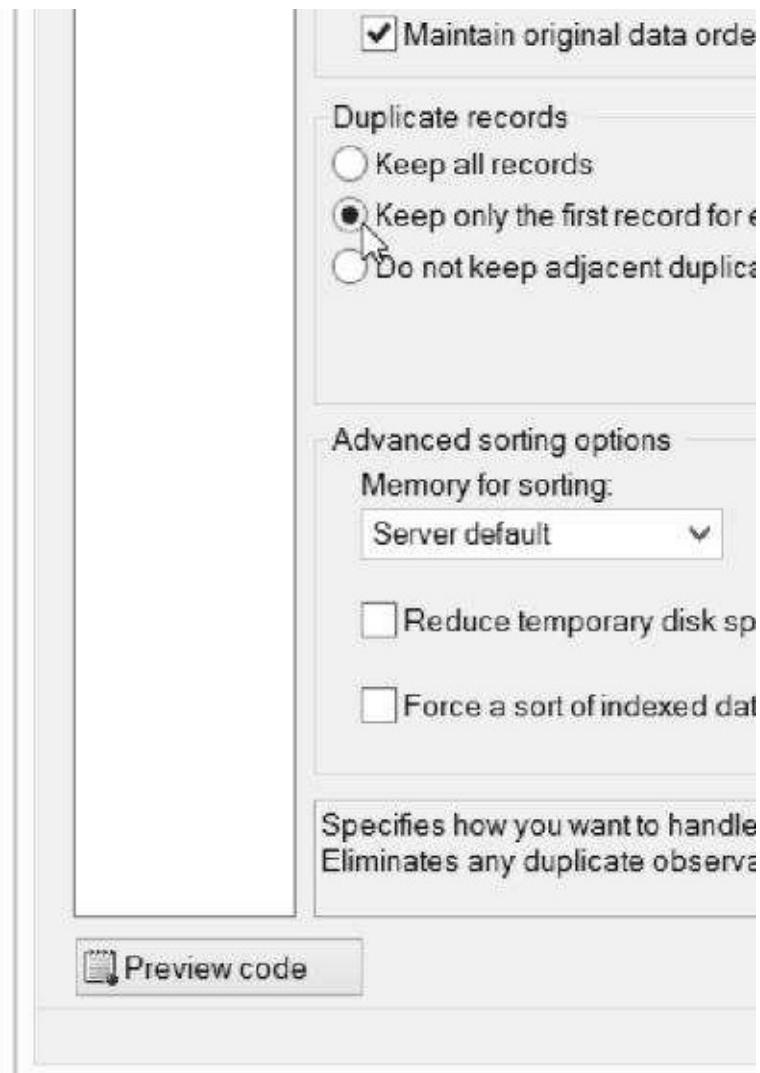


If you want to exclude columns from the query, you can right-click the column header and choose **Dropped**. In this example, the first column is sorted by name in ascending order, then by VEI in descending order, and the last column is dropped.

**Sorting options** To open the **Sort Data** dialog box, click the **Sort** button on this page, you can select the collating sequence, which determines the sort order. Vowel characters are always lowest in the sort order. In most computer systems (Windows), uppercase letters come before lowercase letters.

You can also choose options for displaying the results. You can choose to display only the first record for each combination of records if they are adjacent. For this example, the **Distinct** option is selected so that the result will have one row for each unique value. When you are ready to run the task, click the **Run** button.





**Results** The Sort Data task creates a new data table and displays it in a Data Grid. Notice that the data is sorted by the Volcano, and then by descending order of the P value. The resulting data table has fewer rows than the original data table because each observation contains only one row for each corresponding variable. SAS Enterprise Guide stores the table in memory until you save it to a location. To save the data with a different name, click the 'Save' button on the Results page in the Sort Data task. You can choose to save, in a separate table, all observations that were eliminated by the sort.



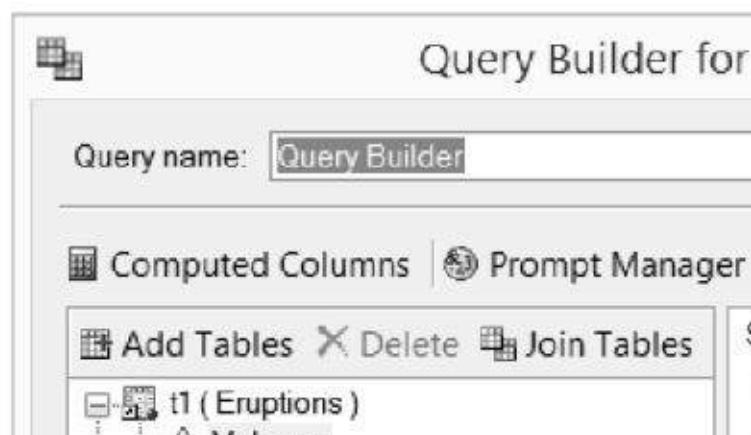
## 6.4

## Sorting Data in a Query

If all you want to do is create a sorted query, use the Sort Data, or Filter and Sort task. But what if you want to sort a data table, and create new column

This example uses the Eruptions data set. Open the data set, change the sort order using a query, make it active, and select **Tasks ► Sort and Filter**. The window will open with the **Select** tab active.

**Selecting the data** For all queries, click the **Add Tables** button. Click and drag the columns you want to include. The Eruptions table except VEI have been selected (Section 5.3 shows how to create the table).



|   | Volcano          |
|---|------------------|
|   | StartDate        |
|   | EndDate          |
|   | VEI              |
| + | Computed Columns |
|   | Duration         |

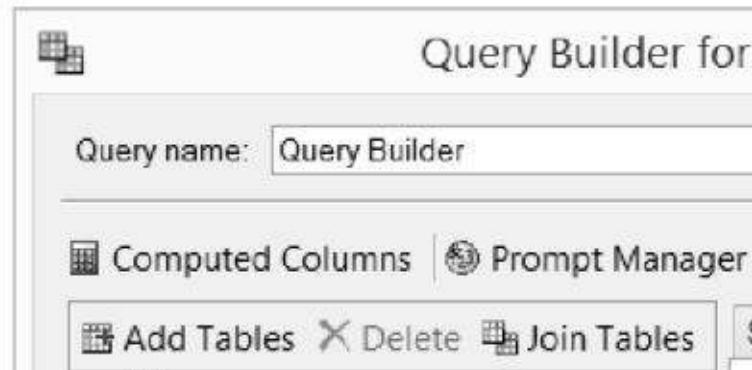
Here is a portion of the data table running the above query before a data table contains the new computed column Duration.



**Sorting the data** To sort the data, click the **Sort Data** button on the workspace toolbar for the query results. Select the column you want to sort by from the list on the left and drag it to the list on the right. You can also click the **Up** and **Down** arrows to drag multiple columns to the right. If you drag a column to the right and it doesn't appear in the result, click the **Run** button to refresh the results.

If you choose more than one column to sort by, the first column you choose will determine how the data are sorted. Then, within unique values of the first column, the second column will be used. You can change the sort order by clicking the **Up** and **Down** arrows next to the column name on the **Sort Data** list.

To change the sort order of a column, click the **Up** or **Down** arrow buttons next to the column name on the **Sort Data** list. Select the column you want to sort by, click the **Up** or **Down** arrow buttons next to the column name on the **Sort Data** list, select the column you want to sort by, and select either **Ascending** or **Descending**. Click the **Run** button to refresh the results.



| t1 ( Eruptions ) |  |
|------------------|--|
| Volcano          |  |
| StartDate        |  |
| EndDate          |  |
| VEI              |  |
| Computed Columns |  |
| Duration         |  |

**Results** Here is a portion of the data table sorted first by Duration ascending order, then by StartDate descending order. Missing values lowest in the sort order, so they appear at the top.



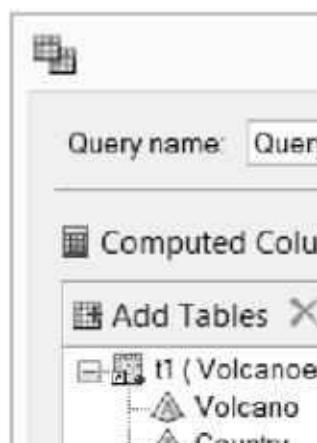
## 6.5

## Filtering Data in a Query

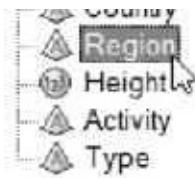
If you want to create a data table to filter data, you can use the Filter Data task or the Query Builder. The Filter Data task is useful for filtering data from a single table. The Query Builder can also create computed columns.

Here is a sample of the Volcanoes table. To filter the data so that only volcanoes in North America and South America appear in the results, click the **Query** icon in the Project Tree or Project Flow and select **Tasks ▶ Data ▶ Query Builder** from the menu bar. This creates the Query Builder window, with the query result (in this example empty) on the **Data** tab.

Select the column that you want to use for filtering purposes and drag it to the **Filter Data** tab.



Notice that you can filter by columns that are not even part of the query result. In this example, drag **Region** to the filter area. When you drop the column, the New Filter wizard will open.



**Building the filter** In the New Filter dialog box, drag the **Region** column to the filter area. Initially, the down-arrow in the **Operator** box is grayed out because it allows you to specify a value only if the column is part of the query result.

After choosing an operator, choose values in the **Values** box or let SSMS suggest values from the list arrow next to the **Values** box. In this example, the list shows all possible values for the column. If there are many possible values, it can take a long time to scroll through them. Instead, hold down the control (CTRL) key while dragging the list arrow up or down and then click **OK**. The values will appear in the **Values** box.



## 1 of 2 Build a basic filter

Source Column: t1.Region

Column Name: Region

Operator: In a list

Generate filter for a prompt value

Values:

t1.Region IN

(

"

)

Enclose values in quotes



Once you have set the filter condition summary of your filter in the second tab, then click **Finish**. The filter will appear in the third tab of the Query Builder window. This query selects all rows from the Volcanoes table where the continent has the value of NA or SA. Click **Run** to run the query.

**Results** Here is the data table produced by the query. Notice that only the volcanoes in North America and South America are included.

Tutorials C and D give more detail on how to filter data in a query.



 6.6

## Creating Compound I

Sometimes you want to base a filter using the AND and OR operators. In the Query Builder, but you can create compound filters.

In the previous section, the Volcar query, click **Modify Task** on the toolbar. In the Modify Task window, click the **Filter Data** tab.

### Adding conditions to a filter

To add a condition to an existing filter, drag the column for the new condition from the column list to the **Filter Data** tab. For this example, drag the Country column to the **Filter Data** tab. When you drop the column, the New Filter wizard will open.

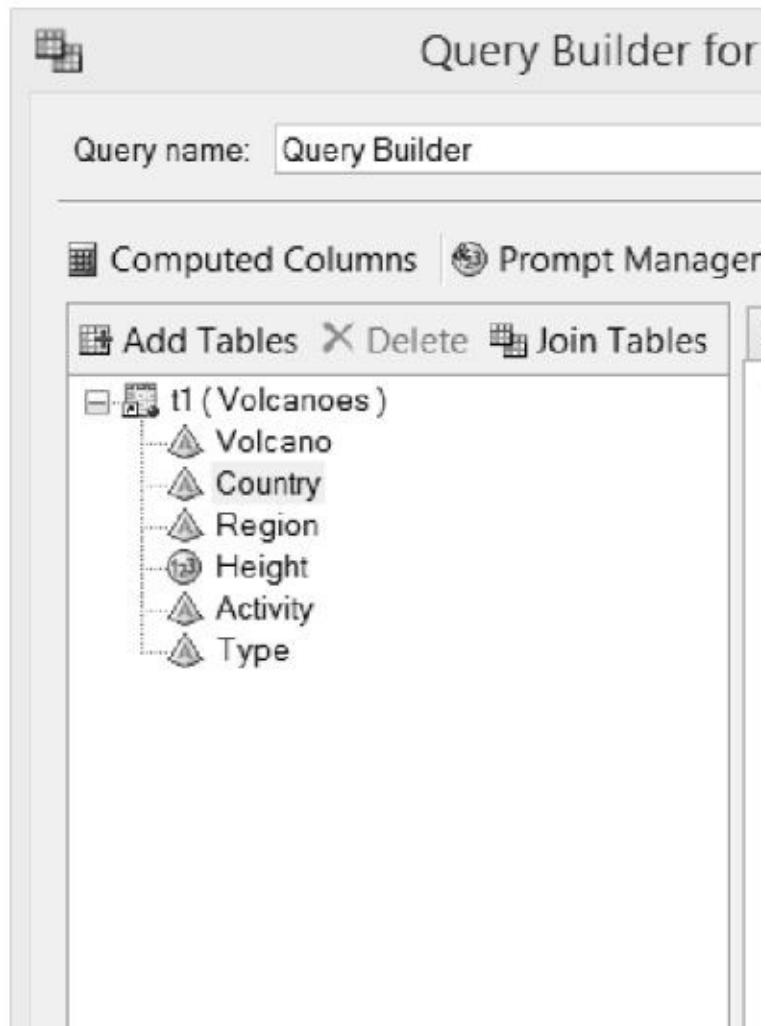
1 of 2 Build a basic filter

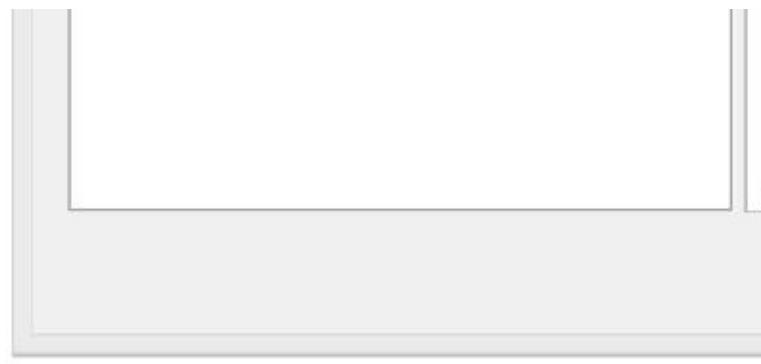
|                                                              |                                    |
|--------------------------------------------------------------|------------------------------------|
| Source Column:                                               | t1.Country                         |
| Column Name:                                                 | Country                            |
| Operator:                                                    | Equal to                           |
| <input type="checkbox"/> Generate filter for a prompt value  |                                    |
| Value:                                                       | <input type="text" value="Japan"/> |
| t1.Country = 'Japan'                                         |                                    |
| <input checked="" type="checkbox"/> Enclose values in quotes |                                    |
| <a href="#">&lt;Back</a>                                     |                                    |

**Building the Filter** The process you were creating a single condition, and then either type the condition, or click the ellipsis next to the Value box to get a list of values where the Country column from the table are satisfied. Click **Next** to see a summary of the filter.



**Setting the logic** After you create a filter condition on the **Filter Data** page, add additional conditions to your filter, SAS Enterprise Guide changes the operator from AND to OR, click the down-arrow button, and then select the operator to **OR**. Click **Run**.





**Results** Here is the new data table after filtering the Volcanoes data to include the volcanoes from North America. The volcanoes from South America are included, as well as a few from Japan.



 6.7

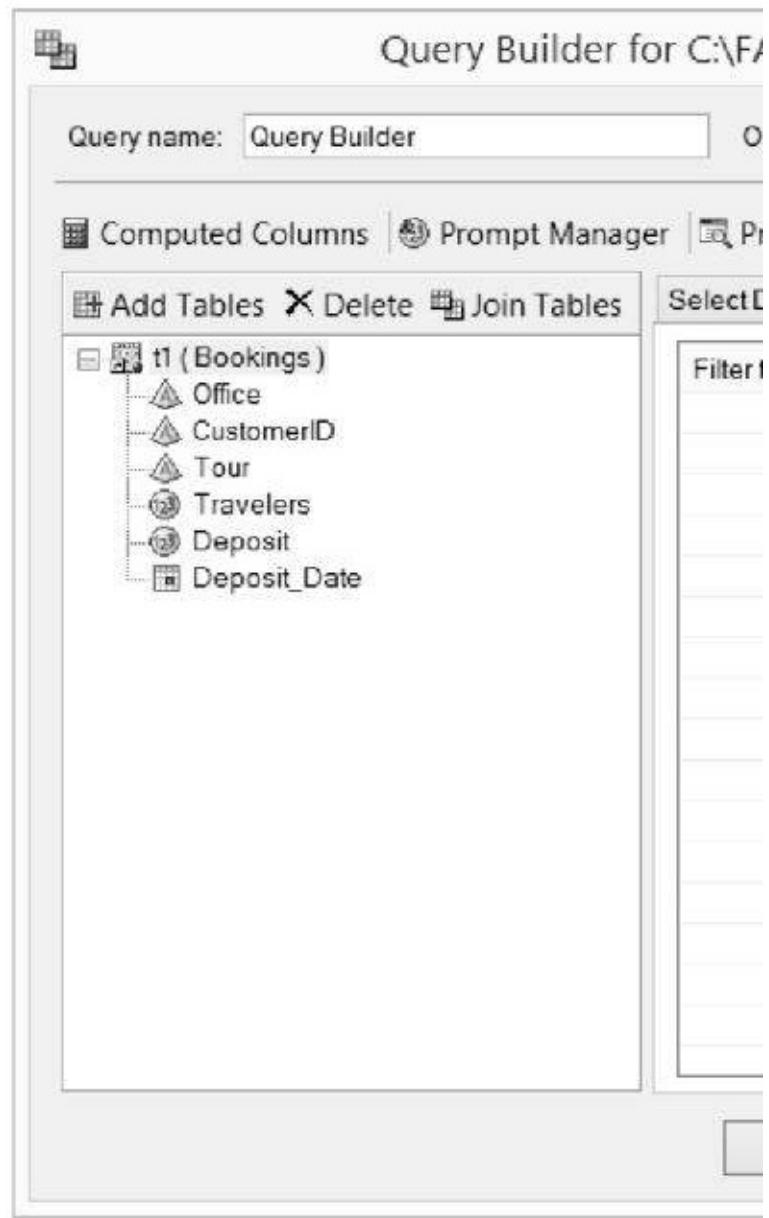
## Creating Advanced Fi

You can accomplish a lot with basic expressions, functions, or more complex logic. You can create an advanced filter. This section shows how to do this in the Query Builder, but you can also create filters in the Data View.

Here is a portion of the Bookings data table. This example uses the SUBSTR function in the Query Builder to select rows where the CustomerID starts with the letters “DE.” To create a query, click the data icon in the Project Tools ribbon from the menu bar. This opens the Data View window. Click the **Filter Data** tab.

## Opening the advanced filter

In the Data View window, click the New Filter icon in the toolbar to open the Filter wizard.

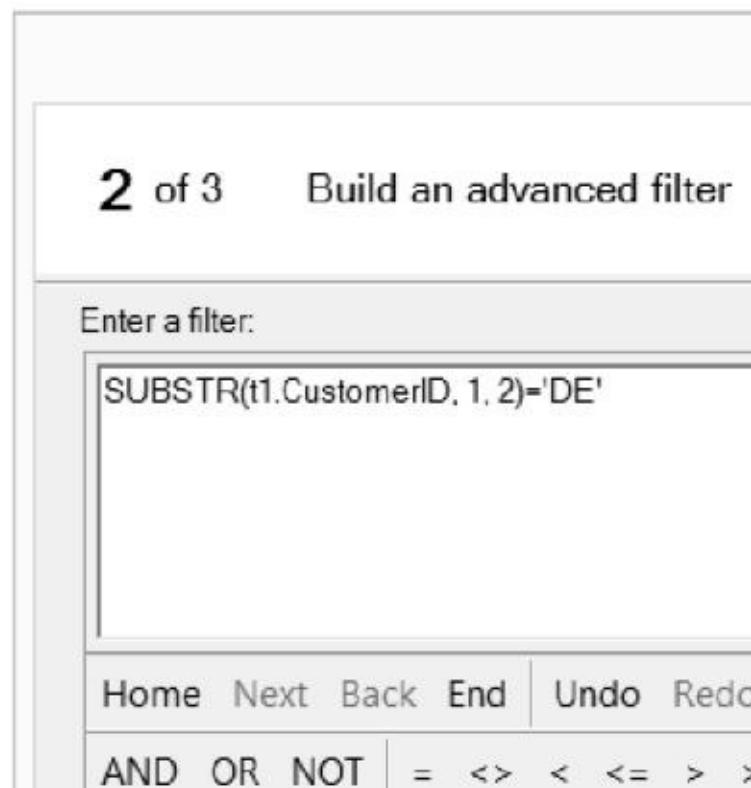


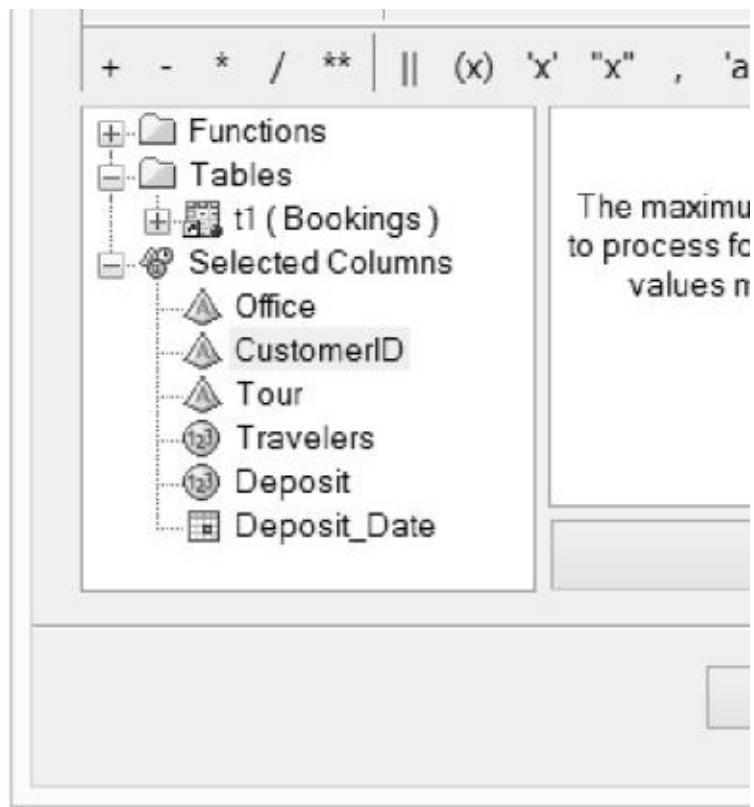
The New Filter wizard has up to four steps, depending on which type of filter you select. In this example, we will use the **Advanced Filter** and click **Next**. (I will explain how to use the **Advanced Edit** button on the last page.)



## **Building the advanced filter**

the text box labeled **Enter a filter**. Clicking the Functions node in the box on the left will open a help window. Clicking the Help button in that window will display help for that function. All the columns in the table are also listed in this box. In this example, we enter the first two characters of the CustomerID column, “DE.” When you are finished building the filter, click the **Next** button in the third window (not shown), then





Your filter will appear on the **Filter Builder**. Click **Run** to run the query.

**Results** Here is the new data table produced after filtering the Bookings data table. Only the rows with a CustomerID that starts with the letters “DE” appear.





“Learni  
is labor los  
learning is

From *Analects* Bk. II, Ch. XV. A  
*Modern Foreign Languages* by Je





# CHAPTER 7

## Combining

- 7.1 Methods for Combi
- 7.2 Appending Tables
- 7.3 Joining Tables 25
- 7.4 Setting the Proper





## 7.1 Methods for Combining Tables

In SAS Enterprise Guide, there are two ways of combining tables: appending and joining. You append when the tables have different column names or when the tables contain the same columns but different terms, what happens when you combine them?

**Appending tables** Appending is the easiest way of combining tables if they have columns in common. This is the case when the tables have the same structure, which is described in the next section.

|   |   |   |
|---|---|---|
| a | ~ | ~ |
| b | ~ | ~ |
| c | ~ | ~ |

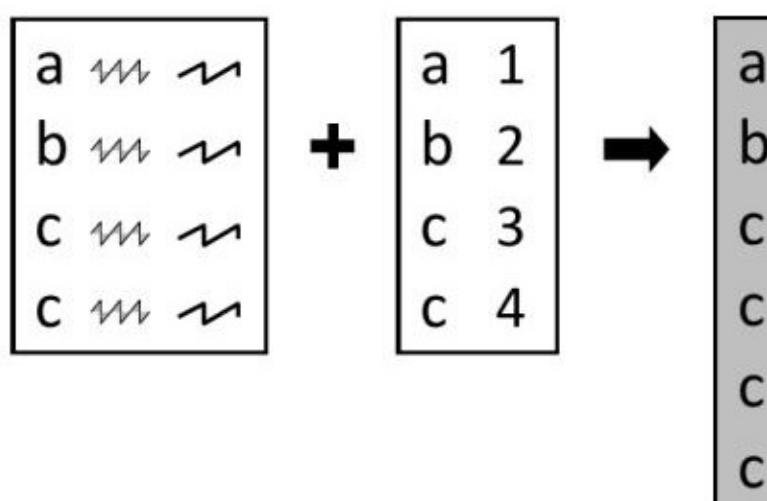
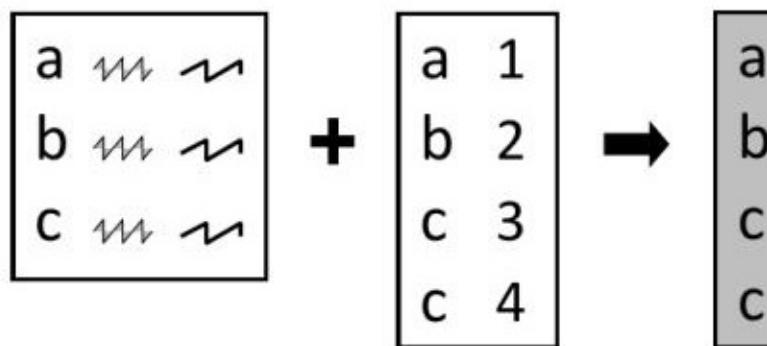
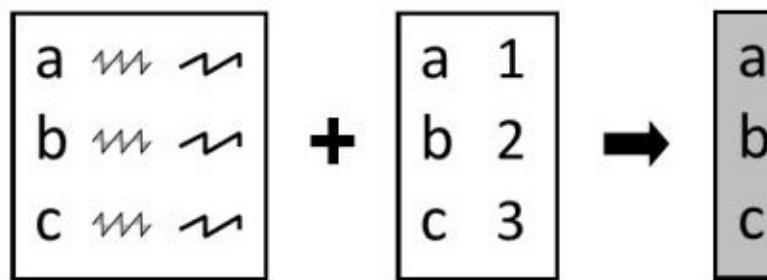


|   |   |
|---|---|
| g | ~ |
| h | ~ |

|   |   |   |
|---|---|---|
| a | ~ | ~ |
| b | ~ | ~ |
| c | ~ | ~ |
| g | ~ | . |
| h | ~ | . |

**Joining tables** To join tables together, you must have at least one column in common between them.

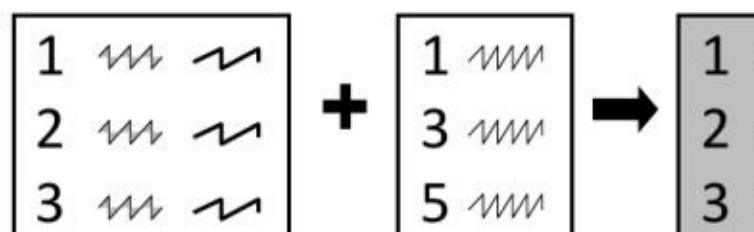
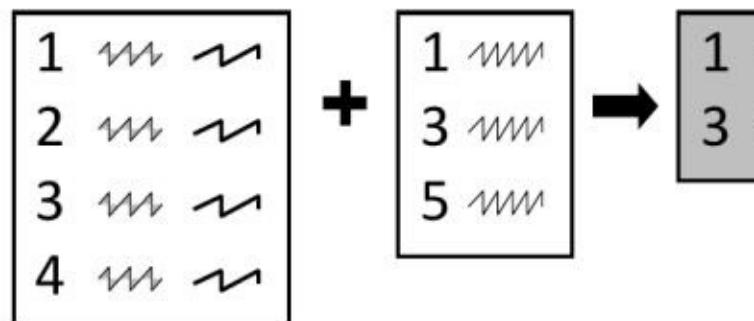
that can be used to match rows. 1-to-1, 1-to-many, or many-to-many – SAS is done in the Query Builder, which





When you join tables together, one from each table. By default, any non-equi joins are inner joins. In the Query Builder, you can control whether the join is inner or outer (the icon in the join line indicates where the join came from). The Query Builder illustrates this with join indicators (see the diagram). The join indicator consists of two parts: a plus sign and a minus sign. It shows which parts of the tables are included in the result set. There are four types of joins: inner joins, left joins, right joins, and full outer joins. These are explained in section 7.4.

The following graphics all show a join between two tables. The different rows are included in the result set.



$$\begin{array}{|c|} \hline 4 & \diagup & \diagdown \\ \hline \end{array} \quad \begin{array}{|c|} \hline 4 \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline 1 & \diagup & \diagdown \\ \hline 2 & \diagup & \diagdown \\ \hline 3 & \diagup & \diagdown \\ \hline 4 & \diagup & \diagdown \\ \hline \end{array} + \begin{array}{|c|} \hline 1 & \diagup & \diagdown \\ \hline 3 & \diagup & \diagdown \\ \hline 5 & \diagup & \diagdown \\ \hline \end{array} \rightarrow \begin{array}{|c|} \hline 1 \\ \hline 3 \\ \hline . \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline 1 & \diagup & \diagdown \\ \hline 2 & \diagup & \diagdown \\ \hline 3 & \diagup & \diagdown \\ \hline 4 & \diagup & \diagdown \\ \hline \end{array} + \begin{array}{|c|} \hline 1 & \diagup & \diagdown \\ \hline 3 & \diagup & \diagdown \\ \hline 5 & \diagup & \diagdown \\ \hline \end{array} \rightarrow \begin{array}{|c|} \hline 1 \\ \hline 2 \\ \hline 3 \\ \hline 4 \\ \hline . \\ \hline \end{array}$$



## 7.2

## Appending Tables

You use the Append Table task to append tables. For example, if you had two tables, you could append the table from one to the other.

In this example, a customer living in Portland wants to compare flight prices between Portland and Ice Tours company. Because the two cities have different flight prices, he wants to see prices for flights from each city.

Here are two data tables, one showing flight prices from Portland and the other from Ice Tours. Looking at these two data tables, you can see that they contain the same columns, making them good candidates for appending.

To append tables, click one data icon in the Project Tree or Process Flow to make it the active table, and then select **Tasks ▶ Data ▶ Append Tables** from the menu bar. The Append Table Task dialog will open.

## **Adding tables**

The Append Table window opens showing the active table. To add a table, click **Add Table**, navigate to the table you want to add, and click **OK**. The table names will appear in the **Tables to append** section of the window. You can append up to 256 tables at once.





**Running the task** After adding all the desired tables (Portland and Seattle for this example), you can click **Run** and SAS Enterprise Guide will create the new table, store it in a default location, and give it the name **Append\_Table**. (If you have more than one appended table stored in that location, SAS Enterprise Guide



will add numbers to the name.) To choose a different name or location. Then click **Browse** in the Results pane.



In the Save File window (not shown), enter a name and choose a library. To see the available libraries, click the arrow at the top of the window. In this example, we save the new table in the SASUSER library. Once you have selected the library and file type, click **OK** in the Append Table window, click **Run**, and then click **OK** again.

**Results** Here is the new data table that SAS Enterprise Guide concatenated from the Seattle tables by matching the

In this case, the two tables contain the same columns. If there had been a column that existed in one table but not the other, the new column would contain missing values for the rows from the other table.



 7.3

## Joining Tables

When you append tables, you must match rows. For example, a teacher wants to add grades from tests in another. To combine the two tables, you can append them and test scores for each student. This section shows how.

In the preceding section, two tables were created to store the data about flights. Now the data needs to be joined to create one table for flights. To open the Query Builder, click the **Start** button, click **SAS**, and then click **Query Builder**. You can also click both data icons in the Project Tree, click **File**, and then click **New Query**. The data tables will appear in the Project Tree or the Data View window.

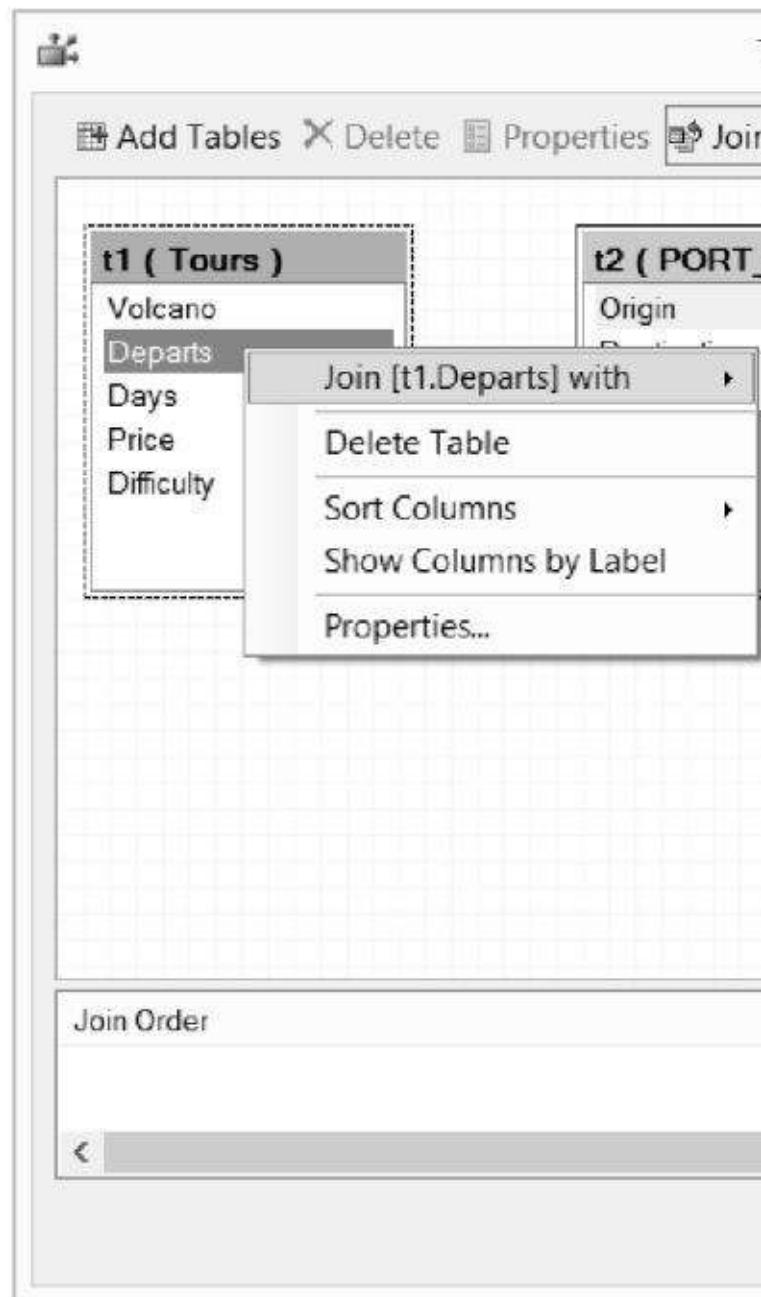
|   | Volcano     | Departs  | Days | Flight | Flight |
|---|-------------|----------|------|--------|--------|
| 1 | Etna        | Catania  | 7    | \$     | \$     |
| 2 | Fuji        | Tokyo    | 2    | \$     | \$     |
| 3 | Kenya       | Nairobi  | 6    | \$     | \$     |
| 4 | Kilauea     | Hilo     | 1    | \$     | \$     |
| 5 | Kilimanjaro | Nairobi  | 9    | \$     | \$     |
| 6 | Krakatau    | Jakarta  | 7    | \$     | \$     |
| 7 | Poas        | San Jose | 1    | \$     | \$     |
| 8 | Reventador  | Quito    | 4    | \$     | \$     |
| 9 | St. Helens  | Portland | 2    | \$     | \$     |

**Specifying the join columns** When you open multiple tables in the Query Builder, SAS Enterprise Guide will automatically look for columns with the same name and type. If SAS Enterprise Guide does not find any columns with the same name and type, then a warning message will appear telling you to window will open.

To join two tables manually, click select the name of the matching column from one column to the other table, the destination of a flight in this example, click the Tours tab. Destination from the pop-up menu; in this example, accept the default setting.

You can use more than one column for matching. For example, if you want to join homework and test scores based on student ID, select the student ID column for matching, select them both, and then click OK.





**Running the query** If you na results, then drag those columns to satisfied, click **Run**. SAS Enterpris

**Results** This Data Grid shows the columns used for matching (Departs the same name (such as City), then of the second column (resulting in Nairobi, and two flights with a de Enterprise Guide kept only the row of join. To keep rows that don't ma

|    | Volcano     | Departs  | Days | F  |
|----|-------------|----------|------|----|
| 1  | Etna        | Catania  | 7    | \$ |
| 2  | Etna        | Catania  | 7    | \$ |
| 3  | Fuji        | Tokyo    | 2    |    |
| 4  | Fuji        | Tokyo    | 2    |    |
| 5  | Kenya       | Nairobi  | 6    | \$ |
| 6  | Kenya       | Nairobi  | 6    | \$ |
| 7  | Kilauea     | Hilo     | 1    |    |
| 8  | Kilauea     | Hilo     | 1    |    |
| 9  | Kilimanjaro | Nairobi  | 9    | \$ |
| 10 | Kilimanjaro | Nairobi  | 9    | \$ |
| 11 | Krakatau    | Jakarta  | 7    | \$ |
| 12 | Poas        | San Jose | 1    |    |
| 13 | Poas        | San Jose | 1    |    |
| 14 | Reventador  | Quito    | 4    |    |
| 15 | Vesuvius    | Rome     | 6    | \$ |
| 16 | Vesuvius    | Rome     | 6    | \$ |

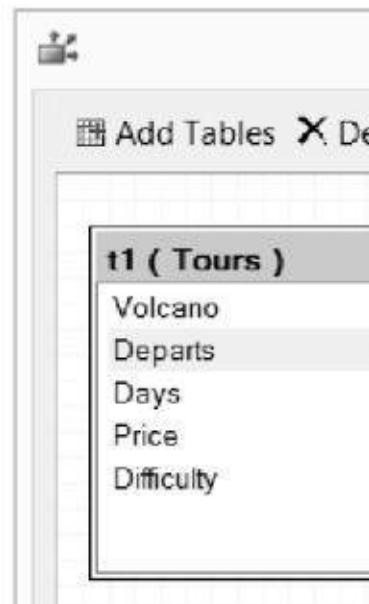


## 7.4 Setting the Properties

By default, when you join tables, SAS finds all rows in both tables. Sometimes that may be just what you want, but sometimes you want to limit the rows regardless of whether they are found in both tables. To do this, change the properties of the join.

**Reopening the Query window**  
If you have already run a query and closed the Query window, right-click the query node in the Process Flow and select **Modify Query** from the context menu. The Query Builder will open, showing the tables and joins used in the query.

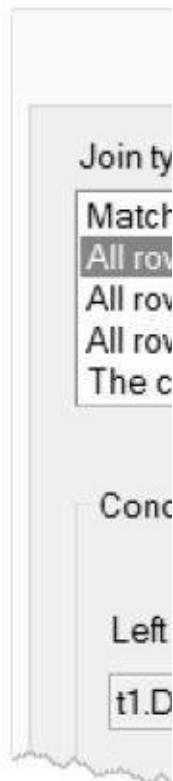
To modify a join, right-click the join indicator between the two tables and select **Properties** from the pop-up menu. The



The Join Properties window will open.

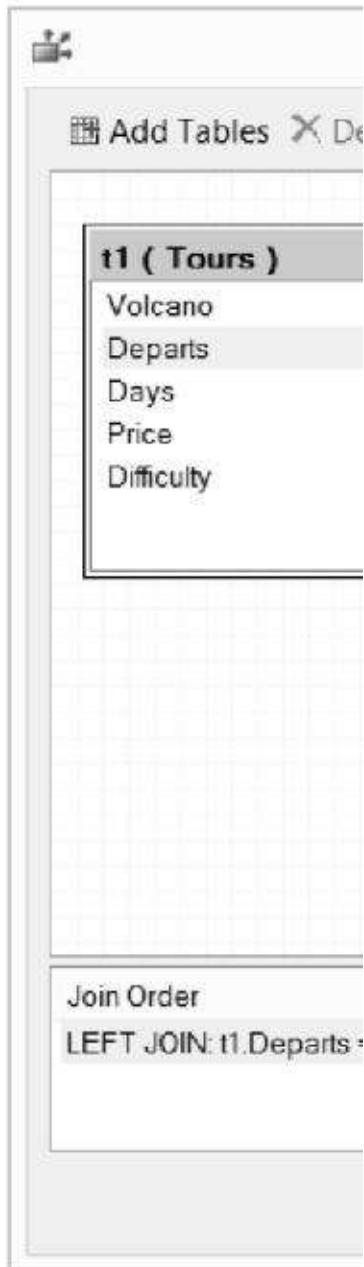


**Selecting the type of join** In the Join Properties window, you can choose from several types of joins. In this window, **All rows from the left table given a condition** has been selected. Tours is the table on the left, so all rows from Tours will be included regardless of whether there is a matching row in the Port\_Sea table. This is called a left





When you return to the Tables and Joins window, you will see that the join indicator between the two tables has changed. In this example, the circle on the left is filled in, indicating that all rows from the Tours data table will be included. When you are satisfied, click **Close**.



**Running the query** If you ha

**Running the query** If you run results, then drag those columns to satisfied, click **Run**. SAS Enterpris

**Results** This Data Grid shows the火山 (Volcano) and 离开 (Departs) for each trip, including the one for St. Helens. Note that the value for Days is missing for row 10. That is because the customer lives near St. Helens,

|    | Volcano     | Departs  | Days |    |
|----|-------------|----------|------|----|
| 1  | Etna        | Catania  | 7    | \$ |
| 2  | Etna        | Catania  | 7    | \$ |
| 3  | Kilauea     | Hilo     | 1    | \$ |
| 4  | Kilauea     | Hilo     | 1    | \$ |
| 5  | Krakatau    | Jakarta  | 7    | \$ |
| 6  | Kenya       | Nairobi  | 6    | \$ |
| 7  | Kilimanjaro | Nairobi  | 9    | \$ |
| 8  | Kenya       | Nairobi  | 6    | \$ |
| 9  | Kilimanjaro | Nairobi  | 9    | \$ |
| 10 | St. Helens  | Portland | 2    |    |
| 11 | Reventador  | Quito    | 4    |    |
| 12 | Vesuvius    | Rome     | 6    | \$ |
| 13 | Vesuvius    | Rome     | 6    | \$ |
| 14 | Poas        | San Jose | 1    |    |
| 15 | Poas        | San Jose | 1    |    |
| 16 | Fuji        | Tokyo    | 2    |    |
| 17 | Fuji        | Tokyo    | 2    |    |





8

“ The di  
new ideas  
from old c

From *The General Theory of Employment, Interest and Money*





# CHAPTER 8

## Working with Programs

- 8.1 Writing and Running SAS Programs
- 8.2 Creating Process Flowcharts
- 8.3 Viewing Program Flowcharts
- 8.4 Saving SAS Programs
- 8.5 Using Tasks to Generate Reports



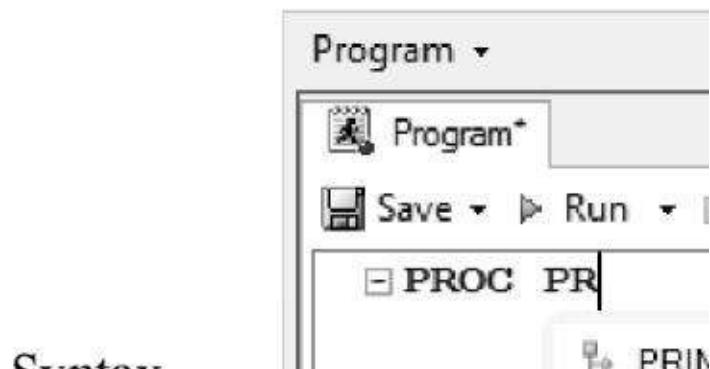


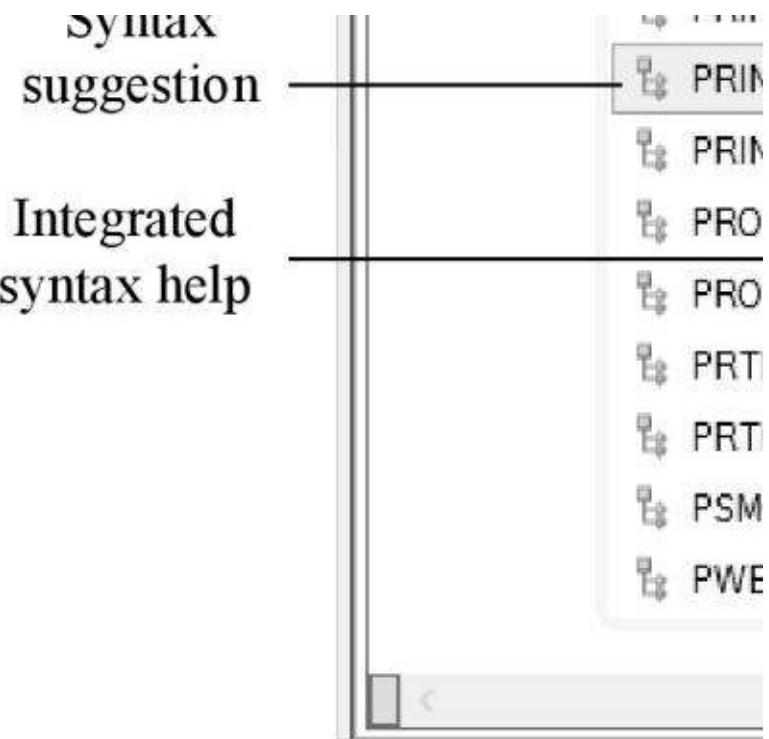
## 8.1 Writing and Running

In SAS Enterprise Guide, tasks write SAS programs. However, if you are making your work easier and more efficient, Enterprise Guide can help with that.

**Writing a new SAS program** Select **Program** from the menu bar. An empty program editor in SAS Enterprise Guide is displayed in blue, comments are gray.

**Syntax suggestion and autocomplete** Type appropriate keywords (called syntax) and use the autocomplete function, double-click the spacebar. If you do not need help,





**Integrated syntax help** If you move the cursor over a keyword in the editor, brief documentation for that keyword is displayed in the status bar. Documentation for keywords displayed in the editor is also available by clicking the **Help** menu item and selecting **Integrated syntax help**. In the screenshot, help is being displayed for PROC PRIN.

**Setting editor options** You can turn off syntax suggestion and integrated syntax help by selecting **Editor Options** from the menu bar (the **Tools** menu is shown).



## **Opening an existing SAS p**

to include in your project, you can bar. Navigate to your SAS program can edit the program.

## **Formatting code**

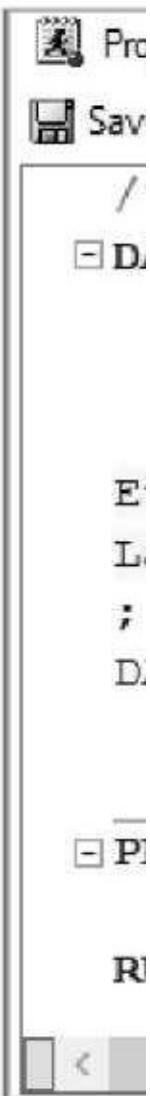
A program with proper indentation and line breaks is not just prettier, but easier to read and understand. If a program lacks formatting (perhaps you inherited it from the person who had your job before you), SAS Enterprise Guide can format it for you. To format a program, right-click your program and select **Format Code** from the pop-up menu. To



undo the formatting, select **Undo** from the same menu. The following example shows the program window, you can customize features for indenting.

## Running a program

When you are ready to run your program, click **Run** on the workspace toolbar for the Program window. Your program will run on the server that has been set as your default. To choose a different server, click **Selected Server**. To run a part of a program, highlight that part. Then click **Run** on the workspace toolbar above your program and select **Run Selection** from the pull-down menu. You can also use the Program menu on the main menu bar to run

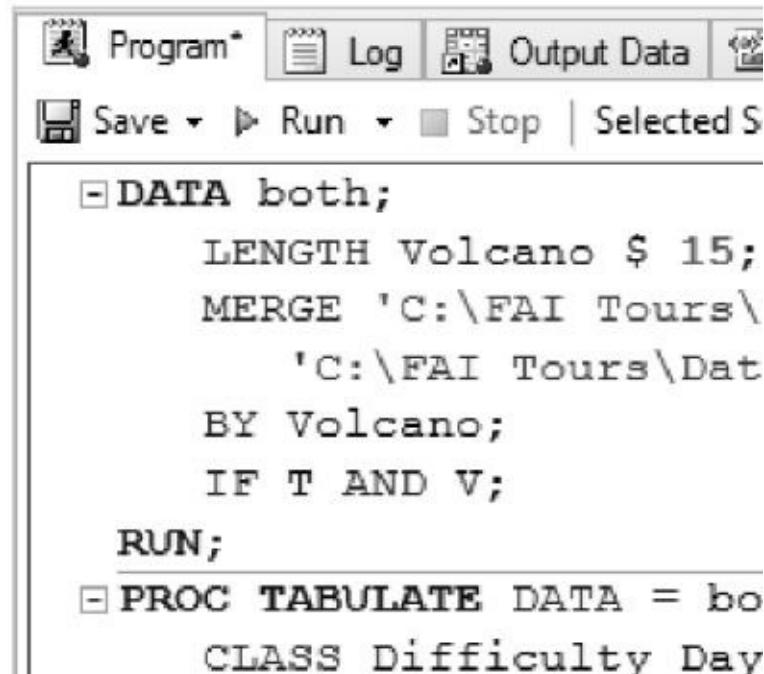




## 8.2 Creating Process Flow

Process flow diagrams make it easier to have SAS programs, then ordinary single programs can include many steps. Then you can use the Analyze Program Flow feature.

Here is a program that combines two steps. To analyze a program, click **Analyze** on the menu bar, then click **Analyze for Program Flow** from the list. The program will open.



The screenshot shows the SAS Enterprise Guide interface with the Program Editor window open. The window has tabs for Program\*, Log, Output Data, and Results. Below the tabs are buttons for Save, Run, Stop, and Selected. The main area displays a SAS program:

```
-DATA both;
  LENGTH Volcano $ 15;
  MERGE 'C:\FAI Tours\'
    'C:\FAI Tours\Dat
  BY Volcano;
  IF T AND V;
RUN;
-PROC TABULATE DATA = bo
  CLASS Difficulty Day
```

```
VAR Height Price;  
TABLE Difficulty, Da  
RUN;  
- PROC MEANS DATA = both;  
    VAR Days Price Heigh  
RUN;
```



### Analyze SAS Program

This will analyze your SAS program "Program" using workspace server.

Expand macros

Program step

Data sets

Name of process flow to create:

**Clo**

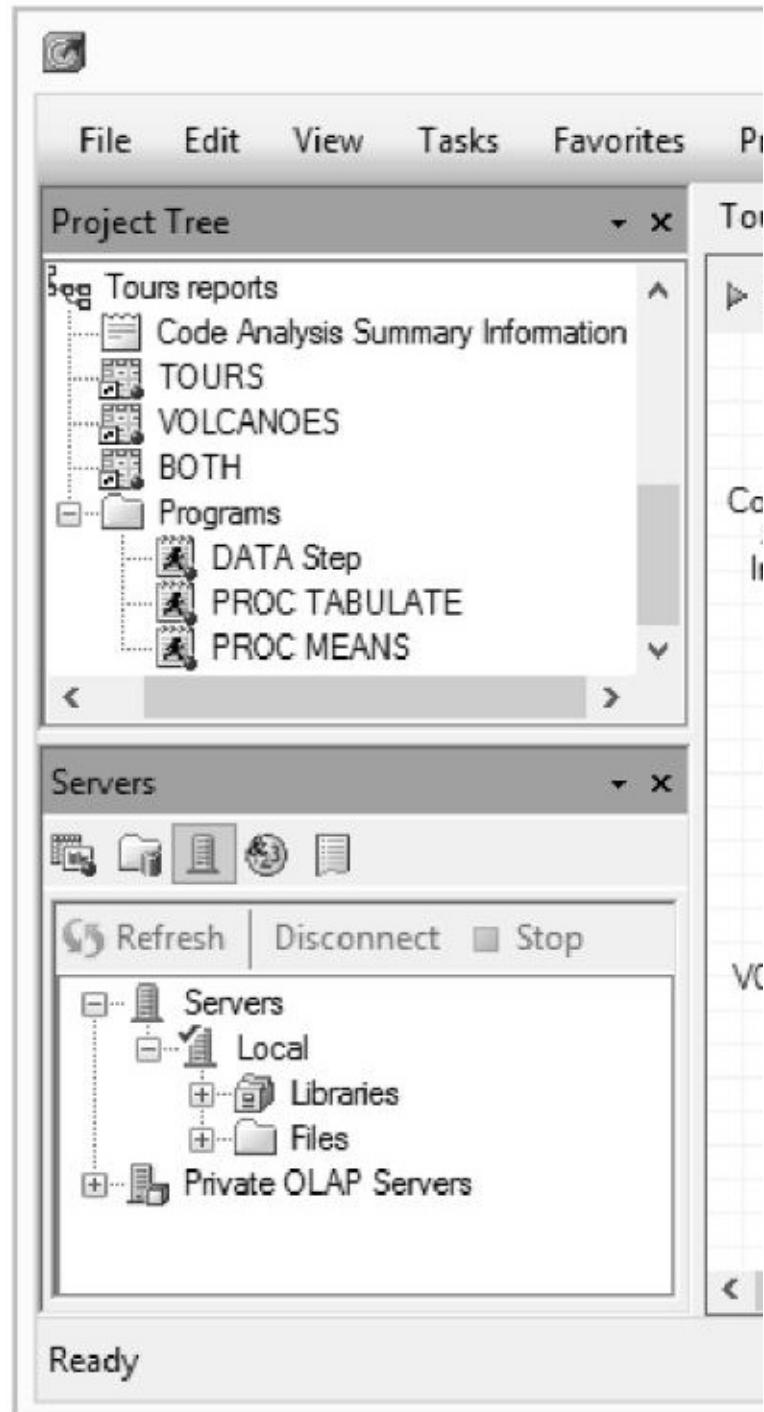
---

In the box labeled **Name of process to create**, you can type a name for process flow. Then click the **Create process flow** button near the bottom of the window.

In order to analyze your program, Enterprise Guide must run it. So the amount of time it takes will be similar to the time it normally takes to run your program. When SAS Enterprise Guide is done, the Analyze SAS Program window will automatically close, and your process flow will be displayed.

Here is SAS Enterprise Guide showing

displays the new items.





### 8.3

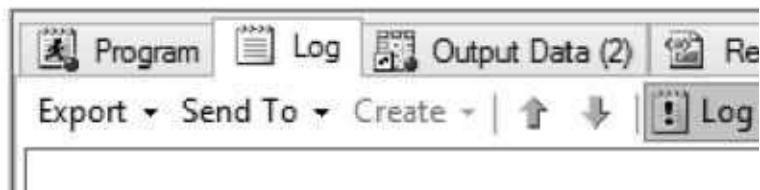
## Viewing Program and

A SAS log is a record of what SAS generates a SAS log. Logs contain warnings, or notes.

**Different types of logs** A program. Tasks generate logs too. task log because tasks rarely produce a new one.

The Project Log, on the other hand, is in a particular project. By default, nothing disappears from it unless

**Viewing a program log** After To open the program log, click the can use the Log Summary window above your log. The Log Summary



```
32      DATA NewTours;
33          UPDATE 'C:\FA
34          BY Volcano;|
```

```
NOTE: There were 10 observa
NOTE: There were 2 observat
NOTE: The data set WORK.NEW
NOTE: DATA statement used (
      real time            0
      cpu time             0
```

The screenshot shows the SAS Log Summary window. At the top, there are three buttons: 'Errors (0)', 'Warnings (0)', and 'Notes (9)'. The 'Notes' button is highlighted. Below the buttons, the word 'Description' is followed by a list of nine log entries, each preceded by an information icon (i). The entries are:

- NOTE: Writing TAGSETS.SASREPORT13(EGSR)
- NOTE: The data set WORK.NEWDATA has 2 obs
- NOTE: DATA statement used (Total process time):
- NOTE: There were 10 observations read from the d
- NOTE: The data set WORK.NEWTOURS has 10 obse

The Log Summary lists all the errors, warnings, and notes from the Log Summary, then SAS Enterprise Miner.

If your program contains any errors,

will include a red X . Programs

triangles . Even if there are no errors when you write your own SAS programs, the presence of warnings does not mean that it pro-



**Hiding wrapper code** One of the first things you notice when you run a process in SAS Enterprise Guide is that it contains more lines of SAS code than you wrote. This is because SAS Enterprise Guide adds housekeeping code to your process to make sure that it runs properly without errors. You can hide the wrapper code by clicking the Options button in the toolbar and uncheck **Show generated wrapper code**.

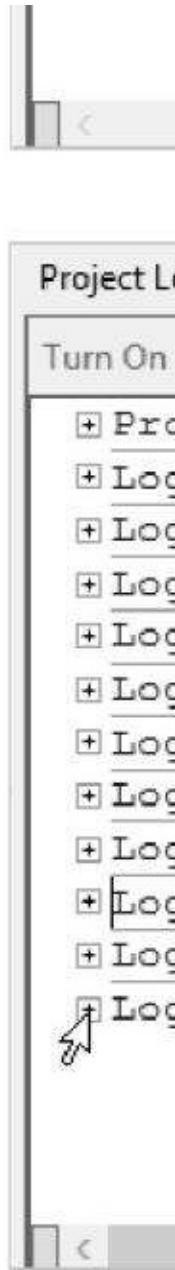
**Viewing the Project Log** To turn on the Project Log, first open it by clicking **Project Log** on the workspace toolbar for the Process Flow, or by selecting **View ► Project Log** from the menu bar. Then on the toolbar above the Project Log, click **Turn On**. Once the Project Log is turned on, it will



keep a continuous history of everything that runs in that project.

The Project Log includes the date and time when each action occurred. Click the plus sign (+) to expand a section of the log, or the minus sign (-) to collapse it.

To clear the Project Log, click **Clear Log** on the workspace toolbar above the Project Log. To turn it off, click **Turn Off**. Like the program log, the Project Log has a summary window that you can open by clicking **Log Summary** in



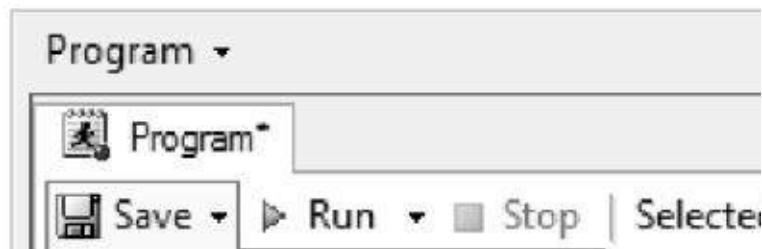


## 8.4 Saving SAS Programs

At first glance, saving a SAS program can seem like a simple task, but there is a decision to make. The basic decision is whether to save the program as a separate file. Programs that you save as separate files can be run outside a project. Programs that you save inside a project are embedded inside the project. If you save a program inside your project, then that program can be shared with other programs in the project.

**Saving a program inside the project**  
A program saved inside the project will be embedded inside the project. The program will be saved along with every other program in the project as a single file with the extension .egp.

To save your entire project, including all of the programs, click the **File** menu bar, or right-click the project name in the left pane, and select **Save project-name**.



The screenshot shows a SAS software interface. A pull-down menu is open at the top, with the 'Save Project' option highlighted. Below the menu, a code editor displays a SAS program. The program reads data from a file named 'volcano' and writes it to a new dataset 'NewTours'. It includes a PROC PRINT statement to output the updated data.

```
Save Project → Tou...
Save Program As...
INPUT volcano :$12
      Price Difficult;
      DATALINES;
      Etna . . 1225 .
      Lassen Sacramento 3 2!
      ;
      DATA NewTours;
      UPDATE 'C:\FAI Tou'
      BY Volcano;
      PROC PRINT DATA = NewTours;
      TITLE 'Updated Tou';
      RUN;
```

**Saving a program outside the project**  
To save a program outside the current project, click **Save** on the workspace toolbar, or click **File** from the pull-down menu, or right-click the project name in the left pane and select **Save program-name As** from the context menu.



You can also save a program from the Project Tree. To do this, right-click the program icon in the Project Tree or click the program icon in the Project Tree and then click Properties on the context menu. This opens the Properties for *program-name* window.

If you save the program in a file, then it is not embedded, and any changes you make to it in SAS Enterprise Guide will be saved in the file rather than as part of your project. The icon for a program saved in a file includes a little arrow indicating that the project



----  
contains a  
shortcut to the  
program rather  
than the actual

program .

Keep in mind  
that once a  
program is  
saved in a  
separate file, if  
that file is  
moved or deleted, then your proje



**Embedding a program in th**  
saved in a separate file, it is not au  
the program in your project, then

After you embed the program, any  
as part of your project rather than



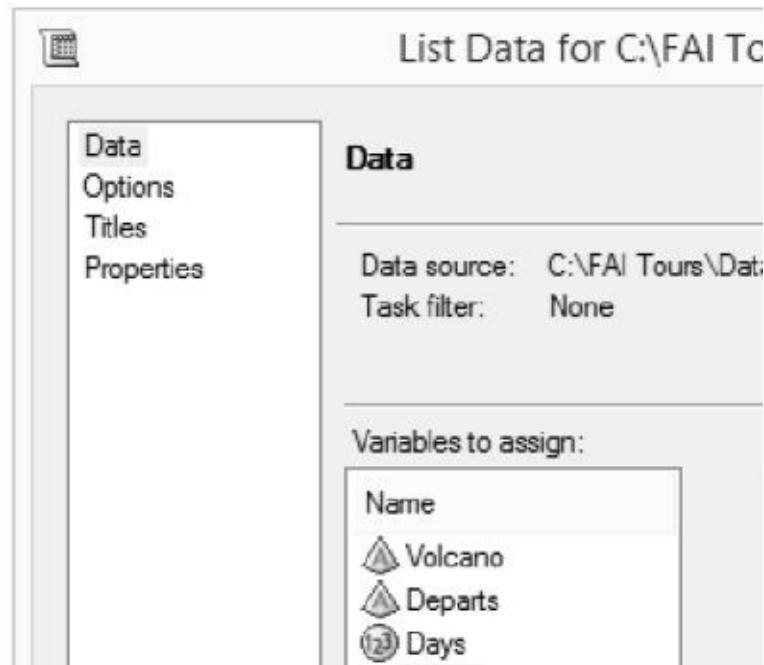
include the shortcut arrow . K  
the original file will still exist outs  
you will have two copies of your p  
made to the other.



## 8.5 Using Tasks to Generate SAS Code

If you are learning SAS programming, you can use the SAS Enterprise Guide. If you are a beginner, you can use the SAS Enterprise Guide to generate SAS code. You cannot edit the generated SAS code, but you can run it. You can also save it in a separate file, and you can save it in a separate file.

**Previewing code generated** by a task: Click the preview icon in the lower-left corner. If you click the preview icon, a new window will open, displaying the code that was generated. In the following screenshot, the preview icon shows Preview code being selected.



 Price  
 Difficulty



Enables you to preview the code to preview your task code, you can in

 Preview code

Show custom code insertion points

TITLE1 "Fire and Ice Tou  
FOOTNOTE;

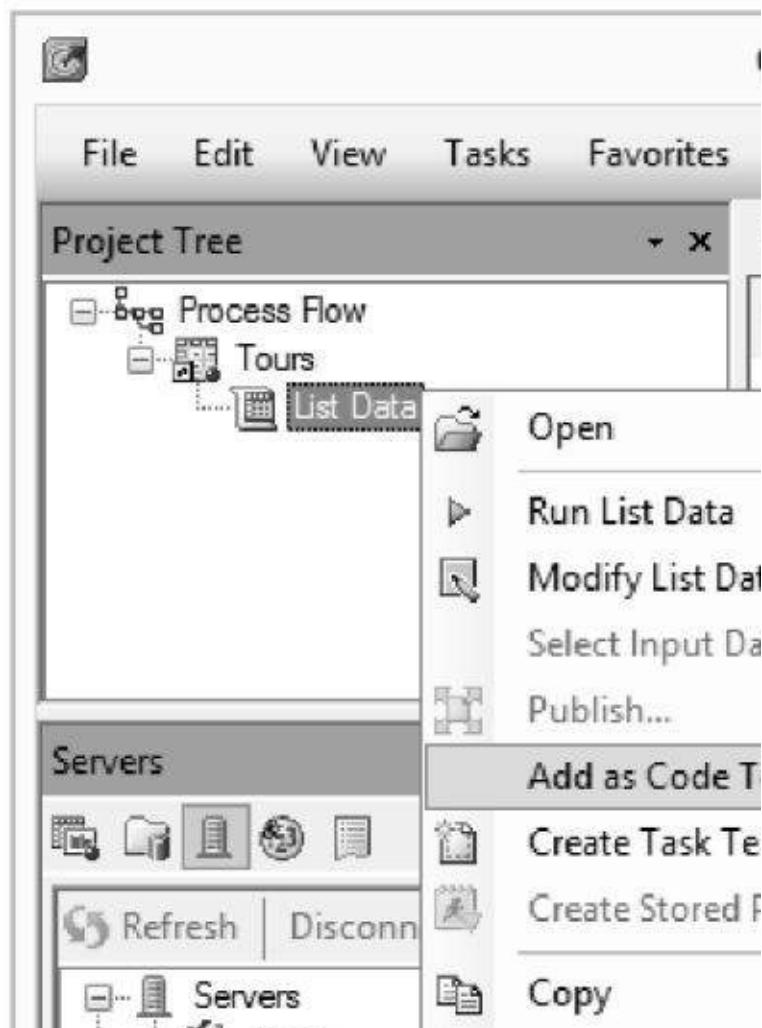
**PROC PRINT DATA=WORK.SOR**  
OBS="Tour Number"  
LABEL  
;  
VAR Volcano Difficul  
**RUN;**

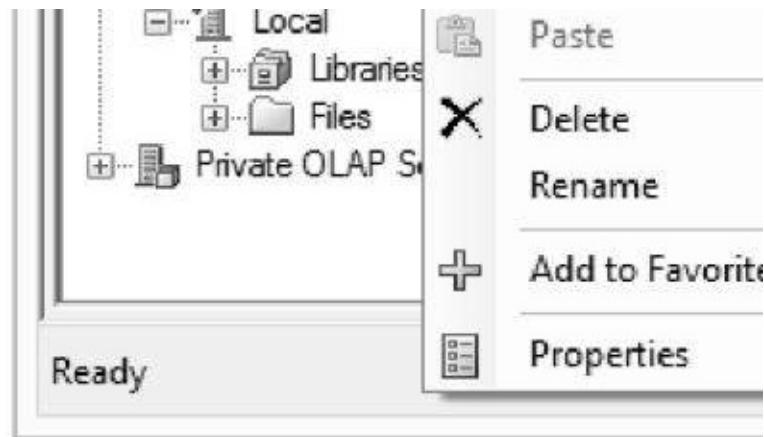
/\* -----  
End of task code





**Copying code generated by**  
(including from tasks that do not have a code generator) is simple. Right-click the item in the Project Tree or Process Flow, and then edit the copy. To do this, right-click the item in the Project Tree or Process Flow, and select A context menu will appear. Select the item you want to copy.

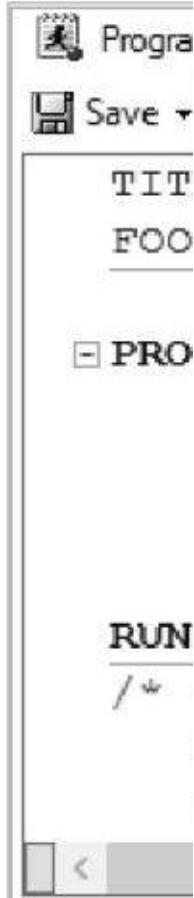




You can edit this code in any way the task, any changes you make here will cause the task be reflected in this code.

When you have made all the changes you want and are ready to run the program, click **Run** on the workspace toolbar above the Program window.

Programs created in this way are embedded in your project, and are not saved as separate files. For more information on saving programs, see the preceding section.













# APPENDIX A

## A Data Used in This Book

Tours Data 289

Tour Dates Data

Tour Bookings Data

Volcanoes Data 1

Eruptions Data 2

Latitude and Longitude

Portland Flights Data

Seattle Flights Data

## Advertising Resul





“ Begir  
the King s  
“and go o  
end: then

The King speaking with the Wl



## A ➤ Data Used in This Book

Reading about a topic is good, but do the examples in the tutorials or is to type the data shown in this ap Excel spreadsheet, or a text file. At

**[support.sas.com/authors](http://support.sas.com/authors)**

Select the name of one of the authors, click the picture of this book, click the word the instructions.

### Tours Data

Filename: Tours.sas7bdat  
File Type: SAS data set

| Column Name | Description         |
|-------------|---------------------|
| Volcano     | Name of the volcano |

|            |                     |
|------------|---------------------|
| Departs    | City from which     |
| Days       | Length of the tou   |
| Price      | Price of the tour i |
| Difficulty | Strenuousness of    |

## Tours.sas7bdat

|    |  Volcano |  Departs |  Day |
|----|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1  | Etna                                                                                      | Catania                                                                                     |                                                                                         |
| 2  | Fuji                                                                                      | Tokyo                                                                                       |                                                                                         |
| 3  | Kenya                                                                                     | Nairobi                                                                                     |                                                                                         |
| 4  | Kilauea                                                                                   | Hilo                                                                                        |                                                                                         |
| 5  | Kilimanjaro                                                                               | Nairobi                                                                                     |                                                                                         |
| 6  | Krakatau                                                                                  | Jakarta                                                                                     |                                                                                         |
| 7  | Poas                                                                                      | San Jose                                                                                    |                                                                                         |
| 8  | Reventador                                                                                | Quito                                                                                       |                                                                                         |
| 9  | St. Helens                                                                                | Portland                                                                                    |                                                                                         |
| 10 | Vesuvius                                                                                  | Rome                                                                                        |                                                                                         |



## Tour Dates Data

Filename: TourDates.sas7bdat

File Type: SAS data set

| <u>Column Name</u> | <u>Description</u>     |
|--------------------|------------------------|
| Tour               | Code for tour          |
| Volcano            | Name of the volcano    |
| DepartureDate      | Date of tour departure |
| Guide              | Name of guide for tour |

## TourDates.sas7bdat

|   | Tour | Volcano    |
|---|------|------------|
| 1 | PS27 | Poas       |
| 2 | SH40 | St. Helens |
| 3 | SH41 | St. Helens |
| 4 | SH42 | St. Helens |
| 5 | SH43 | St. Helens |
| 6 | FJ12 | Fuji       |
| 7 | ET01 | Etna       |
| 8 | KF05 | Kenya      |

| 9  | KL18 | Kilauea     |
|----|------|-------------|
| 10 | KL19 | Kilauea     |
| 11 | KL20 | Kilauea     |
| 12 | RD02 | Reventador  |
| 13 | VS11 | Vesuvius    |
| 14 | VS12 | Vesuvius    |
| 15 | KJ01 | Kilimanjaro |
| 16 | KK03 | Krakatau    |



## Tour Bookings Data

There are two versions of the book data set. They both contain the same information.

Filename: Bookings.xlsx  
File Type: Microsoft Excel spreadsheet

| <u>Column Name</u> | <u>Description</u>                |
|--------------------|-----------------------------------|
| Office             | Office where reservation was made |
| CustomerID         | Customer identification number    |
| Tour               | Code for tour                     |
| Travelers          | Number traveling                  |
| Deposit            | Amount of deposit                 |
| Deposit_Date       | Date of deposit                   |

### **Bookings.xlsx**



|    | A        | B          | C    |
|----|----------|------------|------|
| 1  | Office   | CustomerID | Tour |
| 2  | Portland | SL28       | SH43 |
| 3  | Portland | DE27       | PS27 |
| 4  | Portland | SL34       | FJ12 |
| 5  | Portland | DI33       | SH43 |
| 6  | Portland | BU12       | SH43 |
| 7  | Portland | DE31       | FJ12 |
| 8  | Portland | WI48       | FJ12 |
| 9  | Portland | NG17       | PS27 |
| 10 | Portland | RA28       | PS27 |
| 11 | Portland | ME11       | PS27 |
| 12 | Portland | GI08       | SH43 |
| 13 | Portland | HI15       | SH43 |
| 14 | Portland | MA09       | SH43 |
| 15 |          |            |      |
| 16 |          |            |      |

Sheet1 Sheet2 | S|

READY



**Bookings.sas7bdat**

|    | Office   | CustomerID |   |
|----|----------|------------|---|
| 1  | Portland | SL28       | S |
| 2  | Portland | DE27       | P |
| 3  | Portland | SL34       | F |
| 4  | Portland | DI33       | S |
| 5  | Portland | BU12       | S |
| 6  | Portland | DE31       | F |
| 7  | Portland | WI48       | F |
| 8  | Portland | NG17       | P |
| 9  | Portland | RA28       | P |
| 10 | Portland | ME11       | P |
| 11 | Portland | GI08       | S |
| 12 | Portland | HI15       | S |
| 13 | Portland | MA09       | S |





## **Volcanoes Data**

Filename: Volcanoes.sas7bdat

File Type: SAS data set

| <u>Column Name</u> | <u>Description</u>                   |
|--------------------|--------------------------------------|
| Volcano            | Name of the volcano                  |
| Country            | Country where the volcano is located |
| Region             | Region where the volcano is located  |
| Height             | Height of the volcano                |
| Activity           | Activity of the volcano              |
| Type               | Kind of volcano                      |





**Volcanoes.sas7bdat**

|    | ▲ Volcano     | ▲ Country   | ▲ R |
|----|---------------|-------------|-----|
| 1  | Altar         | Ecuador     | SA  |
| 2  | Arthur's Seat | UK          | Eu  |
| 3  | Barren Island | India       | As  |
| 4  | Elbrus        | Russia      | Eu  |
| 5  | Erebus        |             | An  |
| 6  | Etna          | Italy       | Eu  |
| 7  | Fuji          | Japan       | As  |
| 8  | Garibaldi     | Canada      | NA  |
| 9  | Grimsvotn     | Iceland     | Eu  |
| 10 | Illimani      | Bolivia     | SA  |
| 11 | Kenya         | Kenya       | Af  |
| 12 | Kilauea       | USA         | AP  |
| 13 | Kilimanjaro   | Tanzania    | Af  |
| 14 | Kliuchevskoi  | Russia      | As  |
| 15 | Krakatau      | Indonesia   | As  |
| 16 | Lassen        | USA         | NA  |
| 17 | Mauna Loa     | USA         | AP  |
| 18 | Nyamuragira   | DRCongo     | Af  |
| 19 | Nyiragongo    | DRCongo     | Af  |
| 20 | Pinatubo      | Philippines | As  |
| .. | ..            | ..          | ..  |

|    |              |            |    |
|----|--------------|------------|----|
| 21 | Poas         | Costa Rica | NA |
| 22 | Popocatepetl | Mexico     | NA |
| 23 | Puy de Dome  | France     | Eu |
| 24 | Reventador   | Ecuador    | SA |
| 25 | Ruapehu      | NZ         | AP |
| 26 | Sabancaya    | Peru       | SA |
| 27 | Santorini    | Greece     | Eu |
| 28 | Shishaldin   | USA        | NA |
| 29 | St. Helens   | USA        | NA |
| 30 | Vesuvius     | Italy      | Eu |
| 31 | Villarrica   | Chile      | SA |
| 32 | Warning      | Australia  | AP |



## Eruptions Data

There are two versions of the eruptions data.

They both contain the same columns:

Filename: Eruptions.csv

File Type: Text file with commas

| <u>Column Name</u> | <u>Description</u>         |
|--------------------|----------------------------|
| Volcano            | Name of the volcano        |
| StartDate          | Date the eruption started  |
| EndDate            | Date the eruption ended    |
| VEI                | Volcanic Explosivity Index |





## **Eruptions.csv**

| Volcano       | StartDate  | EndDate    |
|---------------|------------|------------|
| Barren Island | 12/20/1795 |            |
| Barren Island | 12/20/1994 |            |
| Erebus        | 12/12/1912 | . . . 2    |
| Erebus        | 01/03/1972 | . . . 1    |
| Etna          | 02/06/1610 | 08/15/1610 |
| Etna          | 06/04/1787 | 08/11/1787 |
| Etna          | 01/30/1865 | 06/28/1865 |
| Etna          | 12/16/2005 | 12/22/2005 |
| Fuji          | 12/16/1707 | 02/24/1707 |
| Grimsvotn     | 10/31/1603 | 11/01/1603 |
| Grimsvotn     | 01/08/1873 | 08/09/1873 |
| Grimsvotn     | 12/18/1998 | 12/20/1998 |
| Kilauea       | 05/30/1840 | 06/25/1840 |
| Kilauea       | 05/24/1969 | 07/22/1969 |
| Kliuchevskoi  | 09/25/1737 | 10/01/1737 |
| Kliuchevskoi  | 03/25/1931 | 04/01/1931 |
| Kliuchevskoi  | 01/20/2005 | 01/20/2005 |
| Krakatau      | 05/20/1883 | 10/21/1883 |
| Krakatau      | 07/04/1938 | 07/04/1938 |
| Krakatau      | 05/29/2000 | 10/30/2000 |
| Lassen        | 05/30/1914 | 06/29/1914 |
| Mauna Loa     | 06/20/1832 | 07/11/1832 |
| Mauna Loa     | 03/25/1984 | 04/11/1984 |

Nyamuragira, 11/07/1907, 12  
Nyamuragira, 02/06/2001, 04  
Nyiragongo, 06/21/1982, 10,  
Nyiragongo, 01/17/2002, 02,  
Pinatubo, 04/02/1991, 09/02  
Poas, 12/29/1898, 12/31/1900  
Poas, 04/08/1996, 04/08/1996  
Popocatepetl, 10/13/1663, 1  
Popocatepetl, 12/21/1994, 0  
Reventador, 12/12/1856, 12/  
Reventador, 02/24/1944, 03/  
Reventador, 11/03/2002, 01/  
Ruapehu, 02/13/1861, 05/16/  
Ruapehu, 06/17/1996, 09/01/  
Sabancaya, 05/01/1997, 05/01/  
Santorini, 09/27/1650, 12/01/  
Santorini, 05/23/1707, 09/10/  
Santorini, 01/26/1866, 10/10/  
Santorini, 01/10/1950, 02/01/  
Shishaldin, 03/13/1999, 05/  
St. Helens, 03/26/1847, 03/  
St. Helens, 03/27/1980, 10/  
St. Helens, 10/01/2004, 01/  
Vesuvius, 12/15/1631, 01/31/  
Vesuvius, 12/25/1732, 06/04/  
Vesuvius, 12/18/1875, 04/22/  
Vesuvius, 07/05/1913, 04/04/  
Villarrica, 11/07/1837, 11/  
Villarrica, 10/26/2008, . ,



## Eruptions.sas7bdat

|    | ⚠ Volcano     | 📅 StartDate | 🕒 EndDate | Duration     |
|----|---------------|-------------|-----------|--------------|
| 1  | Barren Island | 12/20/1795  |           | 12, 06:00:00 |
| 2  | Barren Island | 12/20/1994  |           | 06, 00:00:00 |
| 3  | Erebus        | 12/12/1912  |           |              |
| 4  | Erebus        | 01/03/1972  |           |              |
| 5  | Etna          | 02/06/1610  |           | 08, 00:00:00 |
| 6  | Etna          | 06/04/1787  |           | 08, 00:00:00 |
| 7  | Etna          | 01/30/1865  |           | 06, 00:00:00 |
| 8  | Etna          | 12/16/2005  |           | 12, 00:00:00 |
| 9  | Fuji          | 12/16/1707  |           | 02, 00:00:00 |
| 10 | Grimsvotn     | 10/31/1603  |           | 11, 00:00:00 |
| 11 | Grimsvotn     | 01/08/1873  |           | 08, 00:00:00 |
| 12 | Grimsvotn     | 12/18/1998  |           | 12, 00:00:00 |
| 13 | Kilauea       | 05/30/1840  |           | 06, 00:00:00 |
| 14 | Kilauea       | 05/24/1969  |           | 07, 00:00:00 |
| 15 | Kliuchevskoi  | 09/25/1737  |           | 11, 00:00:00 |
| 16 | Kliuchevskoi  | 03/25/1931  |           | 03, 00:00:00 |
| 17 | Kliuchevskoi  | 01/20/2005  |           | 04, 00:00:00 |
| 18 | Krakatau      | 05/20/1883  |           | 10, 00:00:00 |
| 19 | Krakatau      | 07/04/1938  |           | 07, 00:00:00 |
| 20 | Krakatau      | 05/29/2000  |           | 10, 00:00:00 |
| 21 | Lassen        | 05/30/1914  |           | 06, 00:00:00 |
| 22 | Mayon         | 06/20/1929  |           | 07, 00:00:00 |

| Rank | Volcano Name | Last Eruption Date | Year |
|------|--------------|--------------------|------|
| 23   | Mauna Loa    | 03/25/1984         | 04,  |
| 24   | Nyamuragira  | 11/07/1907         | 12,  |
| 25   | Nyamuragira  | 02/06/2001         | 04,  |
| 26   | Nyiragongo   | 06/21/1982         | 10,  |
| 27   | Nyiragongo   | 01/17/2002         | 02,  |
| 28   | Pinatubo     | 04/02/1991         | 09,  |
| 29   | Poas         | 12/29/1898         | 12,  |
| 30   | Poas         | 04/08/1996         | 04,  |
| 31   | Popocatepetl | 10/13/1663         | 10,  |
| 32   | Popocatepetl | 12/21/1994         | 08,  |
| 33   | Reventador   | 12/12/1856         | 12,  |
| 34   | Reventador   | 02/24/1944         | 03,  |
| 35   | Reventador   | 11/03/2002         | 01,  |
| 36   | Ruapehu      | 02/13/1861         | 05,  |
| 37   | Ruapehu      | 06/17/1996         | 09,  |
| 38   | Sabancaya    | 05/01/1997         | 05,  |
| 39   | Santorini    | 09/27/1650         | 12,  |
| 40   | Santorini    | 05/23/1707         | 09,  |
| 41   | Santorini    | 01/26/1866         | 10,  |
| 42   | Santorini    | 01/10/1950         | 02,  |
| 43   | Shishaldin   | 03/13/1999         | 05,  |
| 44   | St. Helens   | 03/26/1847         | 03,  |
| 45   | St. Helens   | 03/27/1980         | 10,  |
| 46   | St. Helens   | 10/01/2004         | 01,  |
| 47   | Vesuvius     | 12/15/1631         | 01,  |
| 48   | Vesuvius     | 12/25/1732         | 06,  |
| 49   | Vesuvius     | 12/18/1875         | 04,  |
| 50   | Vesuvius     | 07/05/1913         | 04,  |
| 51   | Villarrica   | 11/07/1837         | 11,  |
| 52   | Villarrica   | 10/26/2008         |      |



## **Latitude and Longitude Data**

There are two versions of the latitude and longitude data. They both contain the following information:

Filename: Latlong.txt  
 File Type: Fixed-width text file

| <u>Column Name</u> | <u>Description</u>  |
|--------------------|---------------------|
| Volcano            | Name of the volcano |
| Latitude           | Latitude            |
| Longitude          | Longitude           |

### **Latlong.txt**

|               |          |           |
|---------------|----------|-----------|
| Volcano       | Latitude | Longitude |
| Altar         | -1.67    | -78.5     |
| Barren Island | 12.28    | 93.0      |
| Elbrus        | 43.33    | 42.0      |
| Erebus        | -77.53   | 167.0     |
| Etna          | 37.73    | 15.0      |
| Fuji          | 35.35    | 138.0     |
| Garibaldi     | 49.85    | -123.0    |
| Grimsvotn     | 64.42    | -17.0     |

|              |        |      |
|--------------|--------|------|
| Illimani     | -16.39 | -67  |
| Kenya        | -0.09  | 37   |
| Kilauea      | 19.43  | -155 |
| Kilimanjaro  | -3.07  | 37   |
| Kliuchevskoi | 56.06  | 160  |
| Krakatau     | -6.10  | 105  |
| Lassen       | 40.49  | -121 |
| Mauna Loa    | 19.48  | -155 |
| Nyamuragira  | -1.41  | 29   |
| Nyiragongo   | -1.52  | 29   |
| Pinatubo     | 15.13  | 120  |
| Poas         | 10.20  | -84  |
| Popocatepetl | 19.02  | -98  |
| Puy de Dome  | 45.50  | 2    |
| Reventador   | -0.08  | -77  |
| Ruapehu      | -39.28 | 175  |
| Sabancaya    | -15.78 | -71  |
| Santorini    | 36.40  | 25   |
| Shishaldin   | 54.76  | -163 |
| St. Helens   | 46.20  | -122 |
| Vesuvius     | 40.82  | 14   |
| Villarrica   | -39.42 | -71  |



## Latlong.sas7bdat

|    | Volcano       | Latitude |
|----|---------------|----------|
| 1  | Altar         | -1       |
| 2  | Barren Island | 12       |
| 3  | Elbrus        | 43       |
| 4  | Erebus        | -77      |
| 5  | Etna          | 37       |
| 6  | Fuji          | 35       |
| 7  | Garibaldi     | 49       |
| 8  | Grimsvotn     | 64       |
| 9  | Illimani      | -16      |
| 10 | Kenya         | -0       |
| 11 | Kilauea       | 19       |
| 12 | Kilimanjaro   | -3       |
| 13 | Kliuchevskoi  | 56       |
| 14 | Krakatau      | -        |
| 15 | Lassen        | 40       |
| 16 | Mauna Loa     | 19       |
| 17 | Nyamuragira   | -1       |
| 18 | Nyiragongo    | -1       |

|    |              |     |
|----|--------------|-----|
| 19 | Pinatubo     | 15  |
| 20 | Poas         | 1   |
| 21 | Popocatepetl | 19  |
| 22 | Puy de Dome  | 4   |
| 23 | Reventador   | -0  |
| 24 | Ruapehu      | -39 |
| 25 | Sabancaya    | -15 |
| 26 | Santorini    | 3   |
| 27 | Shishaldin   | 54  |
| 28 | St. Helens   | 4   |
| 29 | Vesuvius     | 40  |
| 30 | Villarrica   | -39 |



## Portland Flights Data

Filename: Portland.sas7bdat

File Type: SAS data set

| <u>Column Name</u> | <u>Description</u>   |
|--------------------|----------------------|
| Origin             | City from which      |
| Destination        | City in which flight |
| FlightNo           | Flight number        |
| FlightPrice        | Price of flight in   |

### Portland.sas7bdat

|   | Origin   | Destination |
|---|----------|-------------|
| 1 | Portland | Catania     |
| 2 | Portland | Hilo        |
| 3 | Portland | Nairobi     |
| 4 | Portland | Rome        |
| 5 | Portland | San Jose    |
| 6 | Portland | Tokyo       |

## **Seattle Flights Data**

Filename: Seattle.sas7bdat  
File Type: SAS data set

| <u>Column Name</u> | <u>Description</u> |
|--------------------|--------------------|
| Origin             | City from which    |
| Destination        | City in which fli  |
| FlightNo           | Flight number      |
| FlightPrice        | Price of flight in |

### **Seattle.sas7bdat**

|   | Origin  | Destination |
|---|---------|-------------|
| 1 | Seattle | Catania     |
| 2 | Seattle | Hilo        |
| 3 | Seattle | Jakarta     |
| 4 | Seattle | Nairobi     |
| 5 | Seattle | Quito       |
| 6 | Seattle | Rome        |
| 7 | Seattle | San Jose    |
| 8 | Seattle | Tokyo       |



## **Advertising Results Data**

Filename: AdResults.sas7bdat

File Type: SAS data set

| <u>Column Name</u> | <u>Description</u>     |
|--------------------|------------------------|
| City               | City                   |
| Month              | Month                  |
| AdDollars          | Money spent on ad      |
| Bookings           | Number of tours booked |

## **AdResults.sas7bdat**

|   | City    | Month | A |
|---|---------|-------|---|
| 1 | Seattle | 1     |   |
| 2 | Seattle | 2     |   |
| 3 | Seattle | 3     |   |
| 4 | Seattle | 4     |   |
| 5 | Seattle | 5     |   |
| 6 | Seattle | 6     |   |
| 7 | Seattle | 7     |   |
| 8 | Seattle | 8     |   |

| o  | Seattle  | o  |
|----|----------|----|
| 9  | Seattle  | 9  |
| 10 | Seattle  | 10 |
| 11 | Seattle  | 11 |
| 12 | Seattle  | 12 |
| 13 | Portland | 1  |
| 14 | Portland | 2  |
| 15 | Portland | 3  |
| 16 | Portland | 4  |
| 17 | Portland | 5  |
| 18 | Portland | 6  |
| 19 | Portland | 7  |
| 20 | Portland | 8  |
| 21 | Portland | 9  |
| 22 | Portland | 10 |
| 23 | Portland | 11 |
| 24 | Portland | 12 |









# **Index**

## **A**

Access files 163  
active data table 186  
adding process flows 144  
addition in expressions 172-1  
advanced expression 85-91, 1  
advanced filters 262-263  
aliases, data tables 87  
ALL universal class variable  
Analyze SAS Program tool 2  
AND logic in filters 107, 260-  
ANOVA procedure (One-Way  
task) 184  
Append Table task 268-269  
appending  
  data tables 266, 268-269

rows in Data Grid 171  
arguments in functions 234-2  
arranging items in process flows 109  
ascending sort order 109, 253  
ASCII  
    data files 162  
    sort order 255  
Assign Project Library wizard 276  
Auto Arrange option for process flows 144  
Auto Hide 138  
autocompletion 276  
Autoexec process flow 147

## B

Background Color option for process flows 144  
BESTw. format 156-157  
box area in Summary Tables 147

## C

CATS function 236-237  
character data  
    definition 12, 150-151  
    formats 156-157  
    functions 236-237



## **304** *Index*

computing columns  
in Data Grid 172-173  
in query 84-92, 232-235, 238-243  
concatenating data tables 266, 268-269  
conditional selection of rows 98-108, 250-  
253, 258-263  
contents of data tables 152-153  
copying  
    data tables 170  
    items in process flows 145  
CORR procedure (Correlations task) 184  
COUNT statistic in query 238-243  
counts in Summary Tables 214-215  
Create Format task 59-64, 194-197  
cross-tabulations in Summary Tables 214-  
215  
CSV files  
    exporting 180-181  
    reading 162, 176-177  
currency data  
    definition 13, 150  
    formats 156-157

## **D**

data engines, SAS 167  
Data Exploration History window 139  
data files  
    exporting 180-181  
    reading 162-165, 174-179  
    types 162-163  
Data Grid  
    appending rows 171  
    computing columns 172-173  
    creating 5-21, 168-169  
    definition 150  
    deleting columns 16, 171  
    deleting rows 20, 171  
    editing 19, 168-171  
    inserting columns 170-173  
    inserting rows 171  
Data page in task 186-187  
data sets, definition 6, 150  
data tables  
    active 186  
    aliases 87  
    appending 266, 268-269  
    compared to data sets 6  
    copying 170  
    creating summary 202-203  
    creating with a query 246-247  
    definition 6, 150  
    editing 19, 154, 168-171



descriptive statistics  
in query 238-243  
in Summary Statistics 202-  
in Summary Tables 216-21  
display formats  
    applying standard 155  
    applying user-defined 65-6  
    creating user-defined 59-6  
    grouping with 200-201  
    in Data Grid 170-171  
    in query 230-231, 243  
    in tasks 53-58, 192-193  
    names 60  
    new data table 169  
    table of 156-157  
division in expressions 172-1  
docked windows 138  
documenting  
    data tables 150-153  
    projects 34-35, 158-159  
DOLLARw.d format 156-157  
DTDATEw. format 156-157  
duplicate rows, deleting 255

## E

- EBCDIC sort order 255
- Edit button in task window 2
- editing
  - data tables 19, 154, 168-171
  - SAS programs 276-277, 284
  - styles 208-209
- EGTASK library 7, 164
- embedding program in project
- engines, SAS data 167
- entering data 19, 168-171
- errors 280
- EURDFDDw. format 156-157
- EUROXw.d format 156-157
- Ew. format 156-157
- Excel files 163
  - exporting 180-181
  - importing 174-175
- Excel results 71-72, 204-205
  - styles for 206-207
- Export wizard 180-181
  - exporting
    - data 180-181
    - items from project 141
    - results 210-211



## **306** *Index*

### **G**

G3D procedure (Scatter Plot task) 184  
GCHART procedure (Bar Chart task) 184  
GPLOT procedure  
    (Line Plot task) 184  
    (Scatter Plot task) 28-32, 184  
graphs  
    scatter plots 28-32  
    tasks 184  
Grid option for process flows 144  
group column property 13  
grouping data  
    in query 238-243  
    recoding values 244-245  
    summary reports 214-217  
    with user-defined formats 200-201  
grouping reports 188-189

### **H**

headings  
    changing in tasks 53-58  
    in Summary Tables 218-221  
help

program syntax 276  
SAS Technical Support x  
hiding windows 138  
HTML data files 163  
HTML results 71-72, 204-205  
styles for 206-209

## I

images, adding to style 209  
Import Data wizard 174-179  
importing data 165  
    delimited raw data 176-177  
    Excel files 174-175  
    fixed columns raw data 178-179  
    JMP files 163  
    SPSS files 163  
    Stata files 163  
    types of data 162-163  
informats 154-155  
    new data table 168-169  
inner join 130-131, 267, 272-273  
inserting  
    columns in Data Grid 170-173  
    rows in Data Grid 171



merging data tables 117-122,  
267, 270-273

## MIN

function 236-237  
in query 238-243  
in Summary Tables 216-21  
missing data values 18, 151  
number of 216-217, 238-241

MMDDYYw. format 156-157

modifying

joins 128-133, 272-273  
tasks 25-26, 48, 189

MONTH function 236-237

moving items in process flow

multiplication in expressions  
232-233

My Styles, creating 208-209

## N

N statistic

in query (COUNT) 238-243  
in Summary Tables 214-21

names

—1— 0 0 1 E 1 1 E 4 1 E 5 1

column 8-9, 151, 154-155, 179  
data tables 6-7, 151, 168  
format 60  
library 166  
New Computed Column wiz 232-235, 244-245  
New Data wizard 5-17, 168-1  
New Filter wizard 99-106, 12263  
NMISS statistic  
in query 238-243  
in Summary Tables 216-21  
notes 34-35, 141, 158-159  
numeric data  
definition 12, 150-151  
formats 156-157  
groups 13, 150-151  
labels for 196-197  
user-defined formats 196-1

## O

observations, definition 150  
ODBC 163  
one-to-many merge 266  
one-to-one merge 266  
One-Way Frequencies task (F procedure) 22-28, 200-20



## **308** *Index*

procedures  
finding 184  
FORMAT (Create Format task) 59-64,  
194-197  
FREQ (One-Way Frequencies task) 22-  
28, 200-201  
GPLOT (Scatter Plot task) 28-32  
MEANS (Summary Statistics task) 202-  
203  
PRINT (List Data task) 45-58, 65-67,  
186-191  
SORT (Sort Data task) 254-255  
SQL (Append Table task) 268-269  
SQL (Query Builder) 228-247, 256-263,  
266-267, 270-273  
SUMMARY (Summary Statistics task)  
202-203  
TABULATE (Summary Tables task)  
214-225  
process flows 4, 32-33, 138-141, 144-145  
adding links 148-149  
Autoexec 147  
create from SAS code 278-279  
deleting links 148-149

- running 146-147
- programs, SAS ix
  - editing 276-277
  - embedding in project 282-283
  - formatting 276-277
  - from task 284-285
  - item in project 141
  - log 280
  - process flow from 278-279
  - properties 282-283
  - running 276-277
  - saving 282-283
- Project Log 280-281
- Project Tree 4, 33, 138, 140-141
- projects
  - definition 3, 140-141
  - documenting 34-35, 158-159
  - opening 3, 140
  - running 146
  - saving 36-37, 141
- Prompt Manager window 139
- properties
  - of columns 8-17, 93-95, 152-155, 168-169, 192-193, 198-201, 231, 243
  - of data tables 152-153
  - of items in project 141
  - of joins 129-131, 272-273
  - of SAS programs 282-283
  - of tasks 69-71 205

THE WOODS 100 FT, 200

## reports

- creating with a query 246-*i*
- footnotes 190-191
- frequency 22-28
- grouping with formats 200
- list 45-58, 186-187
- summary tables 214-225
- titles 190-191
- resetting options 4
- Resources pane 4-5, 138-139,
- restoring windows 139
- results
  - footnotes 190-191
  - format 71-73, 204-205
  - in process flow 141
  - queries 83, 228-229, 246-24
  - saving 210-211
  - style of 69-71, 206-209
  - titles 190-191
  - viewing 142-143
- right join 130-131, 267, 272-273
- row number in list reports 53
- rows
  - appending in Data Grid 17

definition 150  
deleting duplicates 255  
deleting from Data Grid 20  
grouping in a report 188-191  
inserting in Data Grid 171  
selecting 98-108, 123-128, 259, 262-263

## RTF

results 71-72, 204-205  
styles for 206-207

running  
automatically 147  
process flows 146-147  
projects 146  
SAS programs 276-277  
tasks 147, 187, 189

## S

SAS data engines 167  
SAS data sets, definition 150  
SAS Folders window 139  
SAS listing (text) output 204-205  
SAS log, viewing 280-281  
SAS programs  
editing 276-277  
embedding in project 282-283  
formatting 276-277  
from task 284-285



## **310** *Index*

statistics  
    descriptive 202-203, 216-217, 238-243  
    functions 236-237  
    saving to a data table 202-203  
Style Manager 208-209  
styles  
    changing 69-71, 206-207  
    creating new 208-209  
subsetting data tables 98-108, 123-128,  
    250-253, 258-263  
SUBSTR function 236-237  
subtraction in expressions 172-173, 232-  
    233  
summarized columns  
    groups 238-243  
    in query 85, 238-241  
Summary Statistics task (SUMMARY  
    procedure) 202-203  
Summary Tables task 214-225  
    box area properties 219  
    class level properties 220-221  
    data value properties 224-225  
    heading properties 218-219  
    table properties 222-223

sums  
function 236-237  
in query 238-243  
in Summary Tables 216-217  
syntax suggestion 276

## T

tab-delimited files  
exporting 180-181  
reading 162, 176-177  
TABULATE procedure (Summary Tables task) 184, 214-225  
task roles, assigning 24, 186  
Task Status window 5, 139  
tasks  
Append Table 268-269  
applying formats 192-193  
Assign Project Library 166-167  
assigning formats 53-58  
code generated by 284-285  
compared to wizards 22  
Create Format 59-64, 194-197  
data for 250-251  
Filter and Sort 252-253  
filtering in 250-251  
footnotes 48-52, 190-191  
in process flow 140  
List Data 45-58, 65-67, 186-187, 190-191



# W

- w.d format 156-157
- warnings 280
- WEEKDATEw. format 156-1
- WEEKDAY function 236-237
- windows 4-5, 138-139
  - hiding 138
  - maximizing workspace 14
  - Note 158-159
  - Process Flow 4, 32-33, 138-
  - Project Tree 4, 33, 138, 140-
  - Resources pane 138-139, 16
  - restore window layout 139
  - splitting workspace 142-14
  - Tasks 184-185
- wizards
  - Assign Project Library 166
  - compared to tasks 22, 185
  - Export 180-181, 210-211
  - Import Data 174-179
  - New Computed Column 8  
235, 244-245

**new Data** 5-17, 100-102  
    New Filter 99-106, 124-126  
**WORDDATEw.** format 156-1  
**WORK** library 7, 164  
workspace 4, 138-139, 142-14  
    toolbar 25  
Workspace Layout icon 142  
wrapper code  
    hiding 281  
    viewing 284

## Z

Zoom option for process flow

## Special Characters

\$UPCASEw. format 156-157  
\$w. format 156-157  
\_FREQ\_ variable 203  
\_TYPE\_ variable 203  
\_WAY\_ variable 203



## **312** *Index*







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