



**TEXAS TECH
UNIVERSITY**

SAS Enterprise Guide- PART II

SHORTCOURSE HANDOUT



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SAS Enterprise Guide 7.1 – Part II

ShortCourse Handout

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Introduction

SAS Enterprise Guide provides a **point-and-click** interface to the power of **SAS**. The point and click environment helps you to import the data, analyze the data, and produce output.

In this ShortCourse, you'll learn how to use SAS Enterprise Guide to create **Graphs**, **Reports** and **Queries**.

Depending on your exact needs, there are several tasks that can create a report such as **List Report**, **List Data**, **Summary Tables**, and **Summary Statistics**.

The Enterprise Guide's **Query Builder** enables you to extract data from one or more tables according to criteria that you specify.

In this ShortCourse, it is assumed that you have completed at least the **SAS- Part I** ShortCourse and **SAS Enterprise Guide- Part I** or already know how to create SAS data sets. This ShortCourse also assumes a familiarity with Elementary Statistics and Microsoft Access Queries.

Course Objectives

After completing this ShortCourse, you should be able to:

- Create and save projects;
- Create and Modify a List Report;
- Use the Query Builder, to create Queries;
- Join Tables by Using a Query ;
- Create a Computed Column by using Expression Builder;

- Create Summary Statistics;
- Create Summary Tables;
- Filter your SAS data set;
- Create a Bar Chart ;
- Create a Pie Chart; and
- Combine the HTML results from multiple tasks in your project into a single document.

Starting a new Project


- From the **Start** menu choose **Programs**
- Select **SAS** -> Click on **Enterprise Guide 7.1**
- In the **Welcome to SAS Enterprise Guide** window, click **New Project**

Setting Results formats

- **Tools -> Options**
- On the **Results** tab
 - **HTML (Associated Viewer: Internet Explorer)**
 - On the **HTML** tab, select a **Style:**
 - **PDF (Associated Viewer: Adobe Acrobat)**
 - On the **PDF** tab, select a **Style:**
 - **RTF (Associated Viewer: Microsoft Word)**
 - On the **RTF** tab, select a **Style:**
 - File header
 - Author
 - Title
 - **Text Output** - generates results in text format.
 - **Results -> Viewer -> Check the Associated Viewer: Internet Explorer** (to be able to view the HTML output)
- On the **Tasks** tab
 - Click the **Tasks General**, and then delete the "default footnote text for task output:" text.
 - Click the **Output Library** tab, and select a library for output data (**EGTask** is the default output library).

- You can add a new library to the search list by clicking **Add** and typing the name of the library.
- You can remove a library by selecting the library that you want to remove and clicking **Remove**.
- You can change the order of the search list by selecting the library that you want to move and clicking **Up** or **Down**. And then **Apply**.
- Click **OK**.

To Save a Project to a local computer

- Select **File -> Save Project As ...**, or click  on the toolbar.
- To change the name or location of an existing project, select **File -> Save project-name As**.
 - In the Save window, click Local Computer, or select Local Computer from the Save in drop-down list.
 - Select a location for the project.
 - Enter the name of the project in the **File Name** box and click **Save**.

Exercise #1: Adding SAS Data sets to your project

Before you can create reports or run analyses, you must add data to your project.

- Select **File -> Open -> Data...**
- Find and open **Data** folder in the **SAS Enterprise Guide 7.1 Sample** directory.
- Press **CTRL** and select **Orders, PRDSALE, Products** data sets, and then click **Open**.
- **Close** any open data set.
- In the **Process Flow** window, right-click the **Products** data set, and select **Properties** from the pop-up menu. The Properties for Products window opens. You can see information about general properties such as the physical location of the data and the date it was last modified.
- In the selection pane, click **Columns**, to view the columns properties (Name, Type, Length, Format, Informat, and Label) for the data item.
- Click **Cancel** to close the properties window.



Orders



prdsale



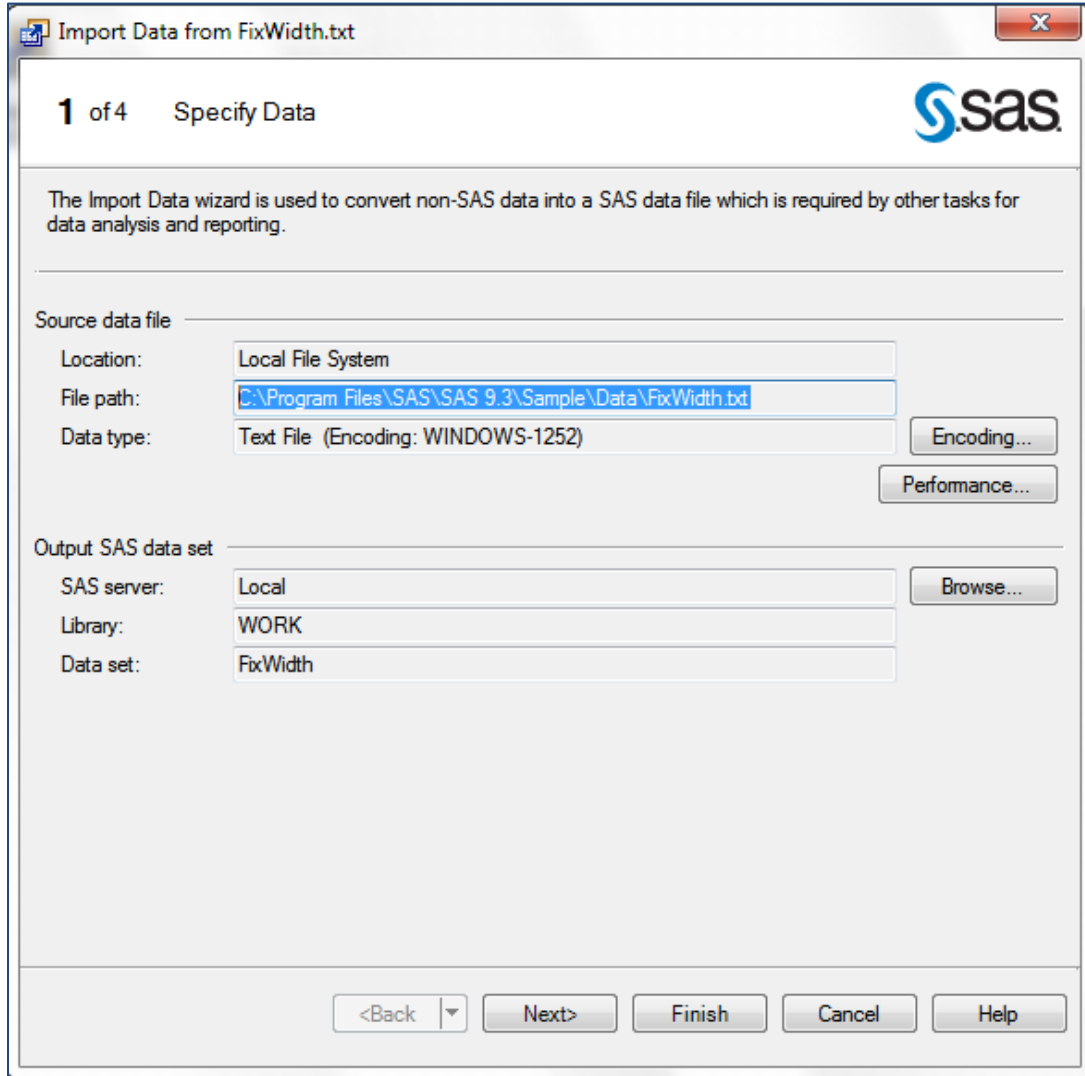
Products

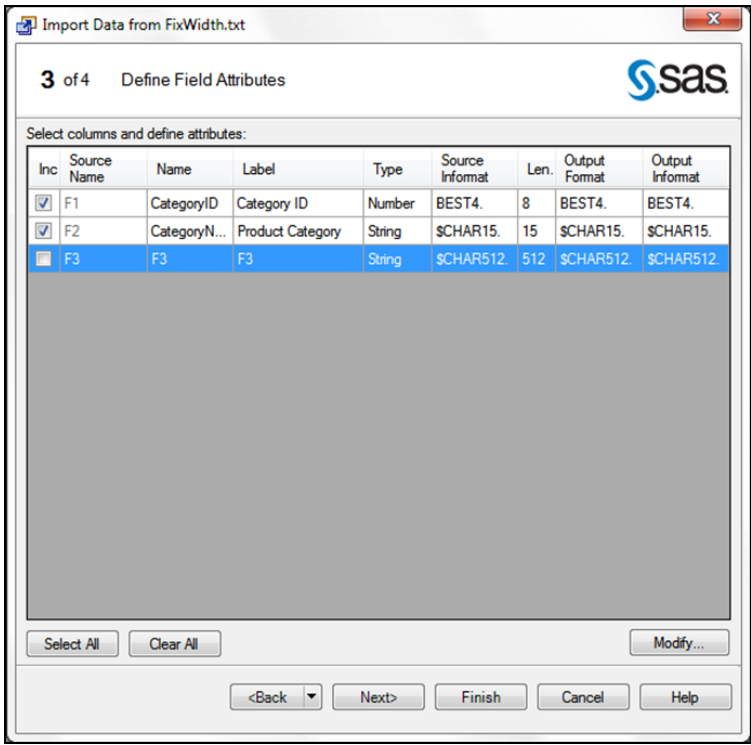
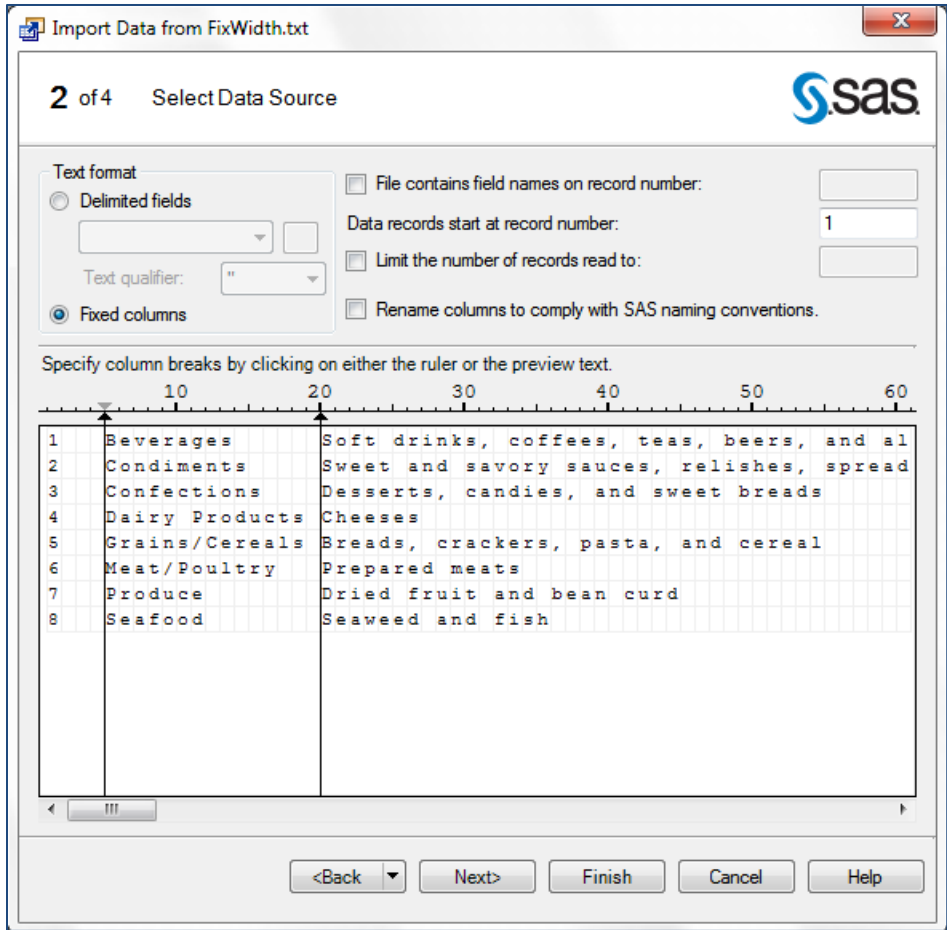
Columns					
Name	Type	Length	Format	Informat	Label
ProductID	Numeric	8	11.	11.	ProductID
ProductName	Character	40	\$40.	\$40.	ProductName
SupplierID	Numeric	8	11.	11.	SupplierID
CategoryID	Numeric	8	11.	11.	CategoryID
QuantityPerUnit	Character	20	\$20.	\$20.	QuantityPerUnit
UnitPrice	Currency	8	DOLLAR25.2	DOLLAR25.2	UnitPrice
UnitsInStock	Numeric	8	6.	6.	UnitsInStock
UnitsOnOrder	Numeric	8	6.	6.	UnitsOnOrder
ReorderLevel	Numeric	8	6.	6.	ReorderLevel
Discontinued	Numeric	8	1.	1.	Discontinued

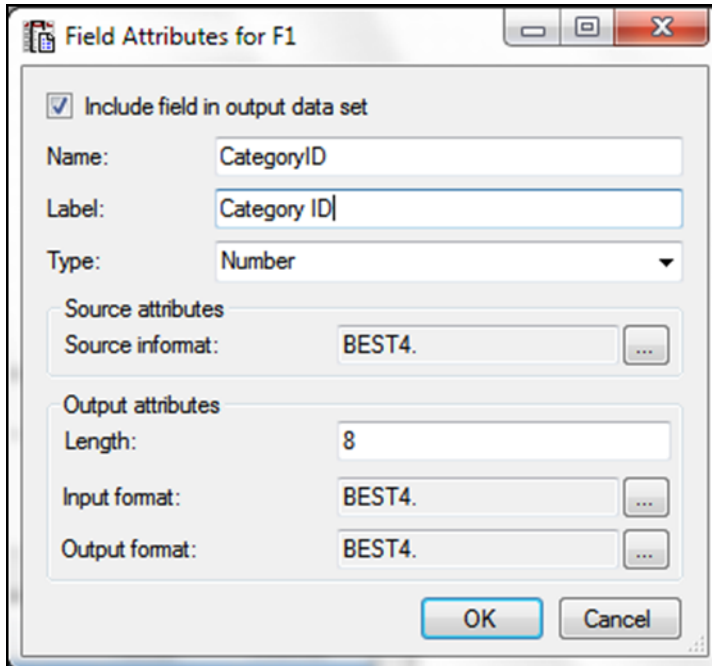
Exercise #2: Importing a Text File into your project, using Import Wizard

- Select **File -> Import Data...**
- Find and open **Data** folder in the **SAS Enterprise Guide 7.1 Sample** directory.
- Click the **FixWidth.txt** file, and then click **Open**.
- On **Step 1 of 4**, click the **Browse** button, and in the **File name** box, type **Categories**.
- Click **Save**, and then click **Next** to specify the text format.
- In the **Text format** area, select **Fixed columns**.
- To indicate the end of the first column and the start of the second column, click the 5th tick mark on the ruler.
- To indicate the end of the second column and the start of the third column, click the 20th tick mark on the ruler.
- Click **Next** to specify attributes for each field.
- To create a SAS data set that has two columns: **CategoryID** and **CategoryName**.
 - In the table of column attributes, column F1 is already selected. Click **Modify** to open the Field Attributes for F1 window.
 - In the **Name** box, type **CategoryID** (no space).
 - In the **Label** box, type **Category ID**. Make sure that variable **Type** is set to **Number** and click **OK**.
 - In the **Name** column, click **F2**, click **Modify** to open the Field Attributes for F2 window, and type **CategoryName**.
 - In the **Label** box, type **Product Category**. Click **OK**.
 - In the **Inc.** column (Include/Exclude column), clear the check box for column **F3** to exclude this column from the data set.

- Click **Next**
- In the **Import Data** task window, click **Finish**.
- Review the data set, and then **close** the Import Data dialog box.







Import Data (FixWidth.txt) ▾

Code Log Output Data

Modify Task Filter and Sort

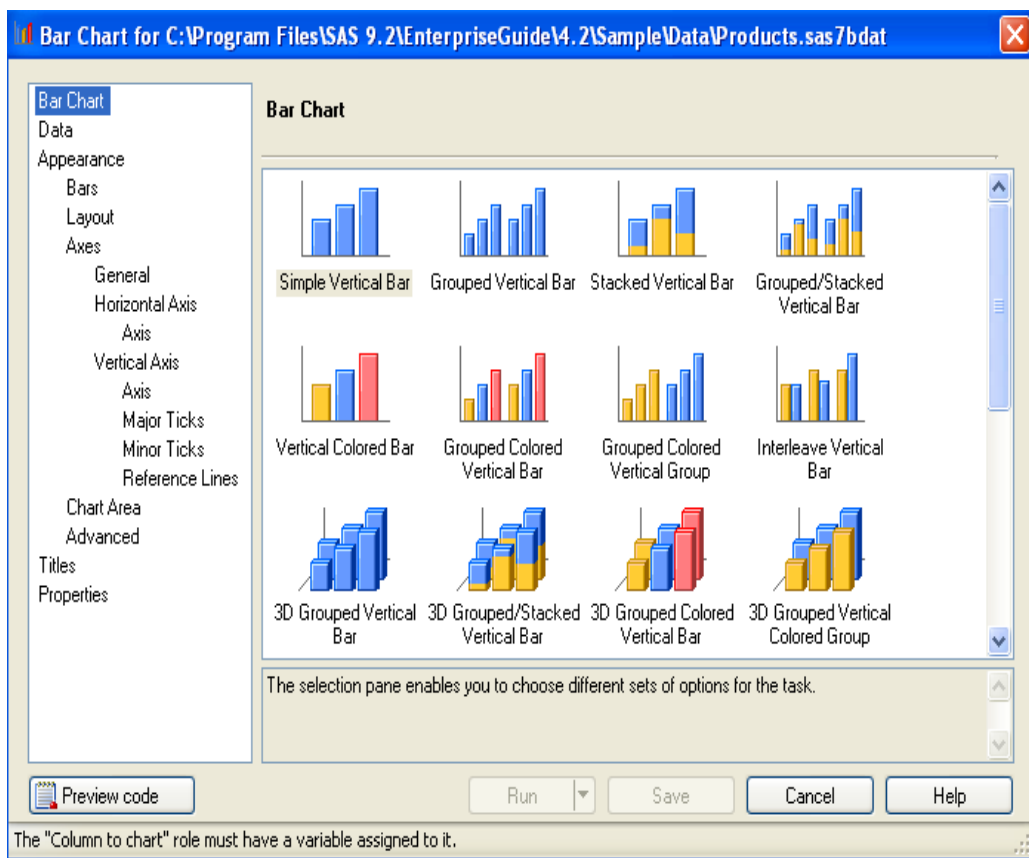
	CategoryID	CategoryName
1	1	Beverages
2	2	Condiments
3	3	Confections
4	4	Dairy Products
5	5	Grains/Cereals
6	6	Meat/Poultry
7	7	Produce
8	8	Seafood

Exercise #3: Importing an Excel data file into your project

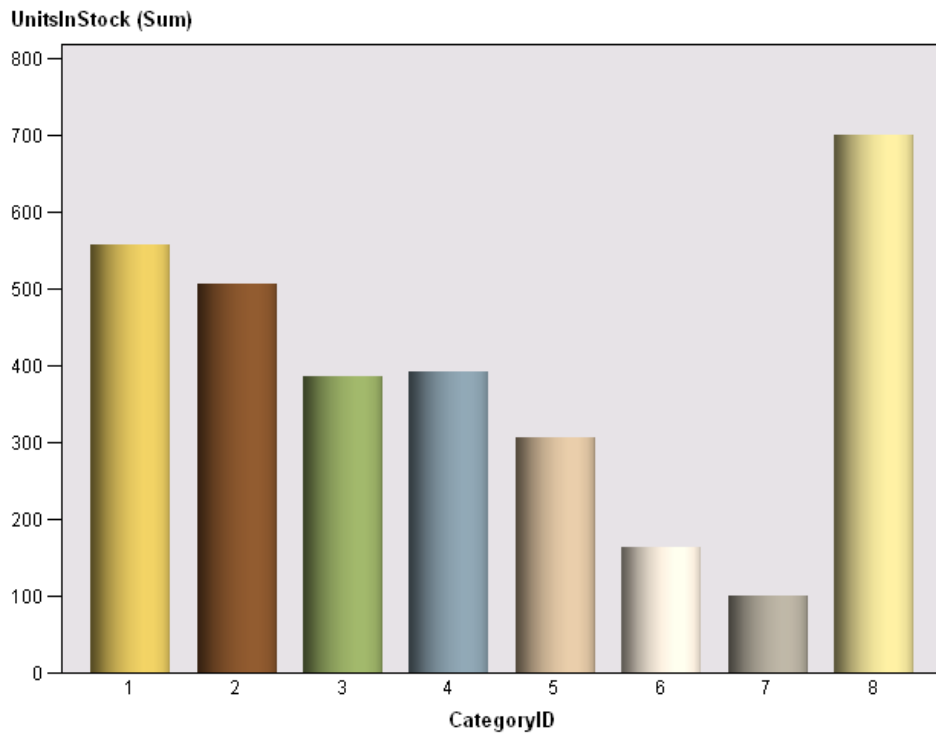
- Select **File -> Import Data...**
- Find and open **Data** folder in the **SAS Enterprise Guide 7.1 Sample** directory.
- Find and Open the **SupplyInfo.xls** file (**Suppliers\$**).
- Follow the steps , and then click Finish to import this data set.
- Close the data table window.

Exercise #4: Creating Charts

- In the **Process Flow** window, select the **Products** data set.
- From the SAS Enterprise Guide menu, select **Tasks -> Graph -> Bar Chart...**
- Click **Vertical Colored Bar**, and then in the selection pane, select **Data**.
- In the **Columns to assign** list, select **CategoryID** and drag it to the **Column to chart** role.
- In the **Columns to assign** list, select **UnitsInStock** and drag it to the **Sum of** role.
- On the **Appearance** tab -> **Bars** -> select different colors for bars.
- Click **Run** to create the graph.
- On the **Results-HTML** tab, double-click the graph -> **Graph Properties**.
- On the **Bar** tab, choose **Cylinder** from the **Bar Shapes:** drop down list, and check the Show labels box (under Data labels).
- Click **OK**.
- Close the chart windows.



Bar Chart



How to assign variables to analysis roles

After you select your data and your graph, in the selection pane, click **Data** to access these options.

- **Column to chart** - The values of the column that you assign to this role define the categories of data to chart. You must assign one variable to this role.
- **Bar Sum of** The column that you assign to this role determines the lengths of the bars. By default, if no column is assigned to this role, then the total number of observations (the frequency statistic) is used to determine the lengths of the bars. If a column is assigned to this role, then the sum of the values for each category determines the lengths of the bars.
- To choose "**statistic used to calculate bar:**" select **Advanced** in the selection pane (under the **Appearance**).
- **Line sum of** - When creating **Bar-Line Chart...**, the columns that you assign to this role specify the variables to use for the line plots. To choose the

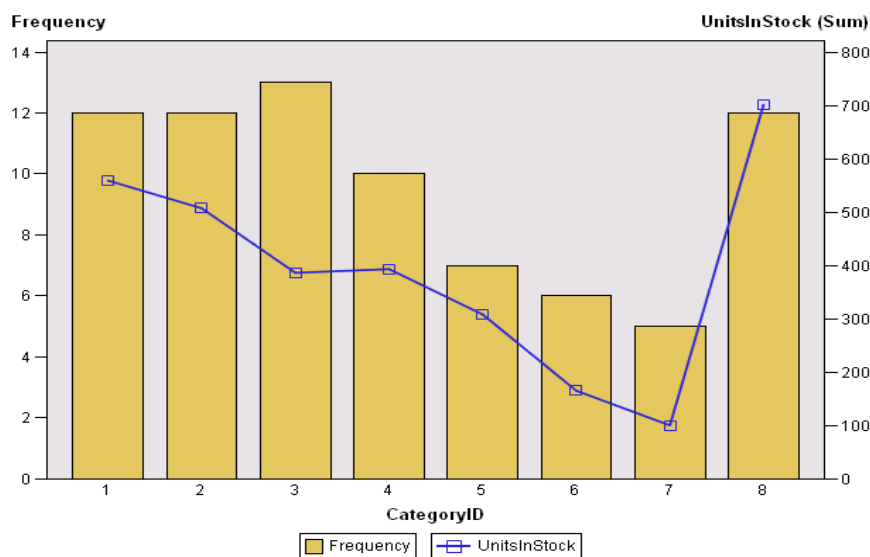
statistic that is used to plot each line, select **Plots** in the selection pane. By default, the sum of the values for each category is used to plot each line

- **Stack** – When creating **Bar Chart** -> **Stacked Horizontal Bar**, the values of the column that you assign to this role determine the number of segments in each bar.
- **Group charts by** - Separate charts are generated for each group. The groups are determined by the values of the column that you assign to this role.
- **To select the sort order for each variable** -Select the variable under the **Group charts by** role, and then from the **variable-name sort order** drop-down list, select **Ascending** or **Descending**.

Exercise #5: Creating Bar-Line Charts

- In the **Process Flow** window, select the **Products** data set again.
- From the SAS Enterprise Guide menu, select **Tasks** -> **Graph** -> **Bar-Line Chart...** (Or double-click the Products table, and use the menu on the open table).
- In the Columns to assign list, select CategoryID and drag it to the Column to chart role.
- In the Columns to assign list, select UnitsInStock and drag it to the Line sum of role.
- Click Run to create the graph.
- Review and then close the chart windows.

Bar-Line Chart



Queries

A query is a request to retrieve data from one or more data sources (tables).

The Enterprise Guide **Query Builder** enables you to extract data from one or more tables according to criteria that you specify. In the background, the Query Builder generates **Structured Query Language (SQL)** code, which you can view.

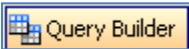

Using queries, you can

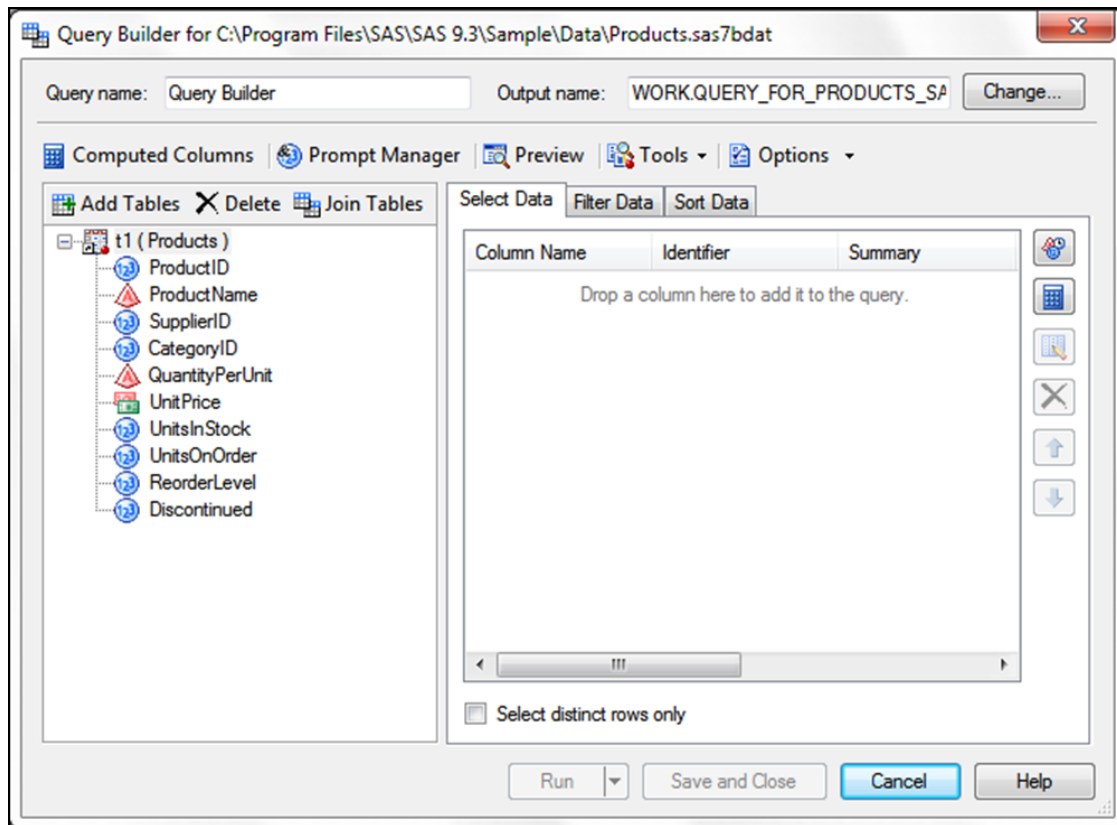
- Join Tables;
- Group and Summarize Data;
- Classify data into groups based on the values in a column;
- Perform summary functions on any of the columns in your query;
- Examine relationships between data values;
- Subset and sort your data;
- Compute values; and
- Group and summarize data.

Building Queries

SAS **Query Builder** enables you to extract data from one or more tables according to criteria that you specify. In the background, the Query Builder generates **Structured Query Language (SQL)** code, which you can view if you are creating a simple query that involves filtering or sorting a single table, and then you can also use the Filter and Sort window to create your query.

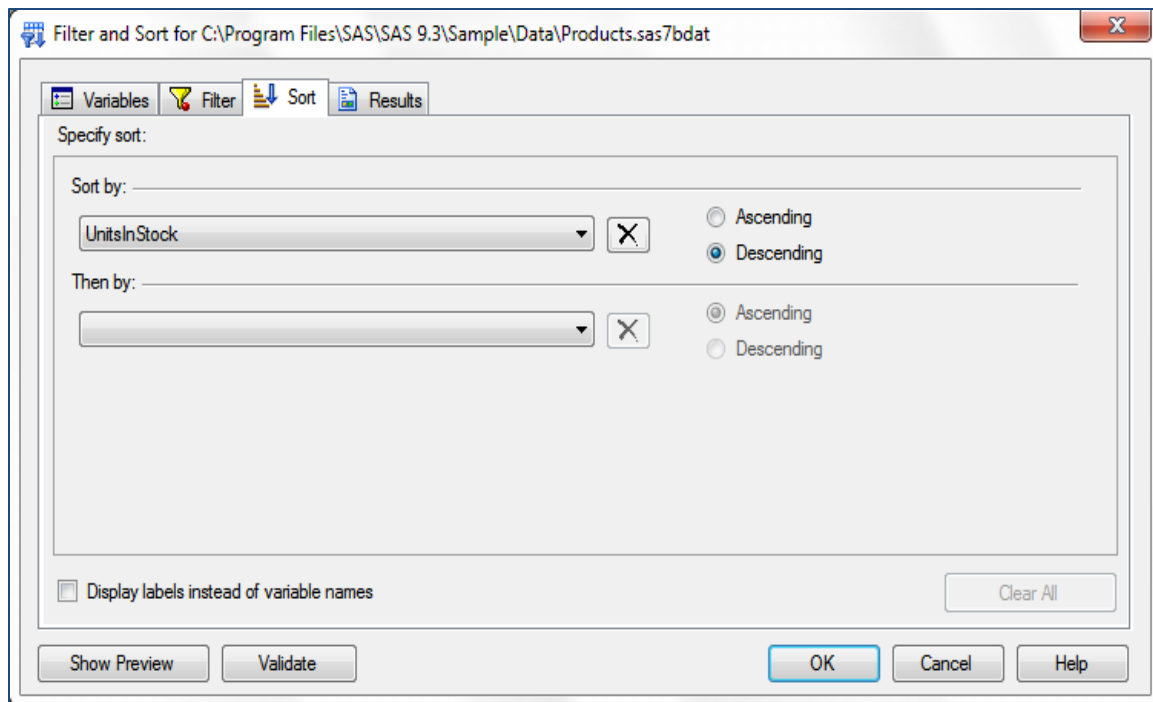
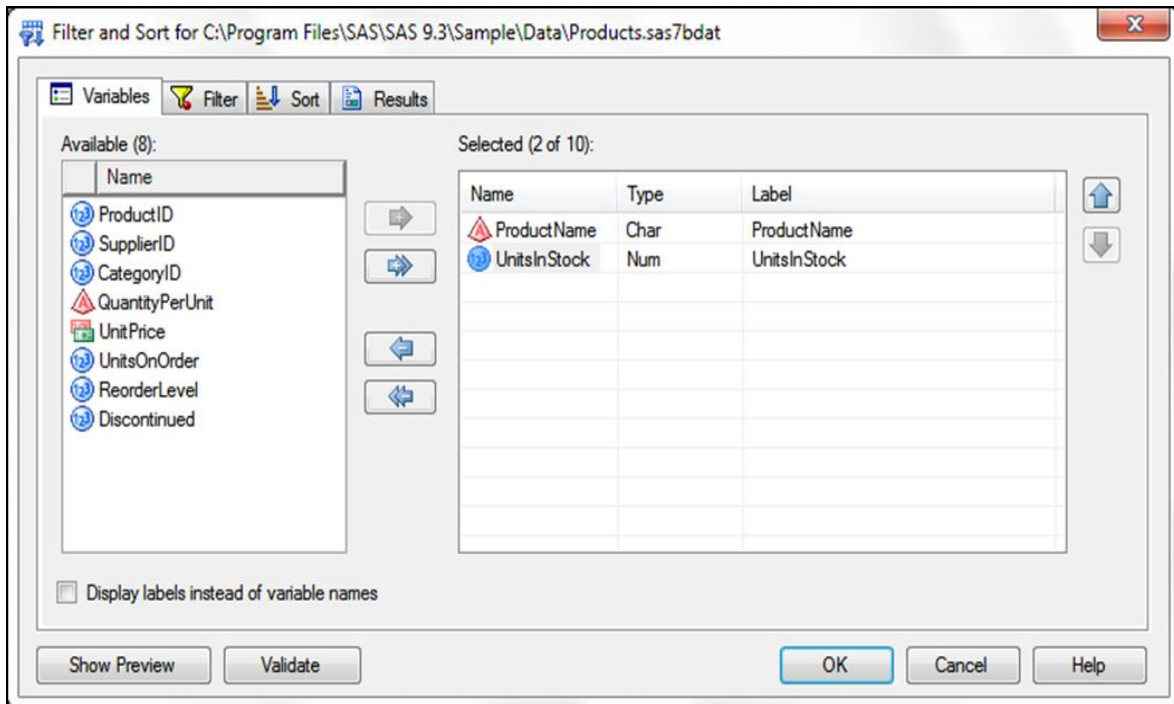
Creating a new query

- **To create a new query based on open data:**
 - Open the data that you want to query and click the **Query Builder** button in the workspace 
- **To create a new query without open data**
 - Select **Tasks -> Data -> Query Builder...**
 - Then use the Change button  to select a table.



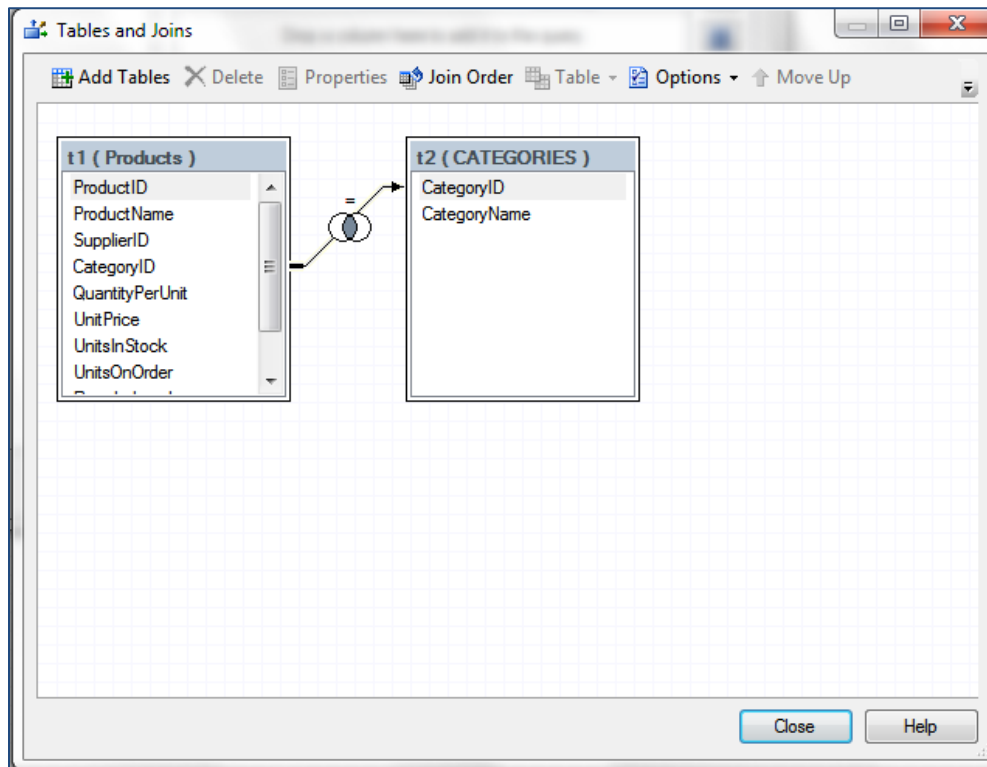
Exercise #6: Filter data set, using Filter and Sort ...Task

- On the **Process Flow** window, select the **Products** table.
- Click **Tasks** -> **Data** -> **Filter and Sort ...**
- On the **Variables** tab, double-click on **ProductName** and **UnitsInStock** variables.
- On the **Filter** tab, in the 1st box, select the **UnitsInStock** from the drop-down list of variables.
- In the 2nd box, select "**Greater than**"
- In the 3rd box, select or type "**0**" for the **Value:** (to create **Products.UnitsInStock > 0** expression for Filter definition).
- On the **Sort** tab, select the **UnitsInStock**
- For Sort Direction, choose the **Descending** radio button.
- Click **OK**.
- View the results and then **close** the query result table.



Exercise #7: Creating a Query by Joining Tables, using the Query Builder task

- In the **Process Flow**, click **Products** to make it the active data set.
- Select **Tasks** -> **Data** -> **Query Builder...**
- In the Query Builder window, click **Add Tables...** button.
- In the Open Data window, double-click the **Work.CATEGORIES** file.
- In the Query Builder window, click **Join Tables...** button.
- Close the "**Tables and Joins**" window, but **don't** close the Query Builder window.

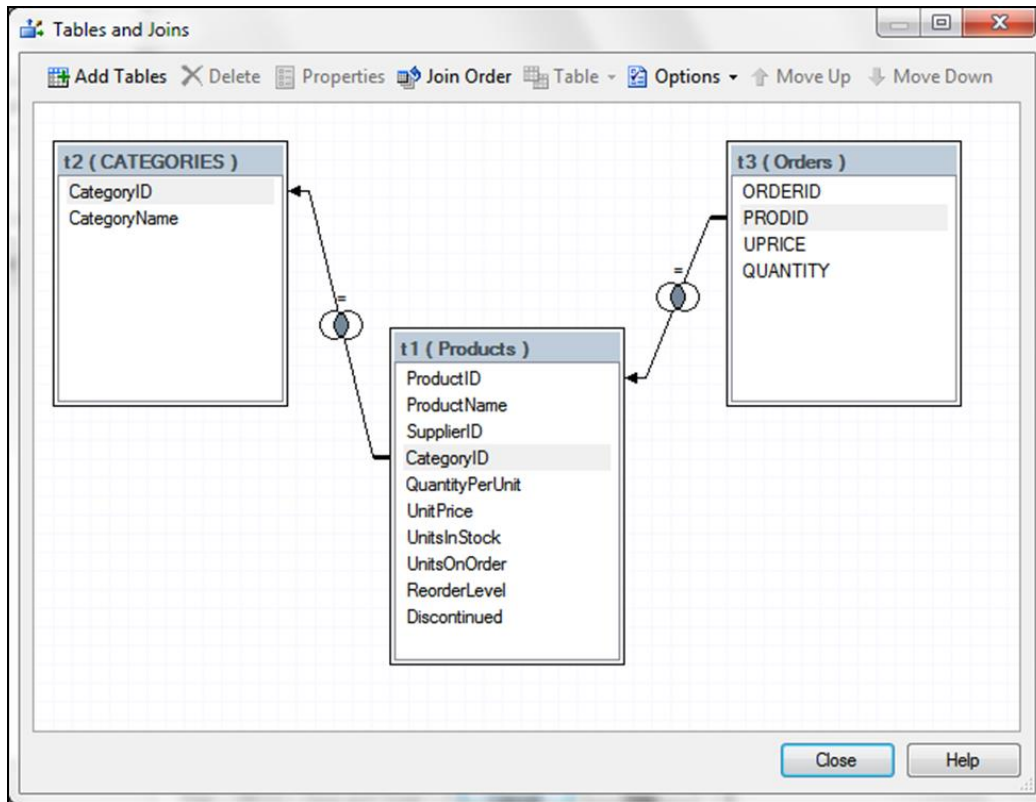


Exercise #8: Performing manual join

- In the **Process Flow** window, select the **Products table**.
- From the **Tasks** menu -> **Data** -> **Query Builder...**
- Click **Add Tables...** button
- In the Open Data window, select **Orders** table and click **Open** to add it to the query. Because no column name and type matches are found, a message window alerts you that "*A suitable join could not be determined for the new*

table. You will have to manually join the tables". In the message window, click **OK**.

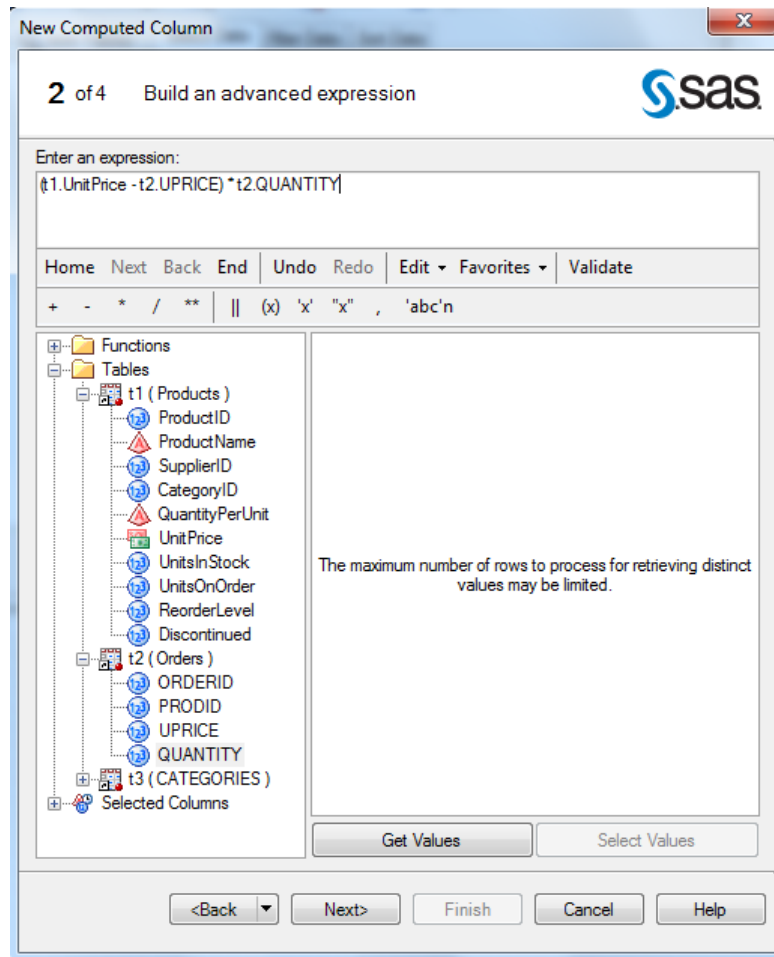
- Although the column names are different, the values in the **ProductID** and **PRODID** columns are related and have same data types. You can join the Products and Orders tables on these columns.
- Click the PRODID column and drag the cursor to the ProductID column, and then click **OK**.
- Close the Tables and Joins window, but DON'T close the Query Builder window.



Exercise #9: Creating a Calculated Column to Calculate the Profit

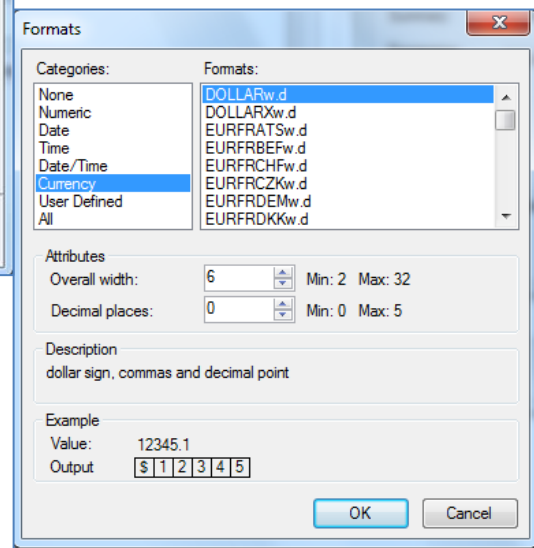
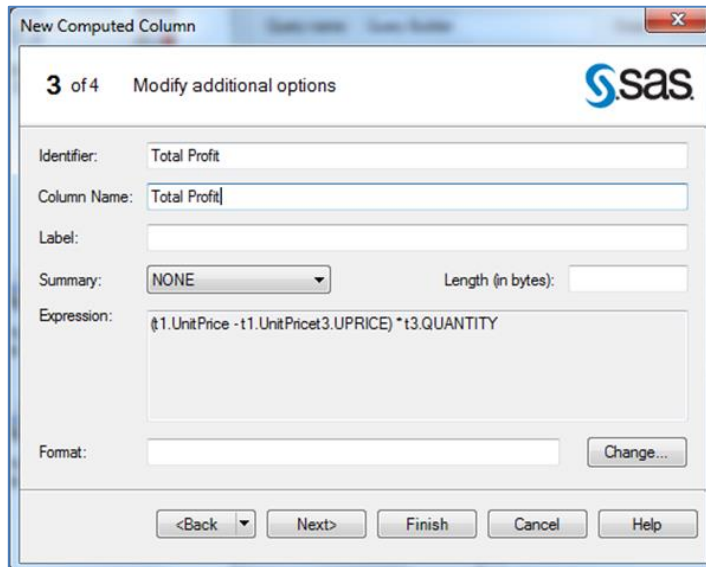
We want to create a calculated column that contains the profit that is earned from each order. The Products data set contains the variable **UnitPrice**, which is the **retail price** of the product. The Orders data set contains the variables **UPRICE**, which is the **cost**, and **QUANTITY**, which is the **number sold**. From these three variables, you can calculate the **profit** that is earned from each order.

$$\text{Total Profit} = (\text{UnitPrice} - \text{UPRICE}) * \text{Quantity}$$




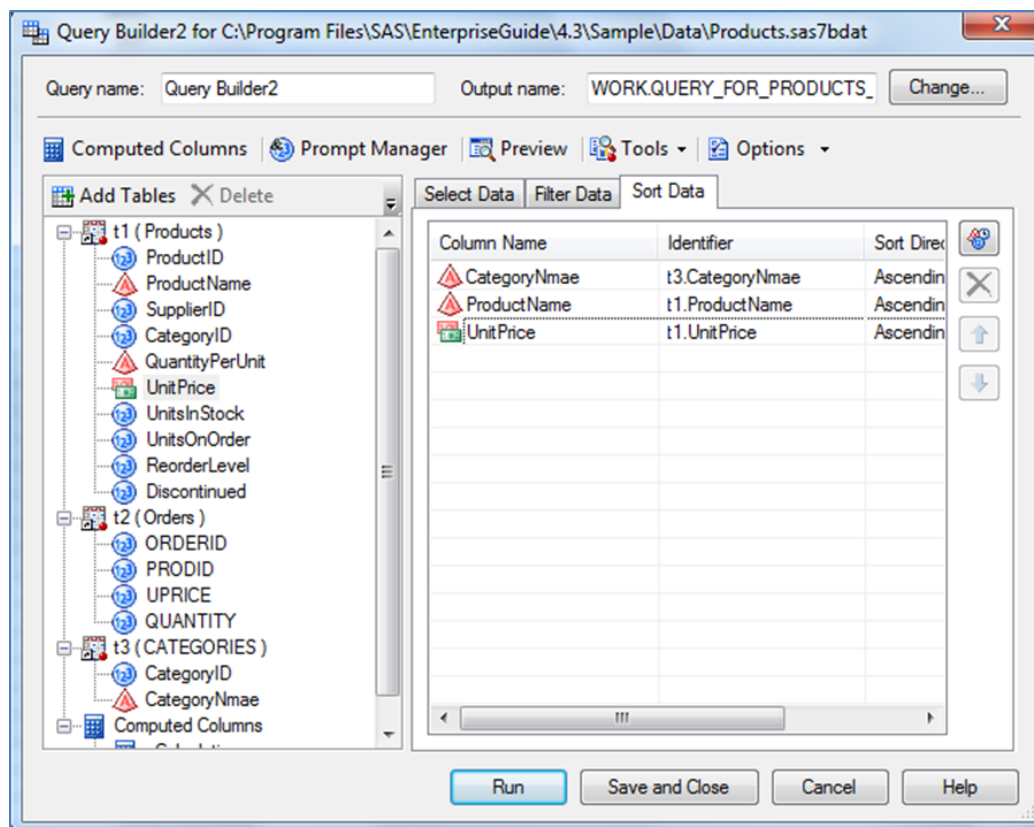
- In the **Query Builder** window, on the **Select Data** tab, double-click the **ProductName**, and **CategoryName**, variables.
- Click **Computed Columns...** button.
- In the Computed Columns window, click the **New...** button
- In the **New Computed Column** wizard, select the **Advanced expression** radio button, and then click **Next**.
- On the Build an advanced expression page of the New Computed Column wizard, expand the **Products** table, located just below the row of operator buttons.
- Double-click **UnitPrice** to add the variable to the Expression text box.
- Click the subtraction operator (-).
- Under the **Tables**, expand the **Orders** table.
- Double-click the **UPRICE** variable.

- Use your mouse pointer to highlight the expression, and then click the parentheses operator (X).
- Click the multiplication operator (*).
- From the **Orders** table, double-click **QUANTITY**.
- Click **Next**.
- In the **Column Name:** and the **Identifier:** boxes, type **Total Profit**.
- Click **Next**.
- On step **3 of 4**, at the bottom of the page, notice that for **Format**, none is used. Click the **Change...** button.
- In the **Categories:** box, select **Currency**. In the **Formats:** box, select **DOLLARw.d**, from the drop down list. Click **OK**.
- Click **Next** to view a summary of the properties for the computed column, and then click **Finish**.
- Close the **Computed Columns** window.
- Review, and then click **Run**.
- **Close** the **Query Builder** task.



Exercise #10: Sorting using the Query Builder Task

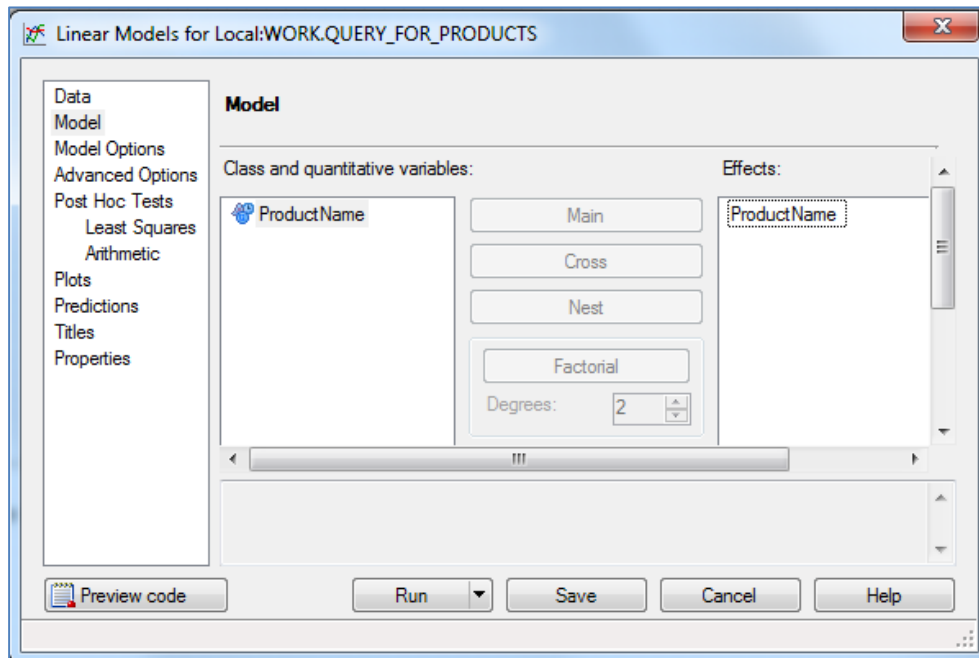
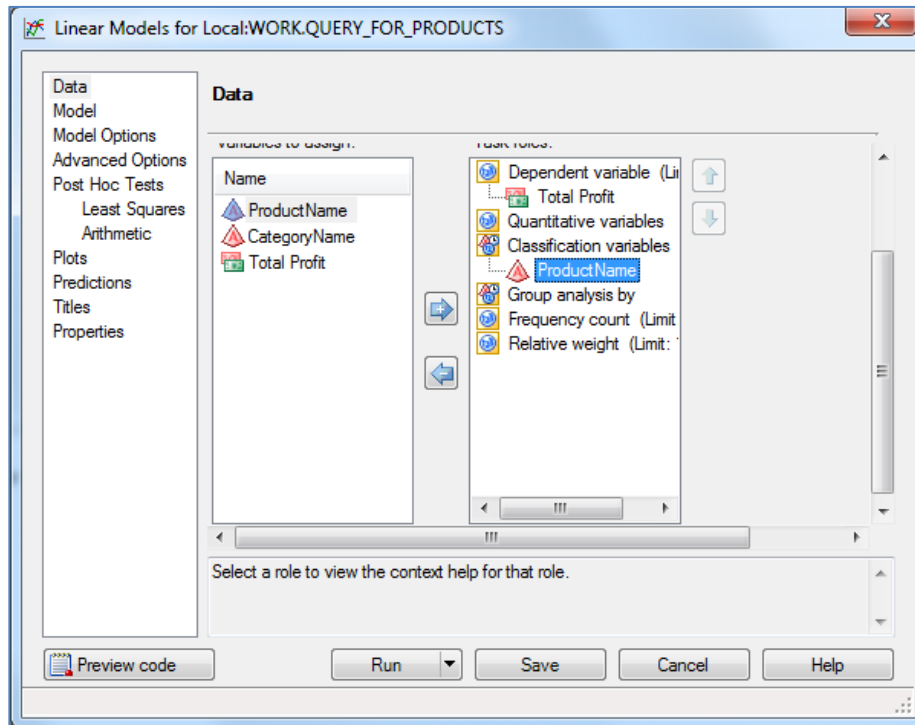
- Open the last Query, and click the **Modify Task** button.  **Modify Task** |
- On the **Sort Data** tab, double-click **the CategoryName, ProductName, and the UnitPrice** variable names, in that order.
- Click **Run**. Click **yes**, to replace the result with previous result.
- The table is first sorted by **CategoryName**, then by **ProductName**, and then by **UnitPrice**.
- **Close** this output data window.

**Exercise #11: Performing a Linear Model Analysis**

You can use the Linear Models Task to determine whether the variable ProductName can be relied on, to predict Total Profit.

- Select the Query-for-Products output to make it active.
- Select **Task** -> **ANOVA** -> Linear Models
- Assign **Total Profit** to Dependent variable role, and **ProductName** to Classification variable role. This enables you to test for the effect of ProductName on Total Profit.

- In the selection pane, click **Model**.
- In the **Class and quantitative variables** list, select **ProductName**.
- Click **Main**.
- Click **Run**.



Linear Models

The GLM Procedure

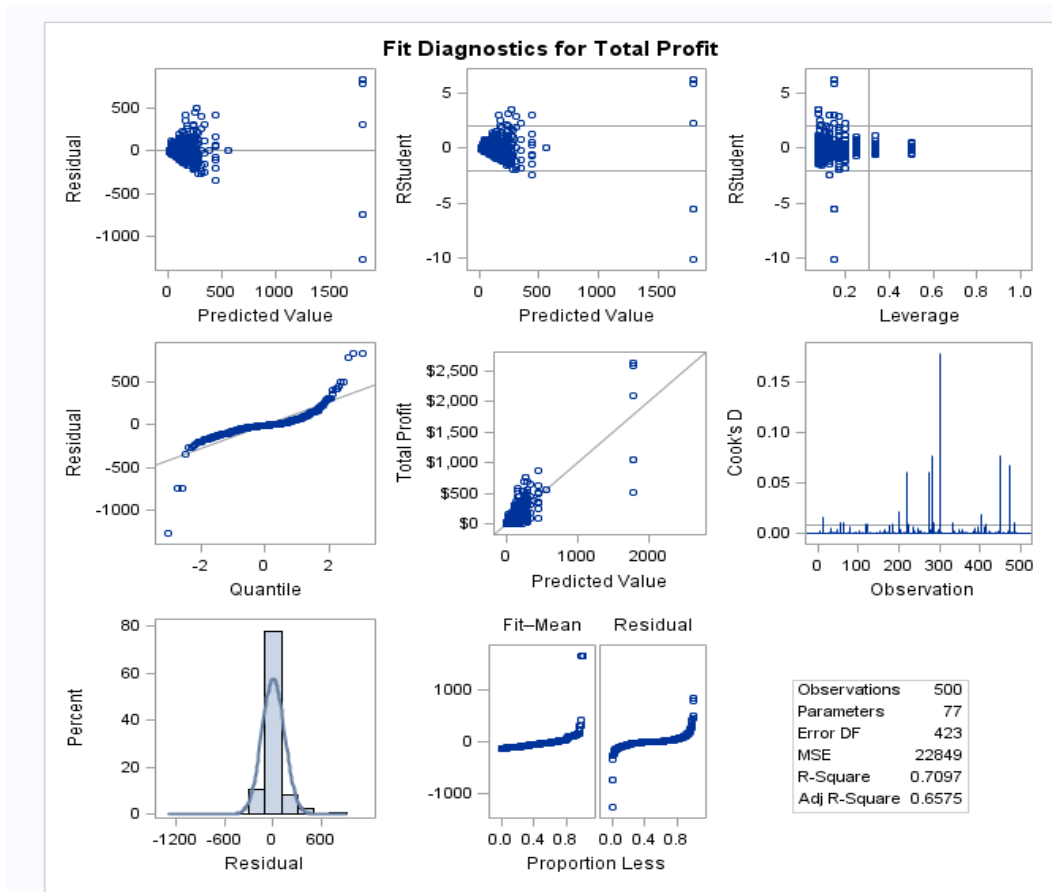
Dependent Variable: Total Profit

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	76	23624696.37	310851.27	13.60	<.0001
Error	423	9665301.97	22849.41		
Corrected Total	499	33289998.33			

R-Square	Coeff Var	Root MSE	Total Profit Mean
0.709663	101.4935	151.1602	148.9358

Source	DF	Type I SS	Mean Square	F Value	Pr > F
ProductName	76	23624696.37	310851.27	13.60	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
ProductName	76	23624696.37	310851.27	13.60	<.0001

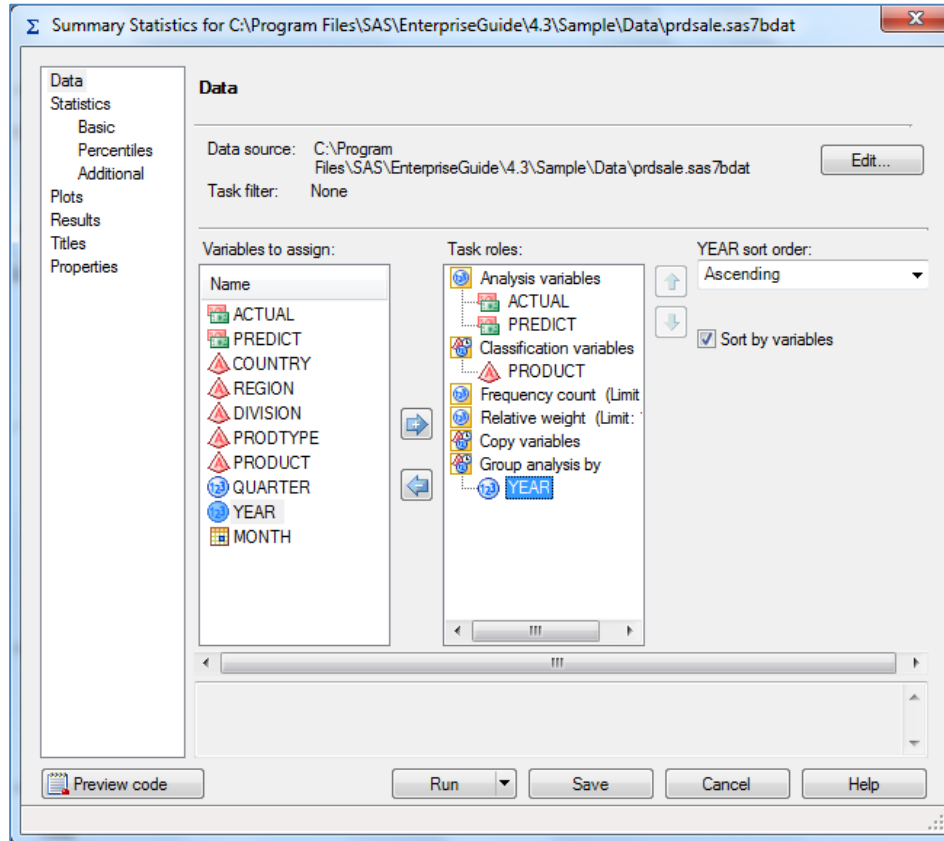


Results:

- $F=13.60$ and P-value is less than 0.0001 (significant), so the results show that ProductName is a good indicator of profitability, as you might have suspected.
- Looking at the column labeled Pr >| t | (in the last output table), you find that the following seven products with P-value < 0.05 are good indicators of profitability:
 - Cote de Blaye
 - Manjimup Dried Apples
 - Northwoods Cranberry Sauce
 - Raclette Courdavault
 - Sir Rodney's Marmalade
 - Thuringer Rostbratwurst
 - Vegie-spread

Exercise #12: Creating Summary Statistics (Means Procedure)

- In the **Process Flow**, click the **PRDSALE** table to make it the active data.
- From the **Tasks** menu, select **Describe**, and then **Summary Statistics...**
- Press **CTRL** and select **ACTUAL**, and **PREDICT** Variables, and drag them to the **Analysis Variables** Task roles.
- Select the **PRODUCT** variable and drag it to **Classification Variables** Task roles.
- Select **YEAR** and drag it to **Group Analysis by** Task roles.
- Click **Run**.
- Close the output window.



Summary Statistics
Results
The MEANS Procedure

Year=1993

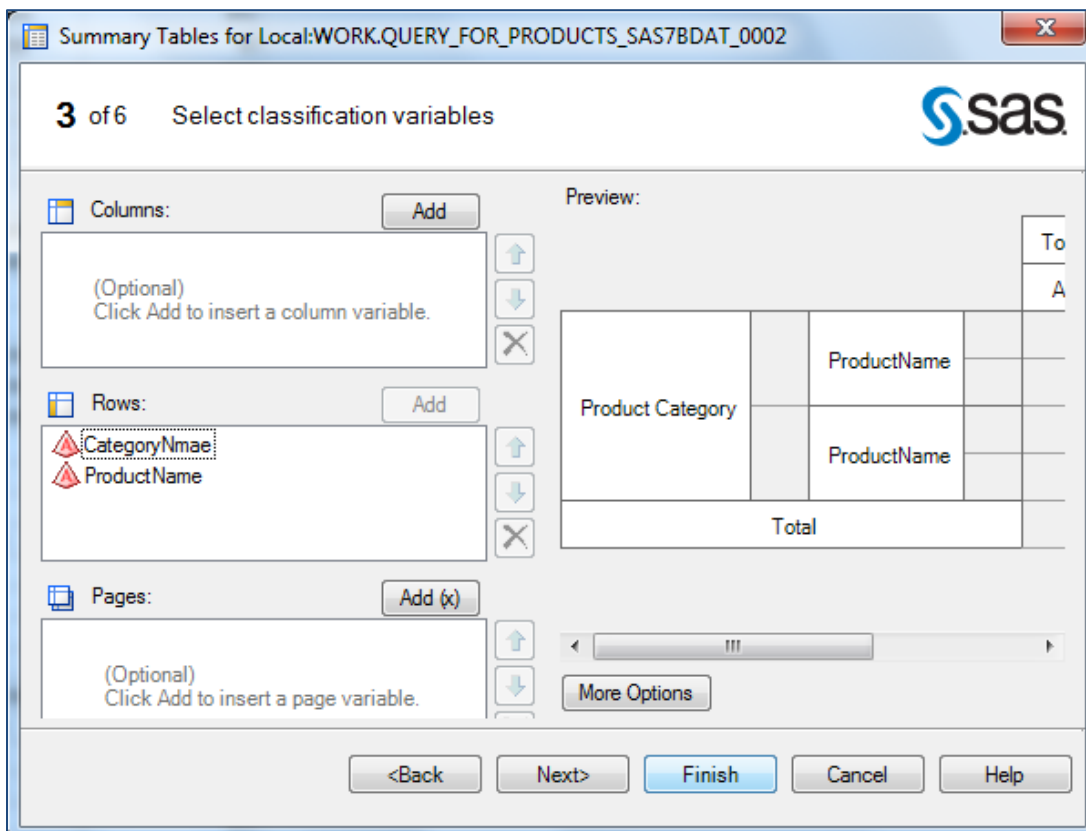
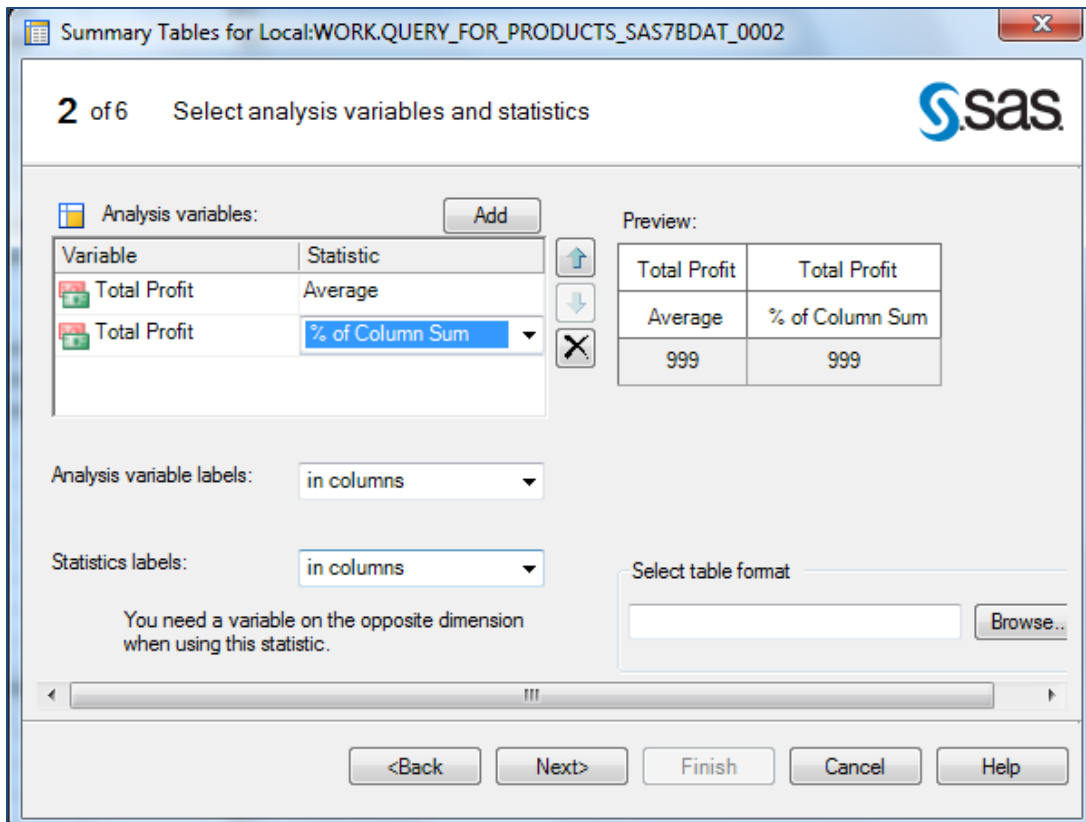
Product	N Obs	Variable	Label	Mean	Std Dev	Minimum	Maximum	N
BED	144	ACTUAL	Actual Sales	482.3819444	295.0121011	3.0000000	993.0000000	144
		PREDICT	Predicted Sales	492.5208333	282.3830154	4.0000000	993.0000000	144
CHAIR	144	ACTUAL	Actual Sales	507.0833333	277.3104468	21.0000000	995.0000000	144
		PREDICT	Predicted Sales	482.6250000	277.9004167	31.0000000	988.0000000	144
DESK	144	ACTUAL	Actual Sales	528.9375000	275.4419264	6.0000000	996.0000000	144
		PREDICT	Predicted Sales	477.9652778	297.0760401	6.0000000	998.0000000	144
SOFA	144	ACTUAL	Actual Sales	551.6111111	301.3917858	4.0000000	999.0000000	144
		PREDICT	Predicted Sales	531.0972222	276.7927280	1.0000000	982.0000000	144
TABLE	144	ACTUAL	Actual Sales	495.7986111	294.2436928	6.0000000	994.0000000	144
		PREDICT	Predicted Sales	517.2569444	276.6358528	10.0000000	987.0000000	144

Year=1994

Product	N Obs	Variable	Label	Mean	Std Dev	Minimum	Maximum	N
BED	144	ACTUAL	Actual Sales	503.9861111	268.4821356	15.0000000	991.0000000	144
		PREDICT	Predicted Sales	464.8888889	314.5642810	0	998.0000000	144
CHAIR	144	ACTUAL	Actual Sales	522.6388889	291.8366152	13.0000000	1000.00	144
		PREDICT	Predicted Sales	462.5833333	275.8512952	17.0000000	999.0000000	144
DESK	144	ACTUAL	Actual Sales	507.3958333	297.1502462	12.0000000	997.0000000	144
		PREDICT	Predicted Sales	537.2777778	278.4146539	13.0000000	979.0000000	144
SOFA	144	ACTUAL	Actual Sales	480.2500000	292.7057163	3.0000000	996.0000000	144
		PREDICT	Predicted Sales	444.2569444	289.8196629	0	1000.00	144
TABLE	144	ACTUAL	Actual Sales	491.7013889	275.9964548	34.0000000	1000.00	144
		PREDICT	Predicted Sales	494.3541667	280.0434649	12.0000000	992.0000000	144

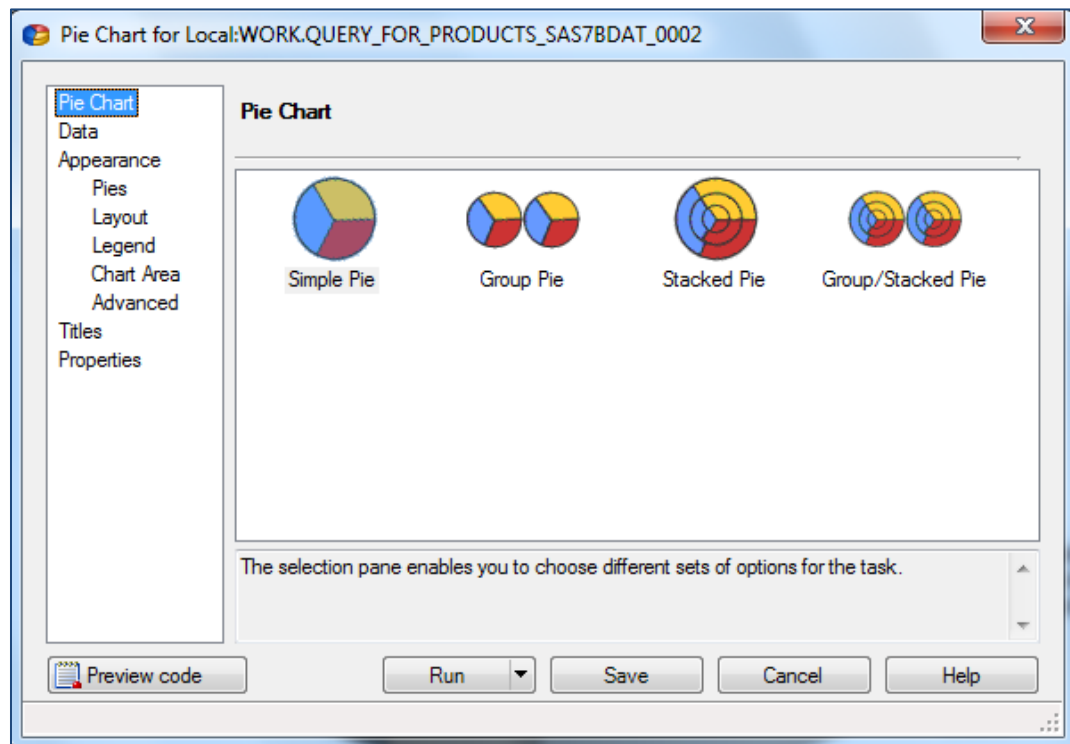
Exercise #13: Generating Summary Tables from a Query

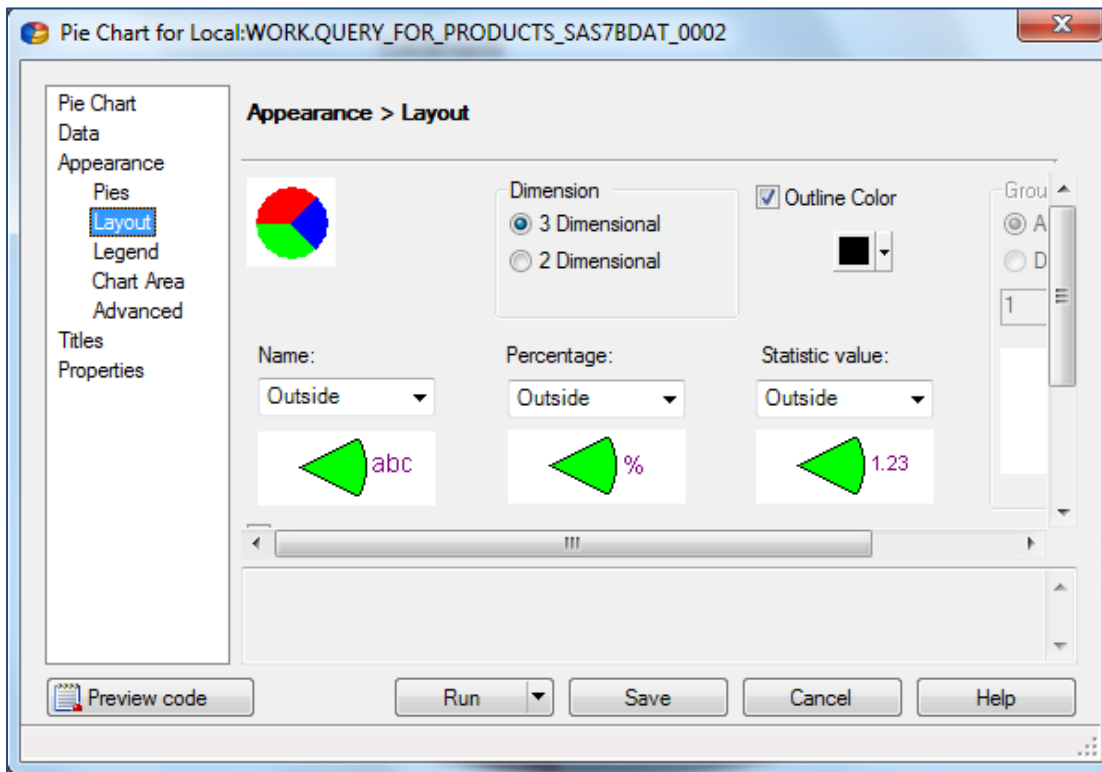
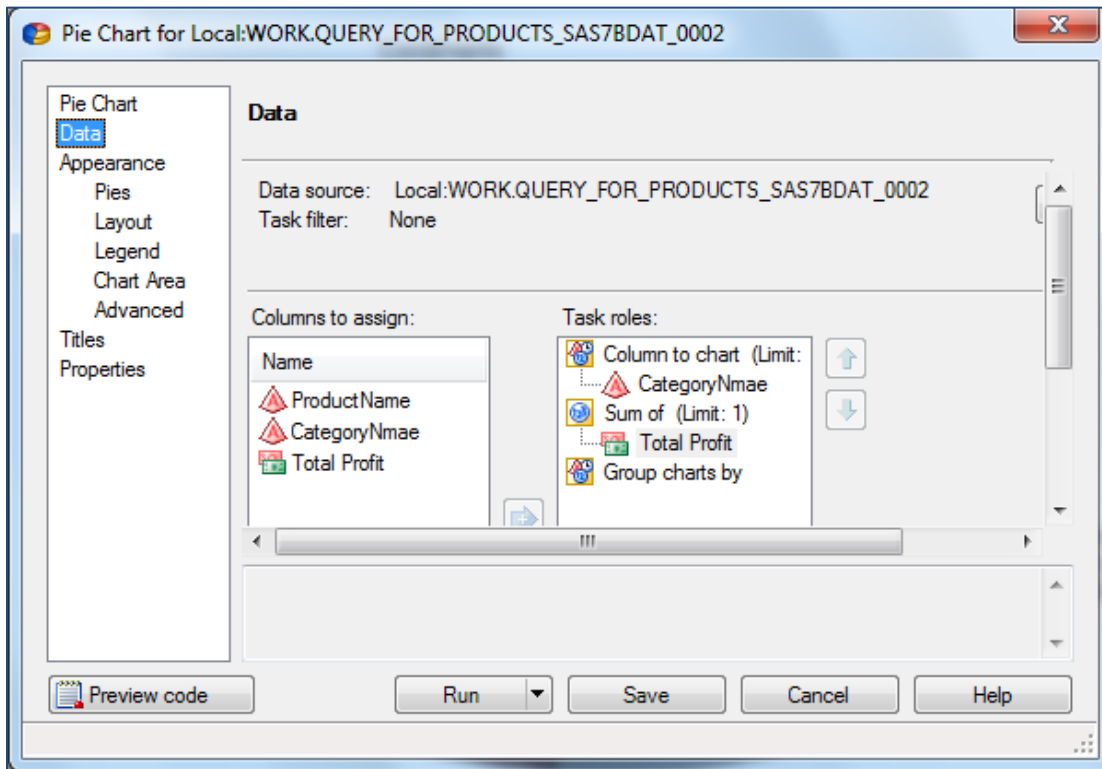
- In the **Process Flow**, select the last query we created to make it active (SAS data set with Total Profits).
- From the Tasks menu, select **Describe** -> **Summary Tables Wizard...** (step 1 of 6).
- Click **Next**
- From the **Add button** drop down list, select **Total Profit** variable, and select **Average** from the **Statistic** drop-down list (default is **Sum**).
- From the **Add button** drop down list select **Total Profit** variable again, and select **% of Column Sum** from the **Statistic** drop-down list (Step 2 of 6).
- Click **Next**
- In the **Rows** section, click **Add button** and select **CategoryName**, and **ProductName** (Step 3 of 6).
- Click **Next**
- In the **Rows:** box; select **Totals at Each level**, from the drop down list (Step 4 of 6).
- Click **Next** twice (Step 5 of 6).
- In the **Table Title** box, type: **Profit By Products**, and delete the Footnote (Step 6 of 6).
- Click **Finish**.
- Review the **HTML** output, and then close the Output window.



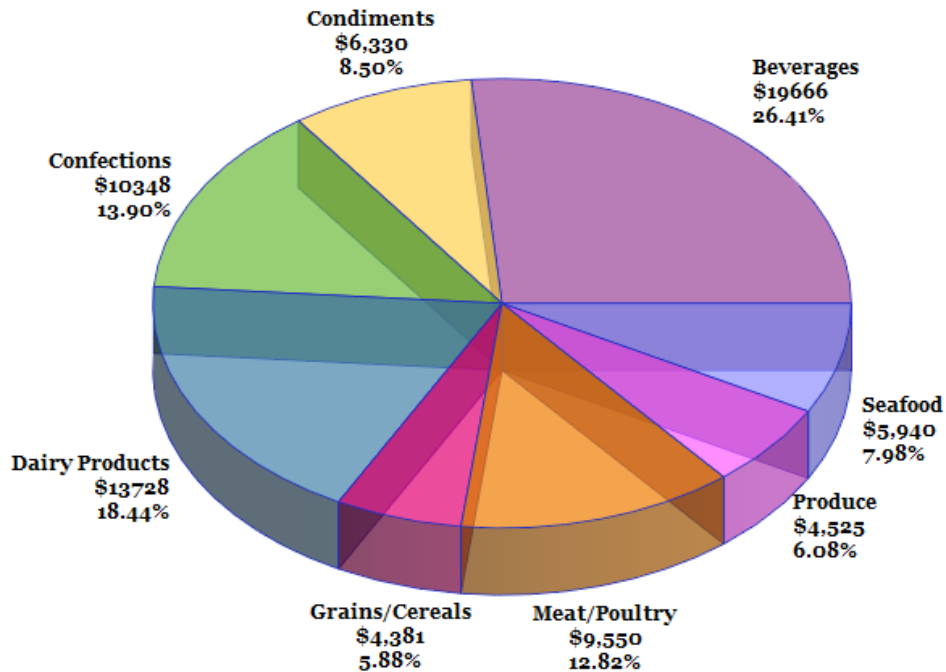
Exercise #14: Creating a Pie Chart

- In the **Process Flow**, select the last query result data set that we created (SAS data set with Total Profits), to make it active.
- From the **Tasks** menu, select **Graph > Pie Chart...**
- In the Pie Chart gallery, select the **Simple Pie** icon.
- In the selection pane, click **Data**.
- Assign the **CategoryName** column to the **Column to chart** role.
- Assign the **Total Profit** column to the **Sum of** role.
- In the selection pane, click **Layout**.
- Select **3-Dimensional**.
- Select **Outside** for **Name:**, **Percentage:**, and **Statistic Value:** from drop-down list boxes
- In the selection pane, click **Titles**.
- For the graph, clear the **Use default text** check box and type **Profit by Product Category**.
- Click **Run**.
- Review the pie chart. Each slice of the pie is labeled with the category name, total profit, and percentage as you specified.
- Close any open windows in the workspace.





Profit by Product Category



Exporting and Sending Files (E-mail or to Word, Excel, or PowerPoint)

You can send a copy of a file in a SAS Enterprise Guide project to another user through electronic mail. Files that you can send include **data, programs, logs, results,** and **notes.**

To send files through e-mail, you need to have installed an e-mail application such as Microsoft Outlook that supports the Messaging Application Programming Interface (MAPI). Depending on the file type, you can also send a copy of the active file to Microsoft Word, Excel, Internet Explorer, or PowerPoint.

Note: In order to send results in the SAS Report format to any Microsoft Office application, **you must have the SAS Add-In for Microsoft Office installed on your computer.**

To send a file to another user

- In the project tree, or process flow, select the file that you want to send to another user.
- Select **File -> Send To -> E-mail Recipient...**

To send a file to Microsoft Word

- In the project tree, or process flow, select the file that you want to send. You can send **data, programs, logs, results,** and **notes** to Microsoft Word.
- Select **File -> Send To -> Microsoft Word.**

To send a file to Microsoft Excel











- In the project tree, or process, select the data file that you want to send.
- Select File -> Send To -> Microsoft **Excel.**

Exercise #15: Exporting the Query Results

- Right-click on the query results data node (**Filter_For_Products**)
- Select Send to > Microsoft Excel.
- Close the Excel program.

To preview results

- **Open** the results item that you want to preview by clicking the appropriate tab in the workspace or by double-clicking it in the process flow.
- Select **File -> Print Preview** for *results-name*.
- There are several options that you can select within the Print Preview window:

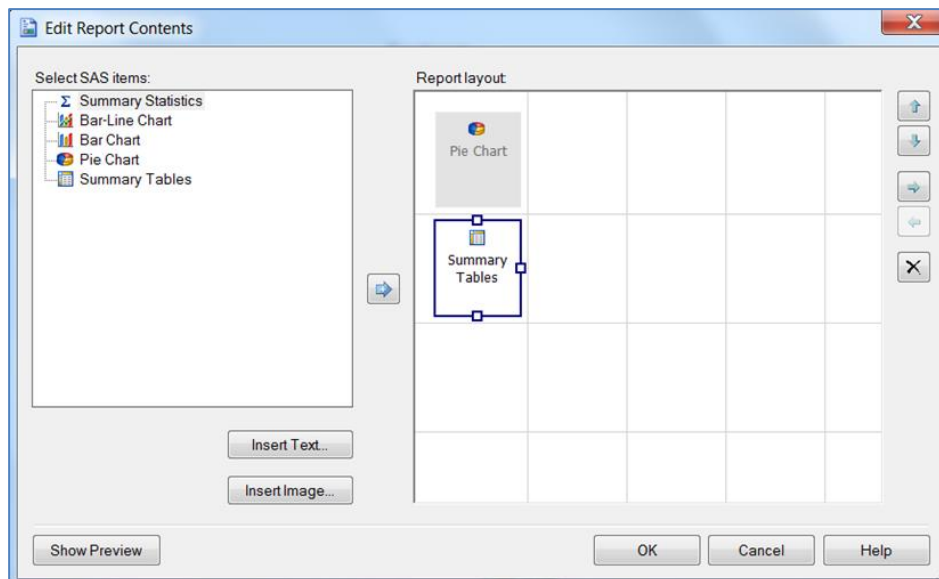
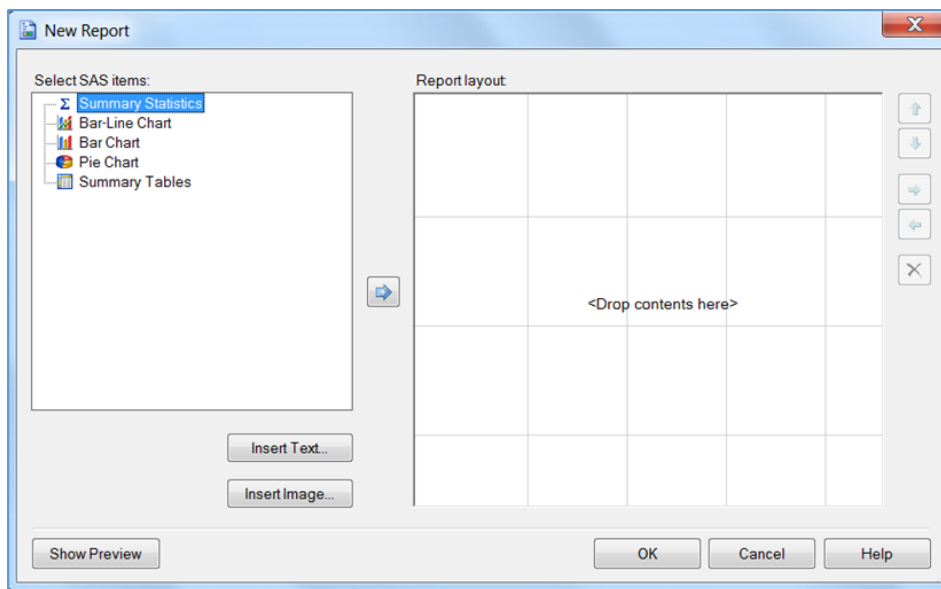
Print	brings up the Print window to print the file
Page Setup ()	enables you to set certain options regarding the page setup for printing
First Page ()	displays the first page of the file
Previous Page ()	displays the previous page of the file
Page box	displays the number of the active page of the file  You can also jump to a specific page in the file by entering the page number in the Page box.
Next Page ()	displays the next page of the file
Last Page ()	displays the last page of the file
Zoom Out ()	reduces the scale of the page that you are viewing  You can also zoom out by selecting a percentage or page view from the drop-down list.
Zoom In ()	enlarges the scale of the page that you are viewing  You can also zoom in by selecting a percentage or page view from the drop-down list.
Close	exits the Print Preview window and returns to the main SAS Enterprise Guide window

Exercise #16: Annotating a Process Flow

If you have your results in SAS Report Format, then you can create an HTML Document and Add Results.

- **File -> New -> Report.**
- In the **Select SAS items**, select **Pie Chart**, and **Summary Tables** (using the **Ctrl** key).
- Click the **Add** button.

Note: You can e-mail your document by right-clicking the report, and then select Send To -> Email Recipient ...



Online Resources

- **Statistics Using SAS Enterprise Guide** by James B. Davis, 2007.
- **Basic Statistics Using SAS Enterprise Guide**, a Primer, by Geoff Der, and Brian S. Everitt, 2007. Preview this book at <http://books.google.com>
- **The Little SAS® Book: a primer 5th edition**, by: Susan Slaughter and Lora Delwiche, Feb. 11, 2013 available from TTU Safari e-Books <http://library.ttu.edu>
- **SAS Online Resources** for Statistics Education
<http://support.sas.com/statlibrary>
- **SAS Programming for Enterprise Guide Users**, by Neil, 2007 available from TTU Safari e-Books.

Where to Get Help

- If you need help from me, please e-mail heide.mansouri@ttu.edu, or call 834-2935 to make an appointment.

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Please e-mail your comments or suggestions to: heide.mansouri@ttu.edu