



TECHNOLOGY  
SUPPORT

# Excel PowerPivot SHORTCOURSE HANDOUT



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# Excel PowerPivot

## ShortCourse Handout



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### Introduction

Microsoft **PowerPivot in Excel 2013** is an **Add-in** tool that can be used to perform powerful data analysis in **Excel 2013**. The add-in is available in **Microsoft Office Professional Plus**. PowerPivot enables you to import data from virtually any data source, such as Microsoft Access databases, Text files, Excel files, and live data imported from a Web sites. PowerPivot for Excel allows you to create a variety of visual data, such as PivotTable, and PivotCharts. In both Excel and in PowerPivot, you can create a **Data Model**, a collection of **tables** with **relationships**.

Data Models are created implicitly when you import two or more tables simultaneously in Excel. However, Data Models are created explicitly when you use the PowerPivot Add-in to import data. In the Add-in, the model is represented in a tabbed layout, where each tab contains tabulated data.

Any data you import into Excel is available in PowerPivot, and vice versa. By using PowerPivot you can analyze data in ways that go way beyond "regular Excel". You can get more done in less time.

**Credit:** This document was adapted from Microsoft Excel 2013 Help and Documentation.

## Course Objectives

After completing this ShortCourse, you should be able to:

- Import data from multiple sources;
- Create linked data;
- Create relationships between data from different sources;
- Perform calculations in PowerPivot;
- Rename columns;
- Create PivotTables and PivotCharts; and
- Add Slicers.

## Activating the PowerPivot Add-in

The simplest way to activate the **PowerPivot add-in** is to just insert a **PowerView** sheet from the Ribbon. This will automatically create an empty Data Model, insert a blank **PowerView** canvas and activate the PowerPivot Ribbon.

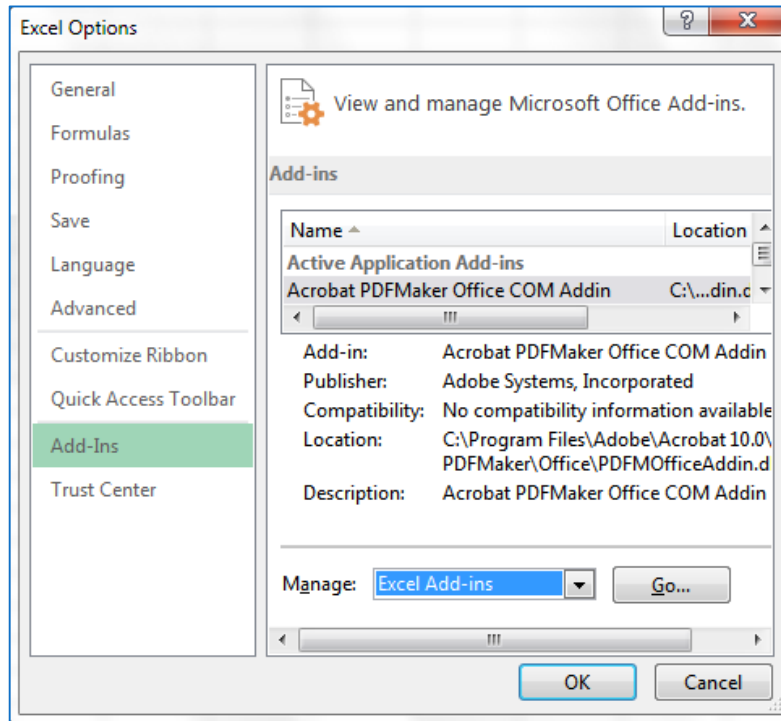


Power  
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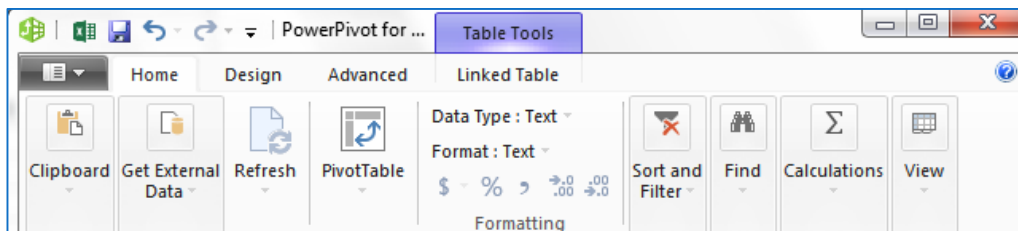
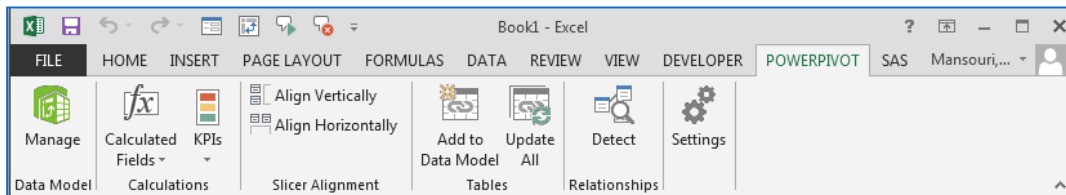
## To Enable PowerPivot

- From the **FILE** menu, click **Options** -> select **Add-Ins**.
- In the **Manage:** box, click **COM Add-ins** -> **Go...**
- Check the **Microsoft Office PowerPivot for Excel 2013** box, and then click **OK**. After you install **PowerPivot**, you see a POWERPIVOT tab on the Ribbon.
- Clicking the **POWERPIVOT tab** displays the options available.
- Clicking the **Manage in Data Model** group, opens the **PowerPivot Window**.

## PowerPivot for Excel 2013



After successfully enabling PowerPivot, the **POWERPIVOT** tab should appear in Excel ribbon.



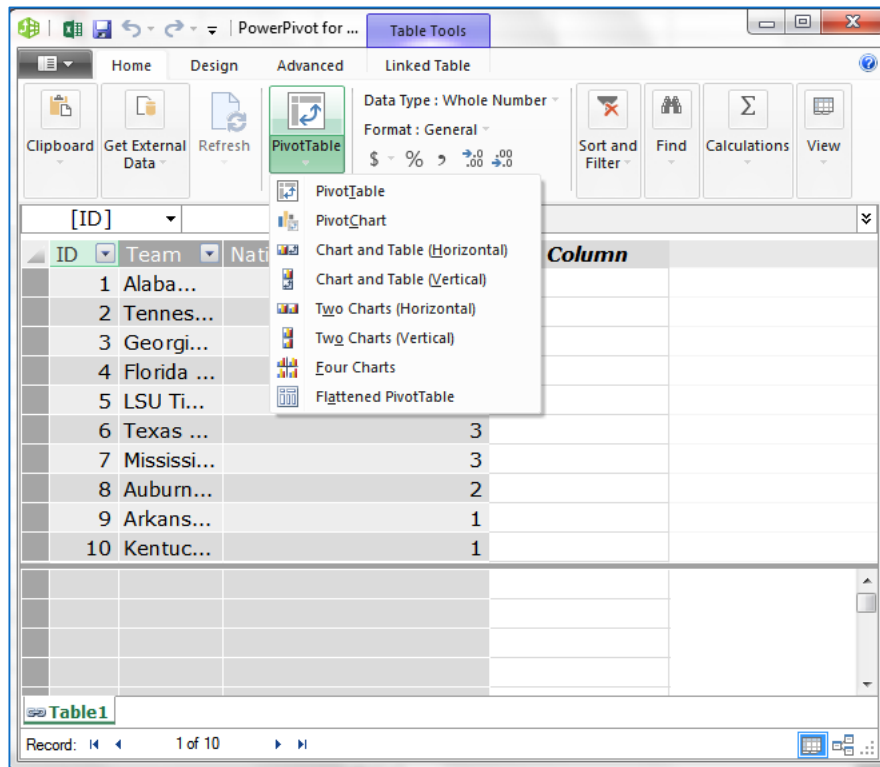
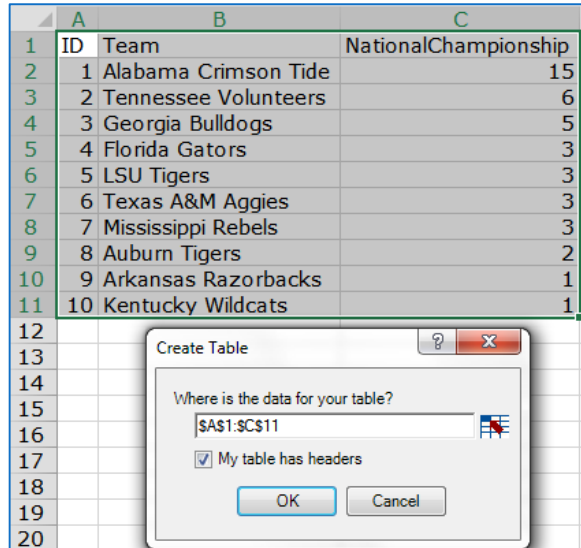
**Example:** Adapted from <http://www.mssqltips.com/sqlservertip/2868/powerpivot-with-excel-2013> accessed on 9/26/2013.

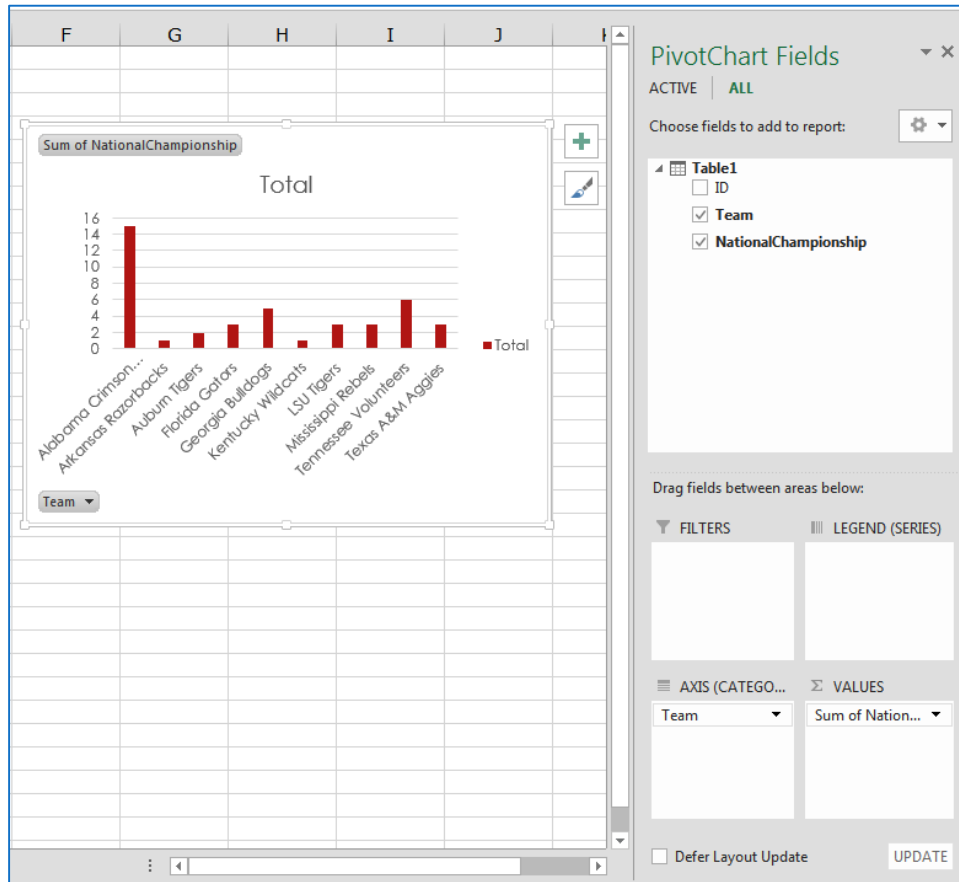
Suppose that you have run a query and copied/pasted your results into the Excel spreadsheet. And suppose that the query results look like this:

<b>ID</b>	<b>Team</b>	<b>NationalChampionship</b>
1	Alabama Crimson Tide	15
2	Tennessee Volunteers	6
3	Georgia Bulldogs	5
4	Florida Gators	3
5	LSU Tigers	3
6	Texas A&M Aggies	3
7	Mississippi Rebels	3
8	Auburn Tigers	2
9	Arkansas Razorbacks	1
10	Kentucky Wildcats	1

- Select your data -> click the **PowerPivot** tab -> click **Add to Data Model**. On the create table dialog box, make sure you select the range for your data and click "**My table has headers**" check box.
- After clicking OK, the PowerPivot window should appear.
- Click **PivotTable** -> **PivotChart**, and then select **New Worksheet**.
- In a graph, to see each **Team** and how many **National Championships** they have won click on the **PivotChart**, and the **PivotChart Fields**. The list should appear on the right side. If the Field list doesn't appear, right click in the Chart and select **Show Field List**.
- Drag **Team** to the **AXIS** box and drag **NationalChampionships** to the **VALUES** box. This indicates that you will be reporting on each team with the number of National Championships being the value you want to show.


# PowerPivot for Excel 2013



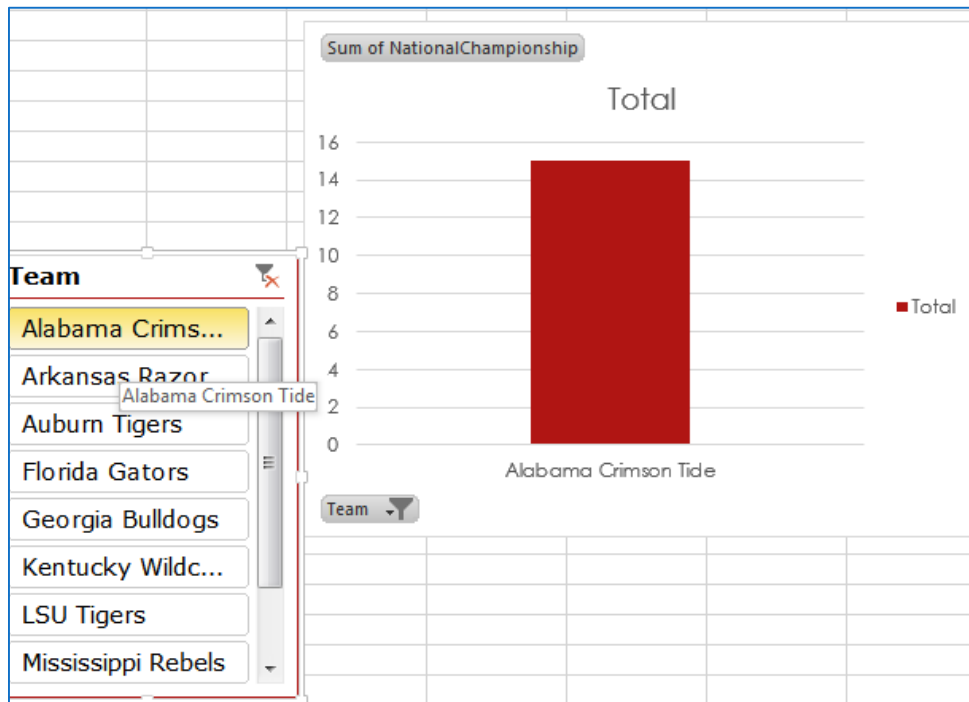
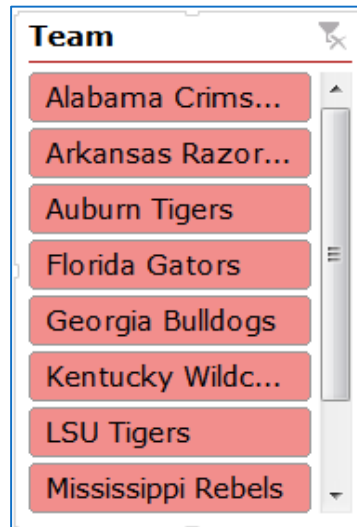
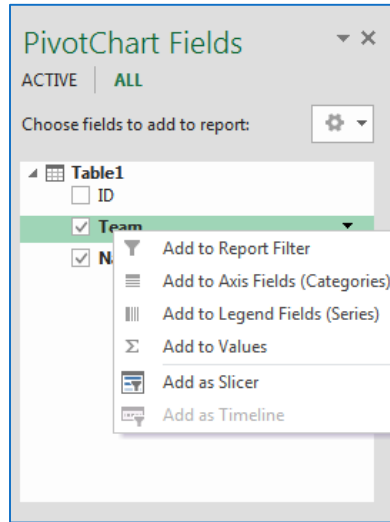


### To Add a Slicer to your Graph

To choose between which teams to display:

- While PivotChart is selected, using the **PIVOTCHART TOOLS** -> on **ANALYZE** tab -> **Insert Slicer** (or right-click on **Team** field -> **Add As Slicer**)
- Now, if you click on a team in the slicer, for example, **Alabama Crimson Tide**, you will notice it shows results for only Alabama Crimson Tide.
- You can also **CTRL + Click** to select multiple teams or click the  button to set the slicer back to default.

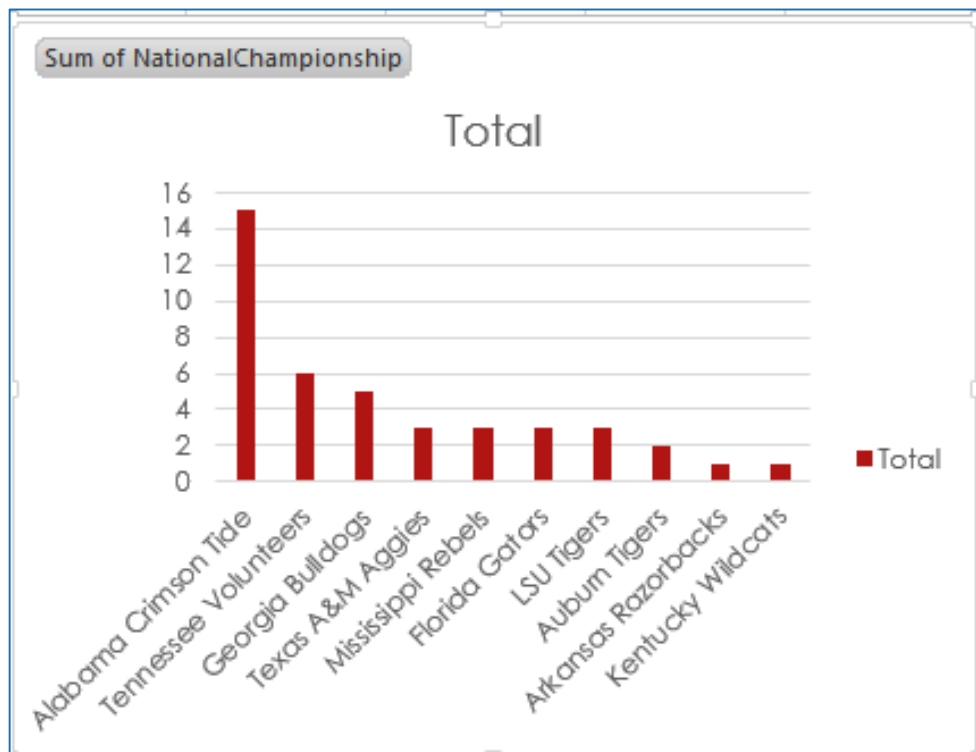
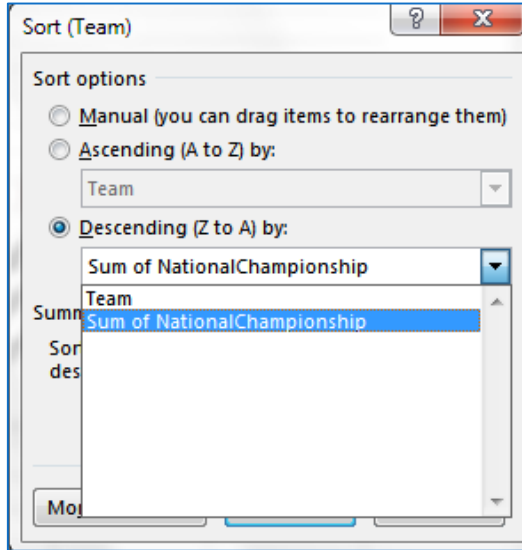




### To change Order of Chart Results

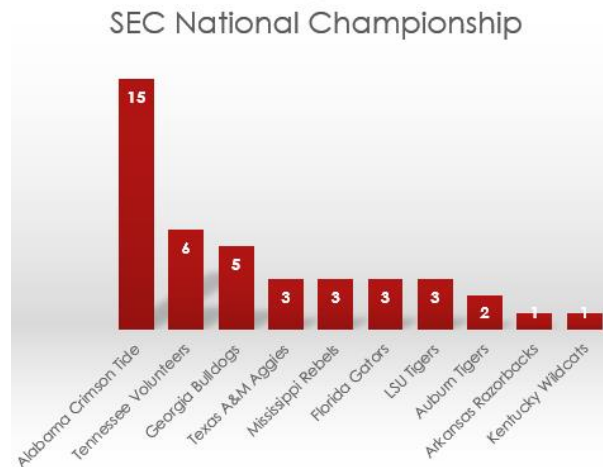
By default the graph puts the teams in alphabetical order. To change the graph to display the National Championships in order:

- Click the down arrow beside **Team** (on the PivotChart Fields Pane on the right, or on the graph) and click **More Sort Options...**
- Change the Sort to **Descending** (Z to A) by: and select **Sum of NationalChampionships**.



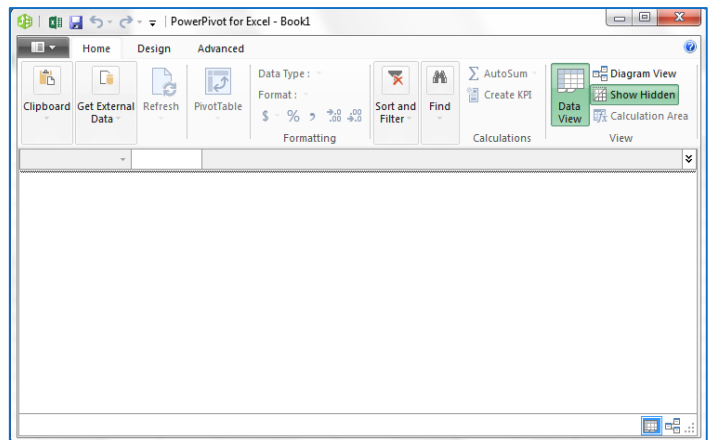
### To Change chart title and remove Legend and unwanted field buttons

- Click on the title and rename it **SEC National Championship**.
- Click the chart legend, and **Delete**.
- To hide the field buttons, right-click the button and select **“Hide Buttons”**
- To change the color of the bars in the graph or style of the graph, click on the chart and select the **Design** tab under **PivotChart Tools**.



### To Open the PowerPivot window

- Click the **PowerPivot** tab. This is the tab where you work with **PowerPivot, PivotTables, Calculated Fields**, and creating **linked tables**.
- Click **Manage** (in Data Model group). Now you're in the **PowerPivot window**. Here you can click **Get External Data** to use the **Table Import Wizard** to filter data as you add it to your file, **create relationships** between tables, perform calculations and expressions, and then use this data to create **PivotTables** and **PivotCharts**.



## PivotTable data analysis using a Data Model in Excel 2013

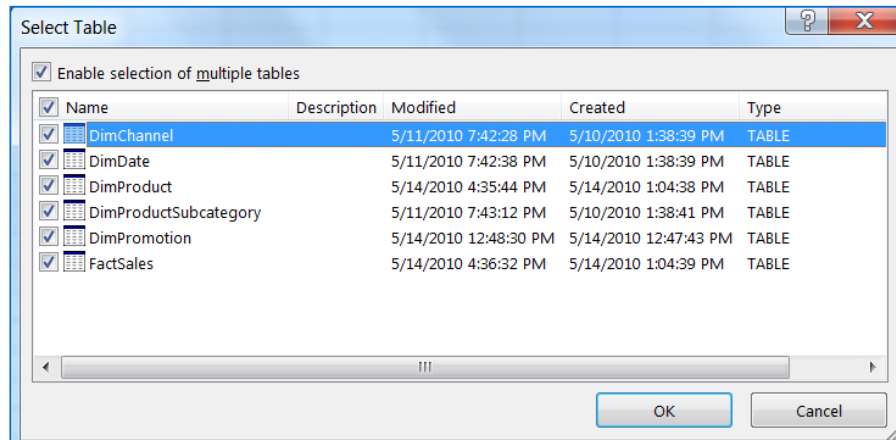
To build a **PivotTable report** in Excel that combines data from multiple tables, we will import several tables and then use the **PowerPivot add-in** to refine the data model that lives behind the report learning how to add calculations to our report.

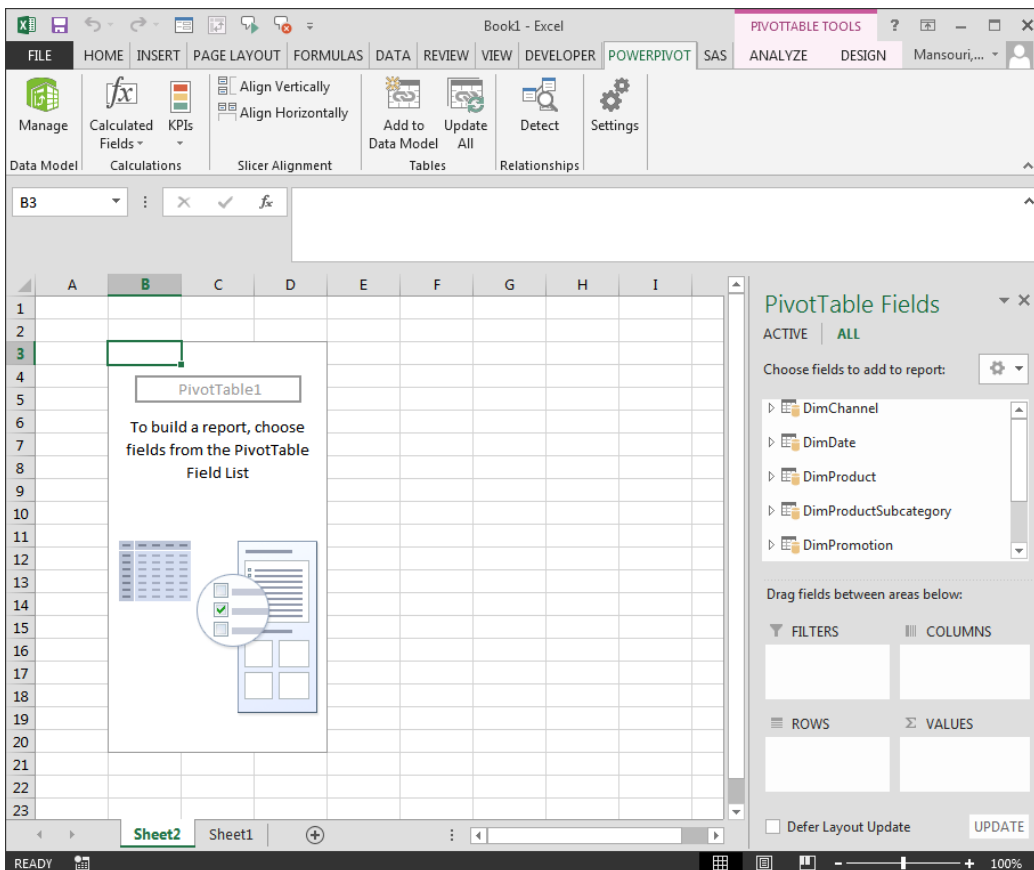
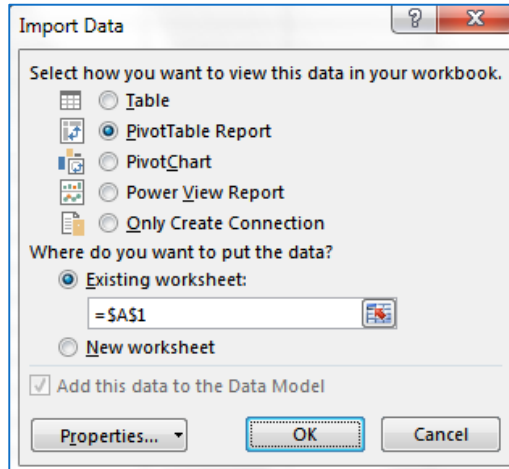
We will use **PowerPivot Sample Data** available for download @

<http://powerpivotsdr.codeplex.com>

### To Import Data

- In Excel, open a blank workbook.
- Click **Data** tab-> **Get External Data** (drop-down list)-> **From Database -> From Access**
- Go to the folder that contains the **Sample Data** files and select **ContosoSales** (in the ShortCourses folder)
- Click **Open**. Because you are connecting to a database file that contains multiple tables, the **Select Tables** dialog appears so that you can choose which tables to import.
- Check **Enable selection of multiple tables'** box, to select all tables -> check the **Name** box -> click **OK twice**, to create a PivotTable Report (this may take some time). You just created a data model (implicit). The model is a data integration layer that is created automatically when you import or work with multiple tables simultaneously in the same PivotTable report. Now you can view and modify this model using the **PowerPivot**.



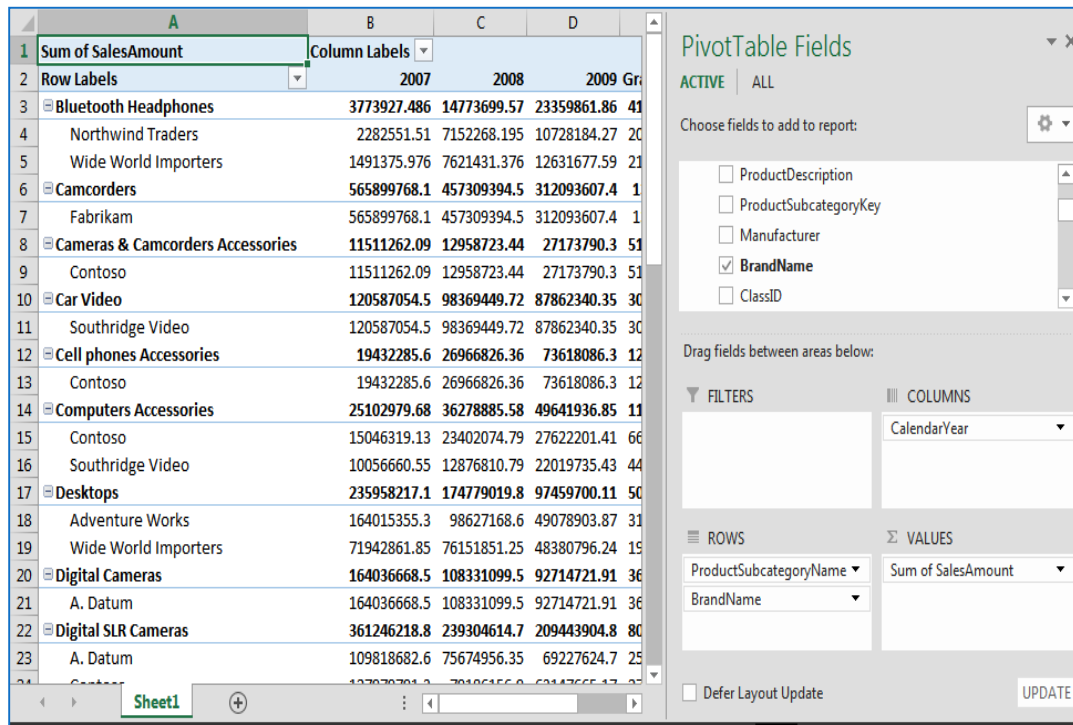


### Exploring Data Using a PivotTable

Now you can explore data by dragging **PivotTable Fields** to the **Values**, **Columns**, and **Rows** areas on the **PivotTable Fields** list.

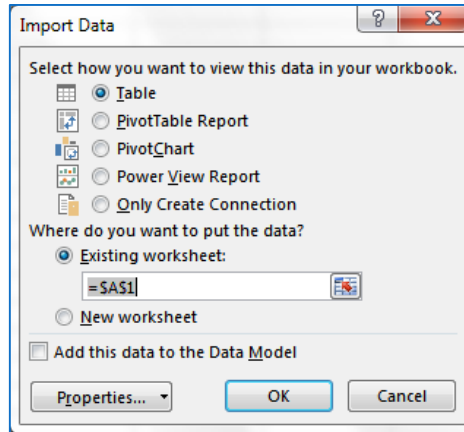
- In the **PivotTable Fields** list scroll down until you find the **FactSales** table.

- Expand the table, and then click **SalesAmount** field. Because this data is numeric, Excel automatically places **SalesAmount** in the **Values** area.
- From the **DimDate** table, drag **CalendarYear** field to **Columns**.
- From **DimProductSubcategory** table, drag the **ProductSubcategoryName** field to **Rows**.
- From **DimProduct** table, drag the **BrandName** field to Rows, placing it beneath **ProductSubcategoryName**. You now have a basic PivotTable that includes fields from four different tables. **Note:** Because the tables that you imported had pre-existing relationships among the tables, Excel recreated those relationships in the model.



### Adding ProductCategories Table to the Model

- In the workbook open a new Worksheet, to store additional data.
- Click **Data** -> **Get External Data** -> **From Access**.
- Go to the folder that contains the **Sample Data** files and select **ProductCategories**.
- Click **Open**.
- In **Import Data** dialog box, select **Table** radio button, and click **OK**.



	A	B	C	D	E	F	G
1	ProductCategoryKey	ProductCategoryLabel	ProductCategoryName	ProductCategoryDescription	ETLLoadID	LoadDate	UpdateDate
2	1 01	Audio	Audio	Audio	1	7/7/2009	7/7/2009
3	2 02	TV and Video	TV and Video	TV and Video	1	7/7/2009	7/7/2009
4	3 03	Computers	Computers	Computers	1	7/7/2009	7/7/2009
5	4 04	Cameras and camcorders	Cameras and camcorders	Cameras and camcorders	1	7/7/2009	7/7/2009
6	5 05	Cell phones	Cell phones	Cell phones	1	7/7/2009	7/7/2009
7	6 06	Music, Movies and Audio Books	Music, Movies and Audio Books	Music, Movies and Audio Books	1	7/7/2009	7/7/2009
8	7 07	Games and Toys	Games and Toys	Games and Toys	1	7/7/2009	7/7/2009
9	8 08	Home Appliances	Home Appliances	Home Appliances	1	7/7/2009	7/7/2009

### Adding Geography data to the Model

- Insert another worksheet.
- From the **Sample Data** files, open **Geography.xlsx**
- Place the cursor in **A1**, and then press **Ctrl-Shift-End** to select all of the data.
- **Copy** the data to the clipboard.
- **Paste** the data into the empty worksheet you just added (Don't Deselect it).
- Click **Format as Table** (HOME -> Styles), choosing any style. In **Format As Table**, verify that **My table has headers** is selected -> click **OK**. Formatting the data as a table lets you name it, which will come in handy when you define relationships in a later step.
- Name the table **Geography**. In **Table Tools -> Design**, type **Geography** in **Table Name**.
- **Close** Geography.xlsx to clear it from your workspace.

### Adding Stores data to the Model

Repeat the previous steps for the **Stores.xlsx** file, pasting its contents into an empty sheet. Name the table **Stores**.

- Insert another worksheet.

- From the **Sample Data** files, open **Stores.xlsx**, place the cursor in **A1**, and then press **Ctrl-Shift-End** to select all of the data.
- **Copy** the data to the clipboard.
- **Paste** the data into the empty worksheet you just added (Don't Deselect it).
- Click **Format as Table** (HOME -> Styles), choosing any style.
- In **Format As Table**, verify that **My table has headers** is selected -> click **OK**.
- Name the table **Store**. In **Table Tools** -> **Design**, type **Store** in **Table Name**.
- **Close** Stores.xlsx to clear it from your workspace.

You should now have **four worksheets**:

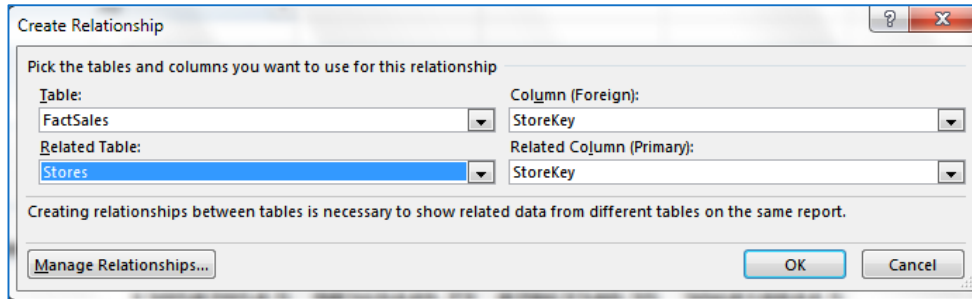
- **Sheet1** contains the **PivotTable**;
- **Sheet2** contains **ProductCategories** data table;
- **Sheet3** contains **Geography** data table; and
- **Sheet4** contains **Stores** data table.

### Using Fields from the Newly Imported Tables, to create a PivotTable

- On **Sheet1**, at the top of **PivotTable Fields**, click **All** to view the complete list of available tables.
- Scroll to the bottom of the list. That's where you'll find the new tables you just added.
- Expand the **Stores** table.
- Drag **StoreName** to the **Filters** area. **Notice** that Excel prompts you to create a relationship. This notification occurs because you've used fields from a table that is unrelated to the model.
- Click **Create** to open the **Create Relationship** dialog.
- Under **Table:** choose **FactSales** (from the drop-down list). In the sample data you're using, FactSales contains detailed sales and cost information about Contoso's business, as well as keys to other tables, including store codes that are also present in the **Stores.xlsx** file you imported in the previous step.
- Under **Column (Foreign):** choose **StoreKey** (from drop-down list).
- Under **Related Table:** choose **Stores** (from drop-down list).

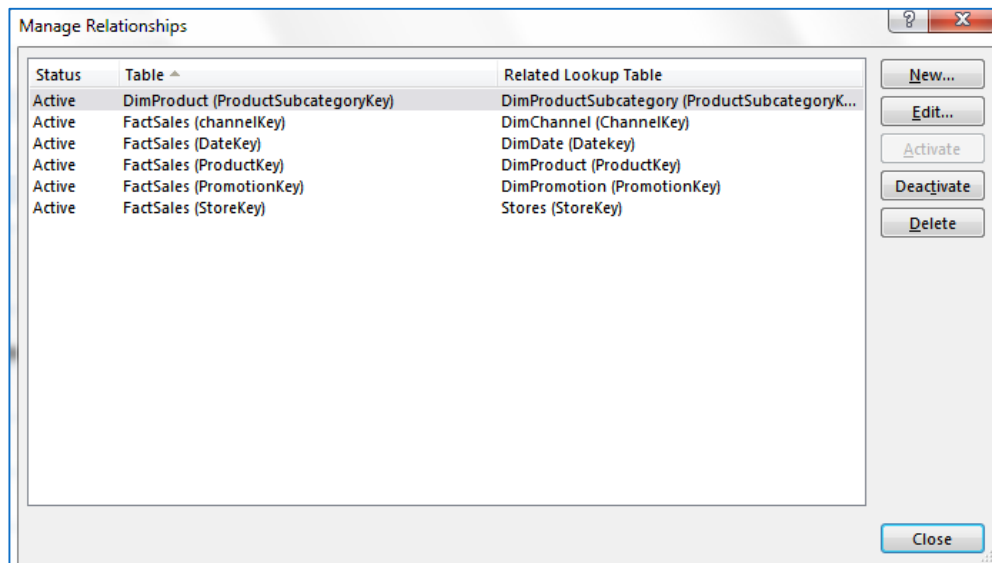


- Under **Related Column (Primary)**: choose **StoreKey** (from drop-down list).
- Click **OK**. **Note:** Behind the scenes, Excel is building a **Data Model** that can be used throughout the workbook in any number of **PivotTables**, **PivotCharts**, or **Power View reports**. Fundamental to this model are **table relationships** that determine navigation and calculation paths used in a PivotTable report.



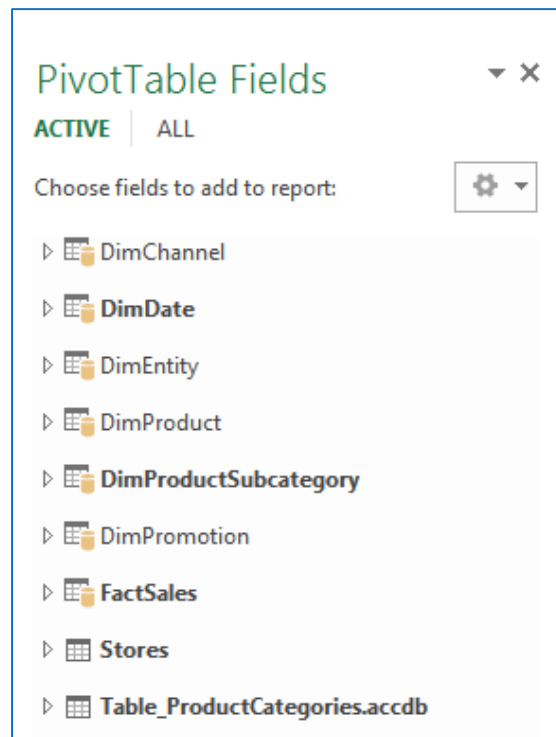
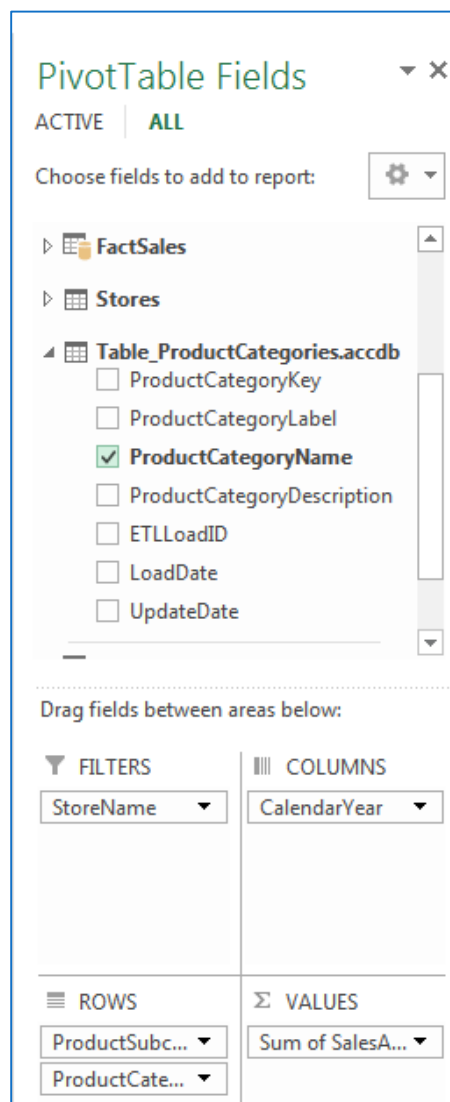
### Adding Relationships Manually to Relate ProductSubcategory to ProductCategory

- In Excel, click **Data -> Relationships -> New**.
- Under **Table**: choose **DimProductSubcategory**.
- Under **Column (Foreign)**: choose **Table\_ProductCategoryKey.accd**
- Under **Related Table**: choose **Table\_ProductCategories.accbd**.
- Under **Related Column (Primary)**: choose **ProductCategoryKey**.
- Click **OK**.
- Close the **Manage Relationships** dialog.



### Adding ProductCategories table to the PivotTable

- In **PivotTable Fields**, click **All** to show tables that exist in the Data Model.
- Scroll to the bottom of the list.
- In the **Rows** area, remove **BrandName**.
- Expand **Table\_ProductCategories.accdb** table.
- Drag **ProductCategoryName** to the **Rows** area, placing it *above* **ProductSubcategory**.
- In **PivotTable Fields**, click **Active** to verify that the tables you just used are now actively used in the PivotTable.



### **Adding a Relationship using Diagram View in PowerPivot**

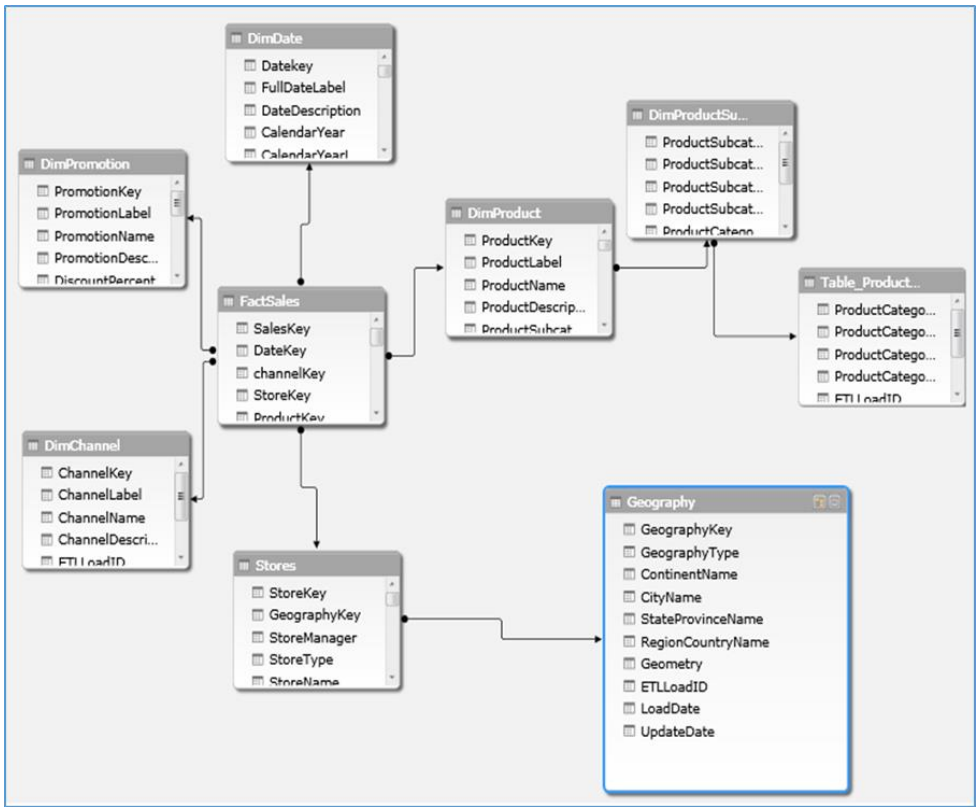
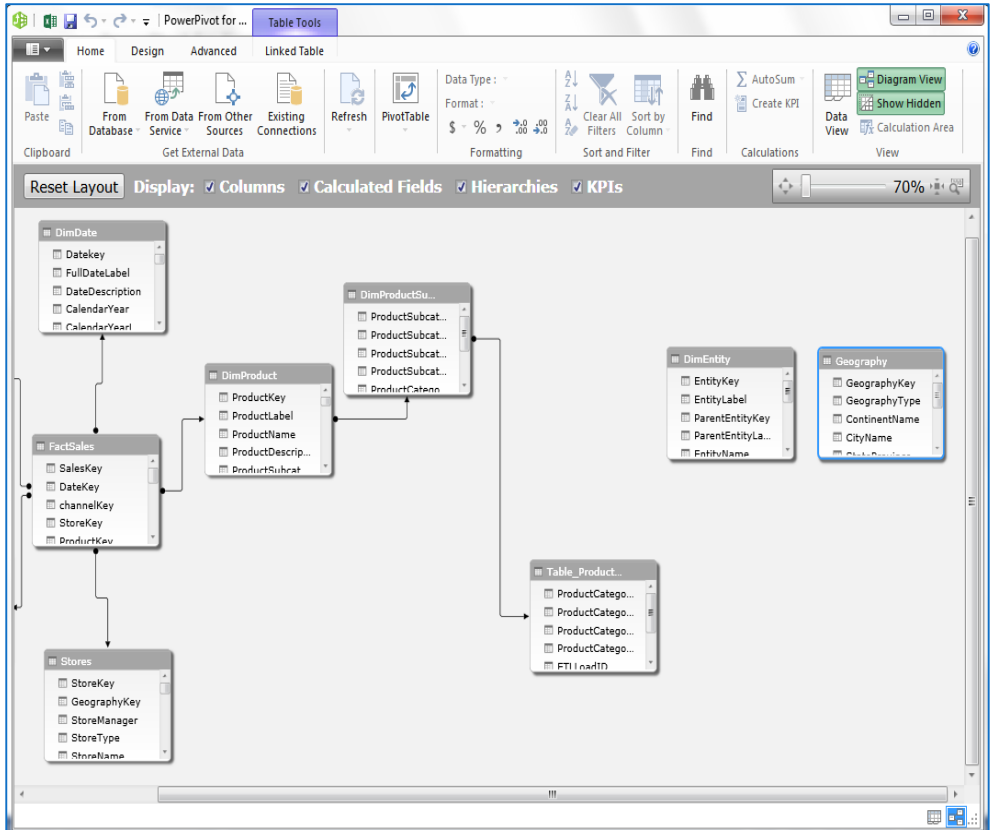
- In Excel, click **Sheet3** to make it the active sheet. Sheet3 contains the **Geography** table you imported earlier. Click in a cell.
- On the ribbon, click **PowerPivot** -> **Add to Data Model** -> check the box for **My table has headers** -> click **OK**. This step adds the Geography table to the model. It also opens the **PowerPivot add-in**. **Notice** that the PowerPivot window shows all the tables in the model, including Geography (at the bottom of the window). Click through a couple of tables. In the add-in, you can view all of the data that your model contains.
- In the **PowerPivot window**, in the **View** group (on the **HOME** tab), click **Diagram View**. Use the slide bar to resize the diagram so that you can see all objects in the diagram (to the right).
- Zoom in on Geography so that you can view all of its fields (right-click -> maximize). You can use the slider to make the table diagram bigger. **Notice** **Geography** has **GeographyKey**. This column contains values that uniquely identify each row in the Geography table.
- While the Relationships window is open (Diagram View), to find out if other tables in the model also use this key, click **Find**.
- In **Find Metadata**, type **GeographyKey**.
- Click **Find Next** several times. You'll notice the **GeographyKey** shows up in the **Geography** table and in the **Stores** table. **Close** the **Find** dialog box.
- Reposition the **Geography** table so that it is next to **Stores** table. Drag the **GeographyKey** column in **Stores** to the **GeographyKey** column in **Geography**. PowerPivot draws a line between the two columns, indicating the relationship.

# PowerPivot for Excel 2013

GeographyKey	GeographyType	ContinentName	CityName	StateProvinceName	RegionCountryName	Geometry
1	Continent	Asia				00
2	Continent	Europe				00
3	Continent	North America				00
269	Country/Region	Asia			Armenia	00
270	Country/Region	Asia			Australia	03
271	Country/Region	Asia			Bhutan	C9
272	Country/Region	Asia			China	00
273	Country/Region	Asia			India	10
274	Country/Region	Asia			Iran	00
275	Country/Region	Asia			Japan	00
276	Country/Region	Asia			Kyrgyzstan	40
277	Country/Region	Asia			Pakistan	EE
278	Country/Region	Asia			Singapore	
279	Country/Region	Asia			South Korea	
280	Country/Region	Asia			Syria	0F
281	Country/Region	Asia			Taiwan	65
282	Country/Region	Asia			Thailand	F4
283	Country/Region	Asia			Turkmenistan	40
284	Country/Region	Europe			Denmark	00
285	Country/Region	Europe			France	40

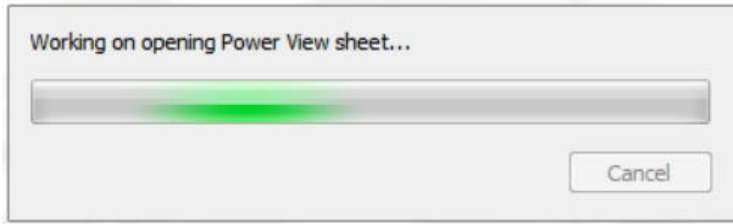
GeographyKey	GeographyType	ContinentName	CityName	StateProvinceName	RegionCountryName	Geometry	ETLLoadID	LoadDate	UpdateDate
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# PowerPivot for Excel 2013



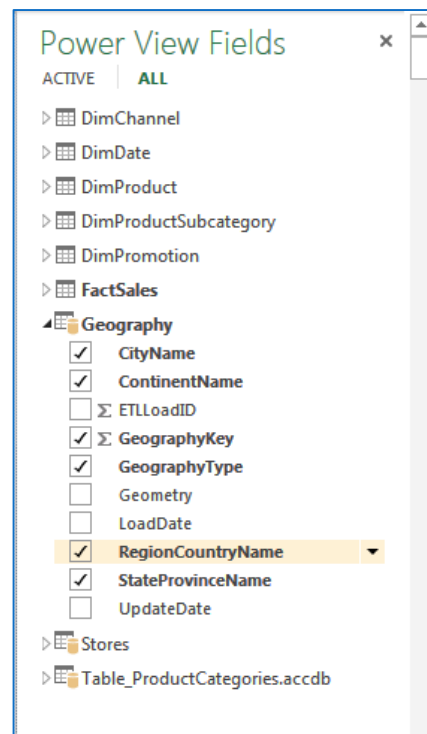
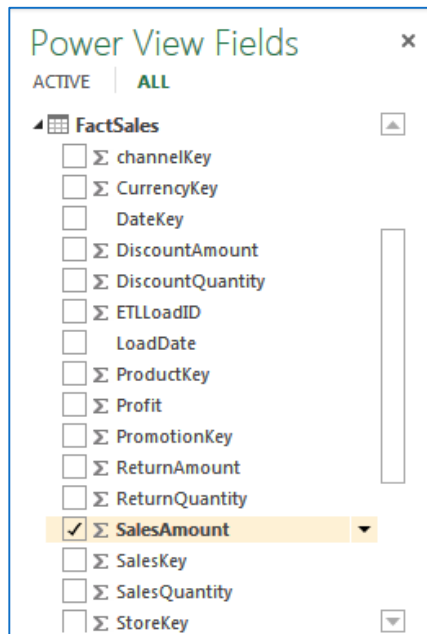
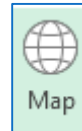
## Creating a Power View report

Opening Power View



PivotTable reports are not the only type of report that benefits from a **Data Model**. Using the same model you just built, you can add a **Power View sheet** to try out some of the layouts it provides.

- In Excel, click **Insert** -> **Power View**.
- In **Power View Fields**, click the **arrow** next to the **FactSales** table, and click **SalesAmount** (click ALL to see all tables).
- Expand the **Geography** table and click **RegionCountryName**.
- In the ribbon, click **Map** (Design tab -> Switch visualization). A map report appears.
- Drag a corner to resize it. On the map, blue circles of varying size indicate sales performance for different countries or regions.





### Recommended Online Resources

- Online **Video Training Library** <http://library.ttu.edu/lynda>
- **Safari eBooks Online** <http://library.ttu.edu>
  - **Excel 2013 In Depth**, by: Bill Jelen, January 24, 2013
  - **Excel 2013 Pivot Table Data Crunching**, by: Michael Alexander, January 16, 2013
  - **Microsoft Excel 2010: Data Analysis and Business Modeling**, 3rd Edition, by: Wayne L. Winston, January 7, 2011

Please e-mail your questions, **comments**, or suggestions to [heide.mansouri@ttu.edu](mailto:heide.mansouri@ttu.edu)