



Dashboard in a Day – Lab 1

Accessing & Preparing Data

by Power BI Team, Microsoft



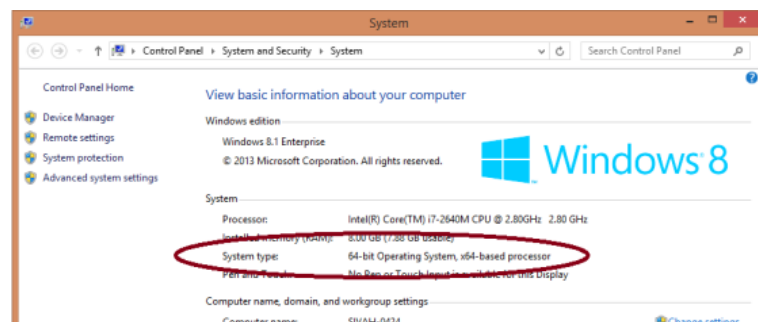
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Lab Prerequisites

Following prerequisites and setup must be complete for successful completion of the exercise:

- You must be connected to the internet.
- You must have Microsoft Office installed.
- **Signup for Power BI:** Go to <http://aka.ms/pbidiadtraining> and sign up for Power BI with a business email address. If you cannot sign up for Power BI, let the instructor know. If you have an existing account, please use the same url as above.
- At minimum, a computer with 2-cores and 4GB RAM running one of the following versions of Windows: Windows 8 / Windows Server 2008 R2, or later.
- If you choose to use Internet Explorer it will require version 10 or greater, you can also use Edge or Chrome.
- Verify if you have 32-bit or 64-bit operating system to decide if you need to install the 32-bit or 64-bit applications.
 - Search for computer on your PC, right click properties for your computer.
 - You will be able to identify if your operating system is 64 or 32 bit based on “system type” as shown below.



- **Download the Power BI Content:** Create a folder called **DIAD** on the C drive of your local machine. Copy all contents from the folder called **Dashboard in a Day Assets** to the **DIAD** folder you just created (C:\DIAD).
- **Download and install Power BI Desktop** using any one of the options listed below:
 - If you have Windows 10, use Microsoft App Store to download and install Power BI Desktop app.
 - Download and install Microsoft Power BI Desktop from <http://www.microsoft.com/en-us/download/details.aspx?id=45331>.
 - If you already have Power BI Desktop installed ensure you have the **latest version** of Power BI downloaded.
- **Download and install Power BI Mobile App on your mobile device**
 - If you are using an Apple product download and install the Microsoft Power BI Mobile app from the Apple store or this link <https://apps.apple.com/us/app/microsoft-power-bi/id929738808>
 - If you are using an Android product download and install the Microsoft Power BI Mobile app from the Google Play store or this link <https://play.google.com/store/apps/details?id=com.microsoft.powerbim>

Document Structure

This document and the documents that follow have two main sections:

- **Power BI Desktop:** This section highlights the features available in Power BI Desktop and walks the user through the process of bringing in data from the data source, modeling and creating visualizations.
- **Power BI Service:** This section highlights the features available in Power BI Service including the ability to publish the Power BI Desktop model to the web, creating and sharing dashboard and Q & A.

The document flow is in a table format. On the left panel are steps the user needs to follow and in the right panel are screenshots to provide a visual aid for the users. In the screenshots, sections are highlighted with red boxes to highlight the action/area user needs to focus on.

Users should use their file from Lab 1 through Lab 5. The solutions provided for each lab are a final product to reference. The solutions are not meant to be the starting point for each lab.

NOTE: This lab is using real anonymized data and is provided by ObviEnce LLC. Visit their site to learn about their services: www.obvience.com.

This data is property of ObviEnce LLC and has been shared for the purpose of demonstrating Power BI functionality with industry sample data. Any uses of this data must include this attribution to ObviEnce LLC.

Overview

Introduction

Today you will be learning various key features of the Power BI service. This is an introductory course intended to teach how to author reports using Power BI Desktop, create operational dashboards and share content via the Power BI Service.

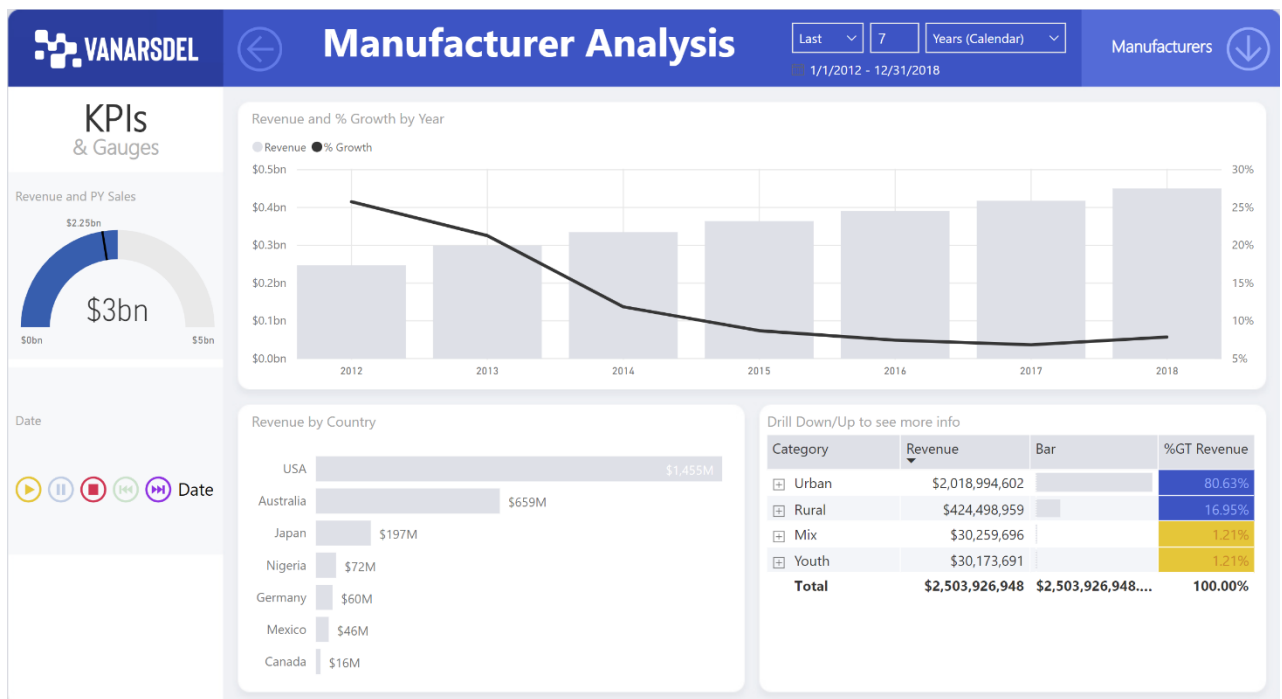
At the end of this lab you will have learned how to load data from excel and csv sources. You will learn how to manipulate the data to prepare it for reporting. You will have prepared the tables in Power Query and loaded it into the model, so it is ready for reporting in lab 2.

Data Set

The dataset you will use today is a sales and market share analysis. This type of analysis is very common for the office of a Chief Marketing Officer (CMO). Unlike the office of the Chief Financial Officer (CFO), a CMO is focused not only on company's performance internally (how well do our products sell) but also externally (how well do we do against the competing products).

The company, VanArsdel, manufactures expensive retail products that could be used for fun as well as work and it sells them directly to consumers nationwide as well as in several other countries.

By the end of the class, you will build a report which will look like the screenshot below. Office of the CMO can use this report to analyze VanArsdel's performance.



Power BI Desktop

Power BI Desktop – Accessing Data

In this section, you will import VanArsdel and its competitors USA sales data. Then you will import and merge sales data from other countries.

Power BI Desktop - Get Data

Let's start with looking at the data files. The dataset contains sales data of VanArsdel and other competitors. We have 7 years of transaction data by day, product and zip code for each manufacturer. We are going to analyze data from 7 countries.

USA sales data is in a csv file located in /Data/USSales folder.

Sales of all other countries is in /Data/InternationalSales folder. Each country's sales data is in a csv file in this folder.

Product, Geography and Manufacturer information is in an excel file in /Data/USSales/bi_dimensions.xlsx.

1. Open

/Data/USSales/bi_dimensions.xlsx.

Notice the first sheet has **Product** information. The sheet has a header and product data is in a named table. Also notice Category column has a bunch of empty cells.

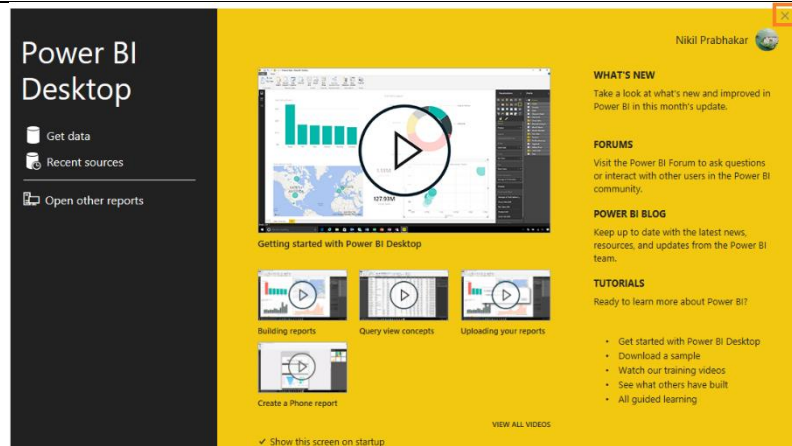
Manufacturer sheet has data laid out across the sheet and with no column headers and it has a couple of blank rows and a note in row 7.

Geo sheet has geography information. The first couple of rows has data details. Actual data starts from row 4. We will start by connecting to data from these different files and perform data cleaning and transformation operations.

	A	B	C	D	E	F
1	Source:	Public Database				
2	Last Update:	Monday, February 1, 2016				
3						
4	Zip	City	State	Region	District	Country
5	22654	Star Tannery, VA, USA	VA	East	District #07	USA
6	22655	Stephens City, VA, USA	VA	East	District #07	USA
7	22656	Stephenson, VA, USA	VA	East	District #07	USA
8	22657	Strasburg, VA, USA	VA	East	District #07	USA
9	22660	Toms Brook, VA, USA	VA	East	District #07	USA
10	22663	White Post, VA, USA	VA	East	District #07	USA
11	22664	Woodstock, VA, USA	VA	East	District #07	USA
12	22701	Culpeper, VA, USA	VA	East	District #07	USA
13	22709	Aroda, VA, USA	VA	East	District #07	USA
14	22711	Banco, VA, USA	VA	East	District #07	USA
15	22712	Banco, VA, USA	VA	East	District #07	USA

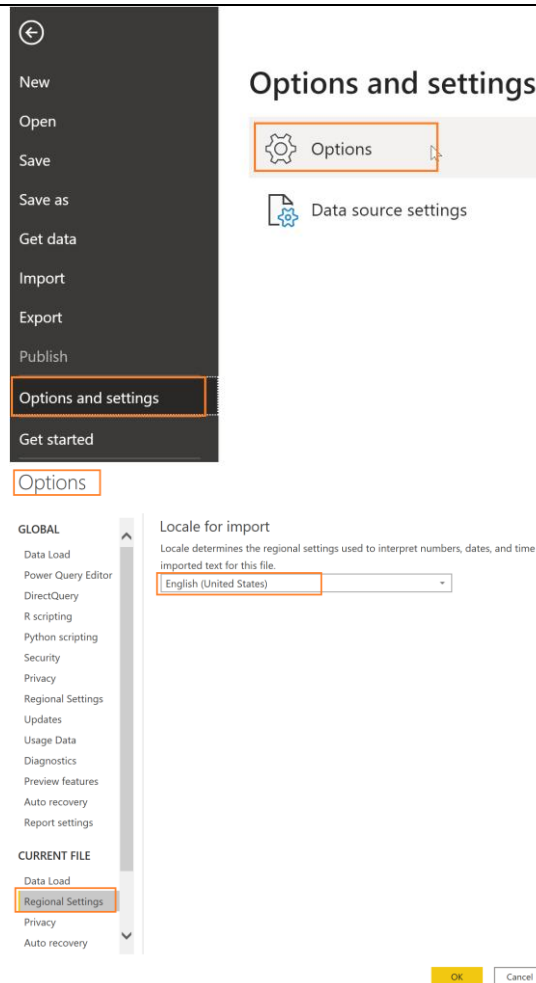
product | manufacturer | geo

2. If you don't have the **Power BI Desktop** open, launch it now.
3. Select **Already have a Power BI Account? Sign in** option.
4. **Sign in** using your Power BI credentials.
5. Startup screen opens. Click on **X** on the top right corner of the dialog to close it.



Let's set up the locale to US English, to make it convenient to go through the rest of this lab.

6. From the ribbon, select **File -> Options and settings -> Options**.
7. In the left panel of Options dialog, select **Regional Settings**.
8. From the **Locale** drop down select **English (United States)**.
9. Select **OK** to close the dialog.



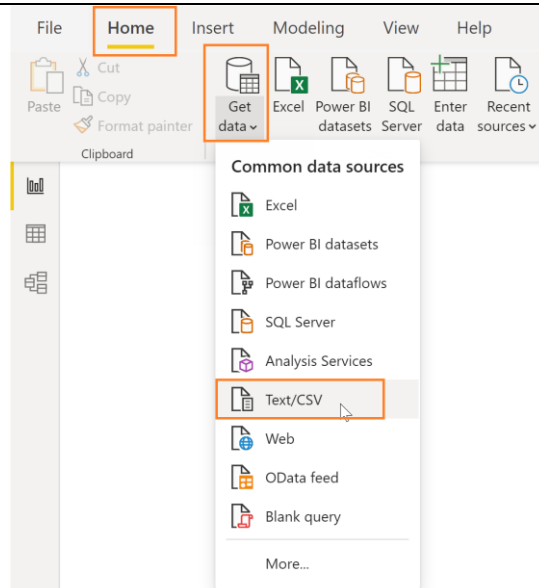
First step is to load data to Power BI Desktop. We will load USA Sales data which is in comma separated value (CSV) files.

10. From the ribbon, select **Home** -> **Get Data** drop down arrow.

11. Select **Text/CSV**.

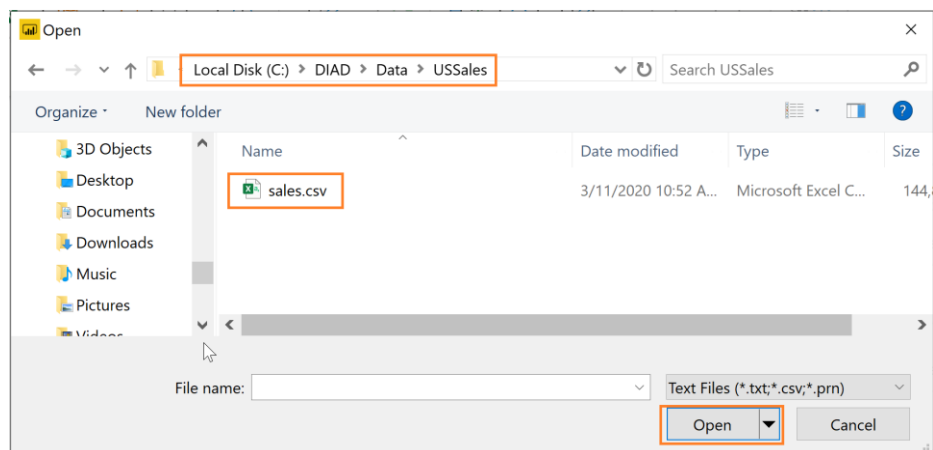
Note: Power BI Desktop has the capability to connect to 300+ data sources. We are using csv and excel data files in this lab for simplicity. If you would like a full list of data sources please use this link:

<https://docs.microsoft.com/en-us/power-bi/connect-data/desktop-data-sources>



12. Browse to **DIAD\Data\USSales** folder and select **sales.csv**.

13. Click **Open**.

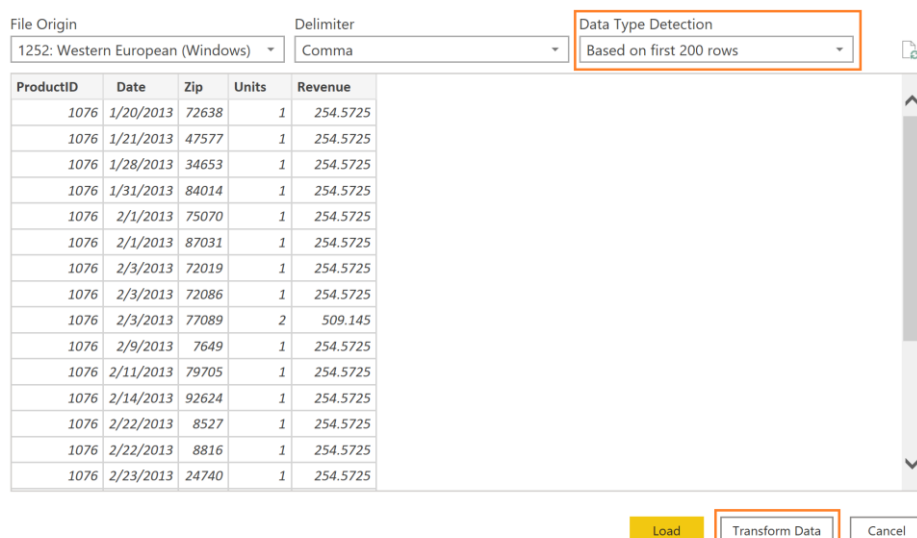


Power BI detects the data type of each column. There are options to detect the data type based on the first 200 rows or based on the entire dataset or not detect it. Since our dataset is large and it will take time and resources to scan the complete data set, let's leave the default option of selecting dataset based on the first 200 rows.

After completing your selection, you have three options – Load, Edit or Cancel.

- **Load**, loads the data from the source into Power BI Desktop for you to start creating reports.
- **Transform Data** allows you to perform data shaping operations

sales.csv



such as merging columns, adding additional columns, changing data types of columns as well as bringing in additional data.

- **Cancel** gets you back to the main canvas.

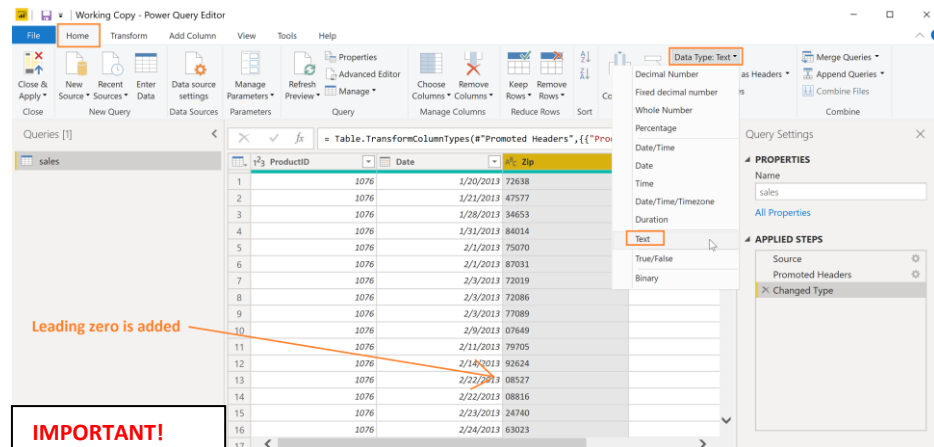
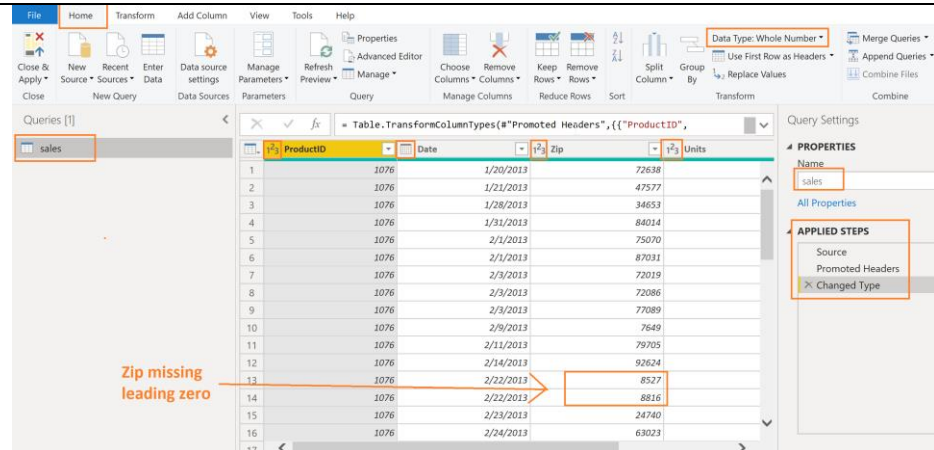
14. Click **Transform Data** as shown in the screenshot. A new window opens.

You should be in the Query Editor window as shown in the screenshot to the right. Query Editor is used to perform data shaping operations. Notice the sales file you connected to shows as a query in the left panel. You see a preview of the data in the center panel. Power BI predicts data type of each field (based on the first 200 rows) which is indicated next to the column header. In the right panel, steps that Query Editor performs are recorded.

Note: You will be bringing in sales data from other countries as well as performing certain data shaping operations.

15. Notice Power BI has set Zip field to data type Whole Number. To ensure that Zip codes which start with zero don't lose the leading zero, we will format them as text. Highlight the **Zip** column. From the ribbon, select **Home -> Data Type** and update it to **Text**.

16. **Change Column Type** dialog opens. Select **Replace Current** button which overwrites Power BI's predicted datatype.

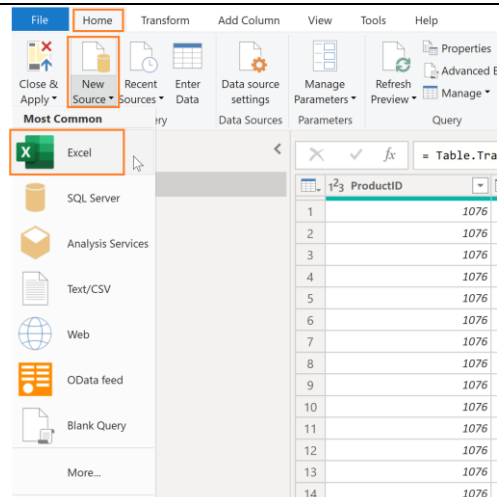


IMPORTANT!

Changing the data type is a big deal to use later

Now let's get the data that is in excel source file.

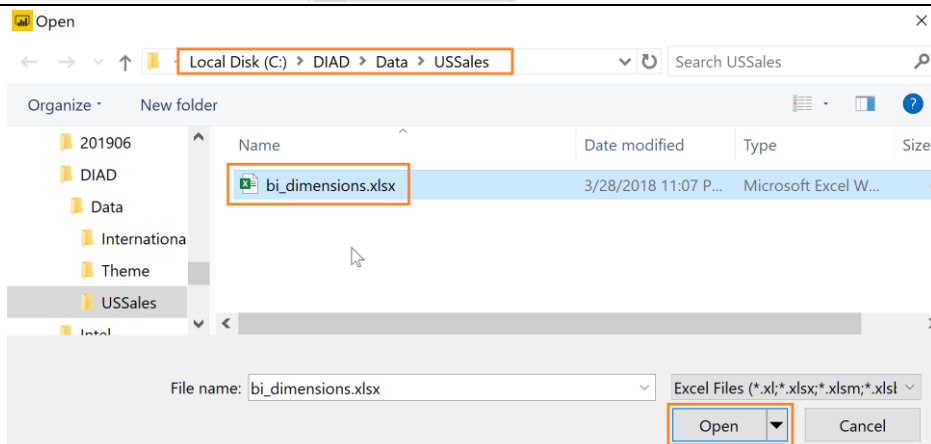
17. From the ribbon, select **Home -> New Source -> Excel**.



18. Browse to **DIAD\Data\USSales** folder and select **bi_dimensions.xlsx**.

19. Click **Open**.

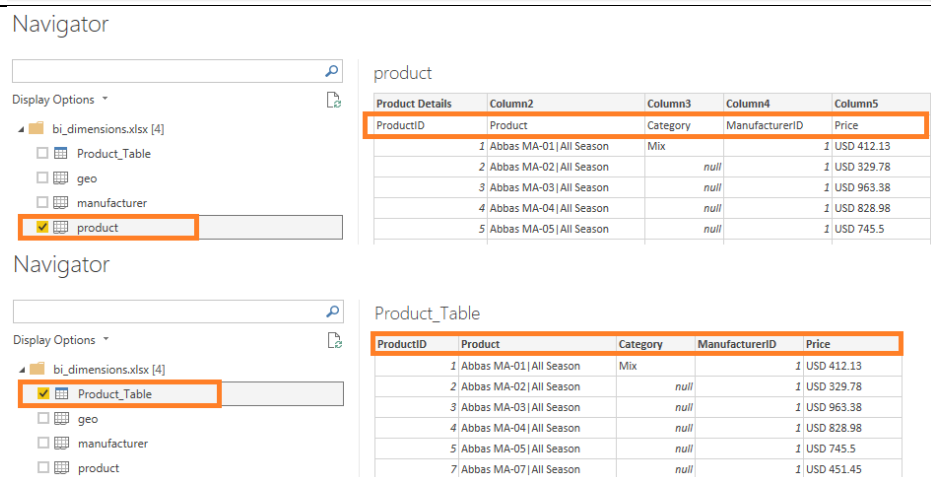
Navigator dialog opens.



20. Navigator dialog lists 3 sheets that are in the excel workbook. It also lists the Product named table. **Select product** from the left panel and in preview panel notice the first row is the header. This is not part of the data.

21. **Unselect product** from the left panel. **Select Product_Table**. Notice this has only the contents of the named table. This is the data we need.

Note: Table names are differentiated from Worksheet names by using different icons.



22. From the left panel, **select geo**. In the preview panel notice the first couple of rows are headers that are not part of the data. We will remove them shortly.

23. From the left panel, **select manufacturer**. In the preview panel notice the last couple of rows are footers that are not part of the data. We will remove them shortly.

24. Select **OK**. (Make sure Product_Table, geo and manufacturer are selected in the left panel)

Notice all 3 sheets are added as queries in the Query Editor.

geo

Source:	Public Database	Column3	Column4	Column5	Column6
Last Updated:	2/1/2016	null	null	null	null
	null	null	null	null	null
Zip	City	State	Region	District	Country
22654	Star Tannery, VA, USA	VA	East	District #07	USA
22655	Stephens City, VA, USA	VA	East	District #07	USA
22656	Stephenson, VA, USA	VA	East	District #07	USA

manufacturer

Column1	Column2	Column3
ManufacturerID		1
Manufacturer	Abbas	Aliqui
Logo	https://raw.githubusercontent.com/CharlesSterling/DiadManu/master/Ai	
	null	null
	null	null
List of Suppliers and Manufacturers		null

Power BI Desktop - Adding additional data

International subsidiaries have agreed to provide their sales data so that the company's sales can be analyzed together. You've created a folder where they each put their data.

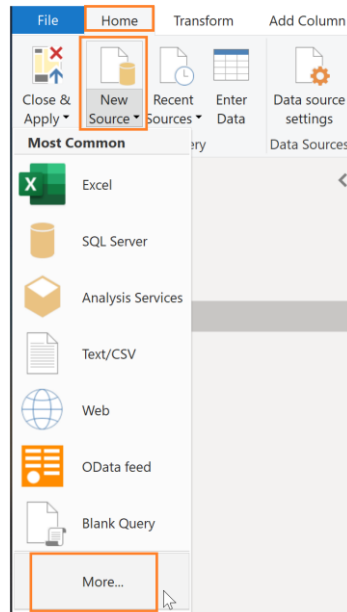
To analyze all the data together you will want to import the new data from each of the subsidiaries and combine it with the US Sales you loaded earlier.

You can load the files one at a time similar to the US Sales but Power BI provides an easier way to load all the files in a folder together.

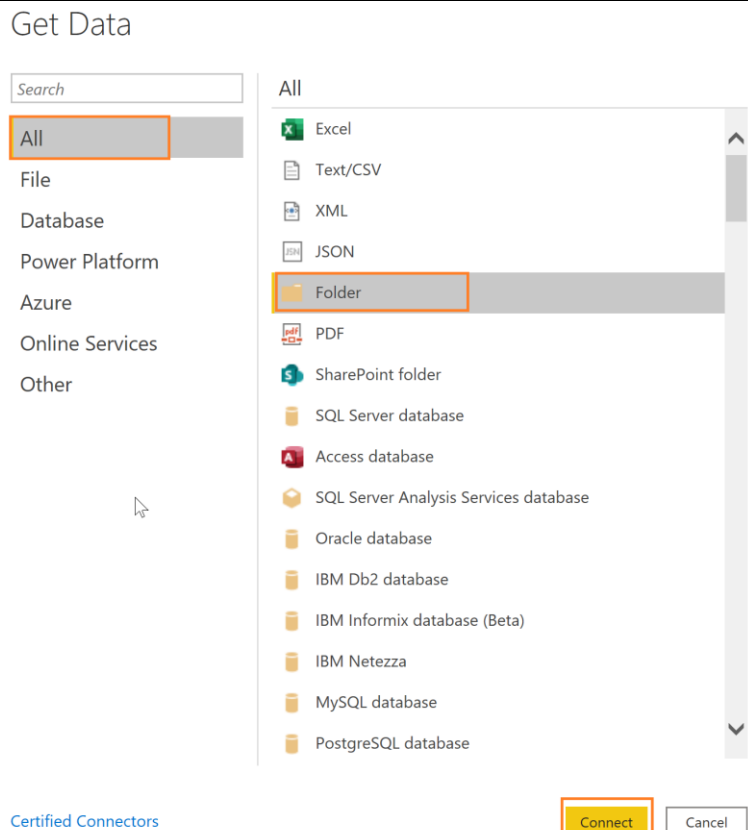
25. Click on the **New Source** drop down in the Home menu tab of the Query Editor.

26. Select **More...** as shown in the figure.

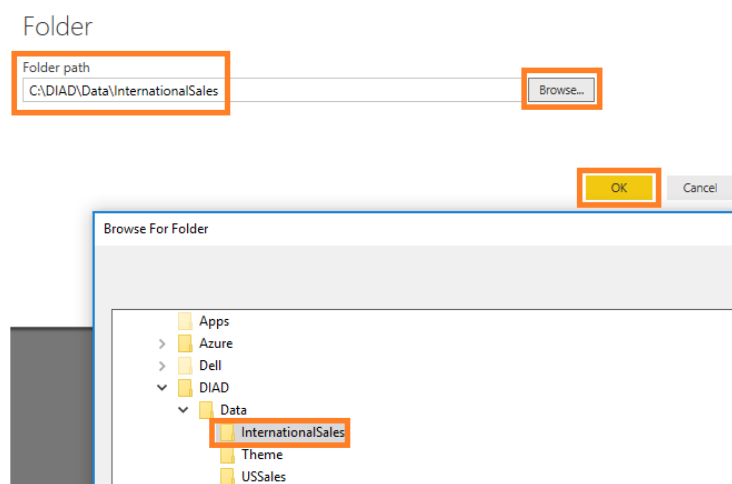
Get Data dialog opens.



27. In the Get Data dialog select **Folder** as shown in the diagram.
28. Click **Connect**.



- Folder dialog opens.
29. Click **Browse...** button.
30. In the **Browse for Folder** dialog navigate to the location where you unzipped the class files.
31. Open the **DIAD** folder.
32. Open the **Data** folder.
33. Select the **InternationalSales** folder.
34. Click **OK** (to close the Browse for Folder dialog box).
35. Click **OK** (to close the Folder dialog box).



Note: This approach will load all files in the folder. This is useful when you have a group that puts files on an ftp site each month and you are not always sure of the names of the files or the number of files. All the files must be of the same file type with columns in the same order.

Dialog displays the list of files in the folder.

36. Click **Combine & Transform Data**

Note: Date accessed, Date modified and Date created might be different compared to the dates displayed in the screenshot.

C:\DIAD\Data\InternationalSales

Content	Name	Extension	Date accessed	Date modified	Date created	Attributes	
Binary	Australia.csv	.csv	3/11/2020 11:02:33 AM	3/11/2020 10:52:35 AM	3/11/2020 11:02:33 AM	Record	C:\DIAD\Data\InternationalSales\Australia.csv
Binary	Canada.csv	.csv	3/11/2020 11:02:33 AM	3/11/2020 11:00:42 AM	3/11/2020 11:02:33 AM	Record	C:\DIAD\Data\InternationalSales\Canada.csv
Binary	Germany.csv	.csv	3/11/2020 11:02:33 AM	3/11/2020 11:00:35 AM	3/11/2020 11:02:33 AM	Record	C:\DIAD\Data\InternationalSales\Germany.csv
Binary	Japan.csv	.csv	3/11/2020 11:02:33 AM	3/11/2020 10:54:15 AM	3/11/2020 11:02:33 AM	Record	C:\DIAD\Data\InternationalSales\Japan.csv
Binary	Mexico.csv	.csv	3/11/2020 11:02:33 AM	3/11/2020 10:56:23 AM	3/11/2020 11:02:33 AM	Record	C:\DIAD\Data\InternationalSales\Mexico.csv
Binary	Nigeria.csv	.csv	3/11/2020 11:02:33 AM	3/11/2020 10:54:49 AM	3/11/2020 11:02:33 AM	Record	C:\DIAD\Data\InternationalSales\Nigeria.csv

Combine & Transform Data

Transform Data

Cancel

Combine Files dialog opens. By default, Power BI again detects the data type based on the first 200 rows. Notice there is an option to select various file Delimiters. The file we are working with is Comma delimited, so let's leave Delimiter option as Comma. There is also an option to select each individual file in the folder (using Example File dropdown) to validate the format of the files.

37. Select **OK**.

Combine Files

Specify the settings for each file. [Learn more](#)

Example File:

First file

File Origin

1252: Western European (Windows)

Delimiter

Comma

Data Type Detection

Based on first 200 rows

ProductID	Date	Zip	Units	Revenue	Country
1070	2018-01-18	2128	1	157.447500	Australia
1070	2018-04-02	2565	1	157.447500	Australia
1070	2018-04-25	4581	4	629.790000	Australia
1070	2018-04-26	1189	2	314.895000	Australia
1070	2018-04-26	3981	1	157.447500	Australia

☐ Skip files with errors

OK

Cancel

You will be in the **Query Editor** window with a new query called **InternationalSales**.

38. If you do not see the **Queries** pane on left, click on the > icon to expand.

39. If you do not see the **Query Settings** pane on the right as shown in the figure, click on **View** in the ribbon and click **Query Settings** to see the pane.

40. Click on the Query **InternationalSales**.

File Home Transform Add Column View Tools Help

Query Settings

Layout Data Preview Columns Parameters Advanced Dependencies

Queries [9]

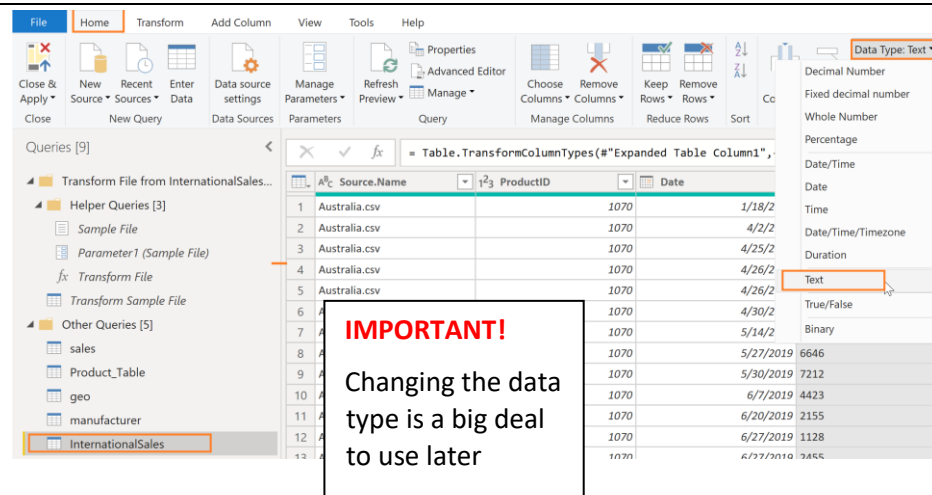
- Transform File from InternationalSales...
- Helper Queries [3]
 - Sample File
 - Parameter1 (Sample File)
 - Transform Sample File
- Other Queries [5]
 - sales
 - Product_Table
 - geo
 - manufacturer
 - InternationalSales**

Table.TransformColumnTypes(#"Expanded Table Column1",{"Source.Name", "ProductID", "Date", "Zip"})

Source.Name	ProductID	Date	Zip
1 Australia.csv	1070	1/18/2019	2128
2 Australia.csv	1070	4/2/2019	2565
3 Australia.csv	1070	4/25/2019	4581
4 Australia.csv	1070	4/26/2019	1189
5 Australia.csv	1070	4/26/2019	3981
6 Australia.csv	1070	4/30/2019	1189
7 Australia.csv	1070	5/14/2019	5010
8 Australia.csv	1070	5/27/2019	6646
9 Australia.csv	1070	5/30/2019	7212
10 Australia.csv	1070	6/7/2019	4423
11 Australia.csv	1070	6/20/2019	2155
12 Australia.csv	1070	6/27/2019	1128
13 Australia.csv	1070	6/27/2019	2455

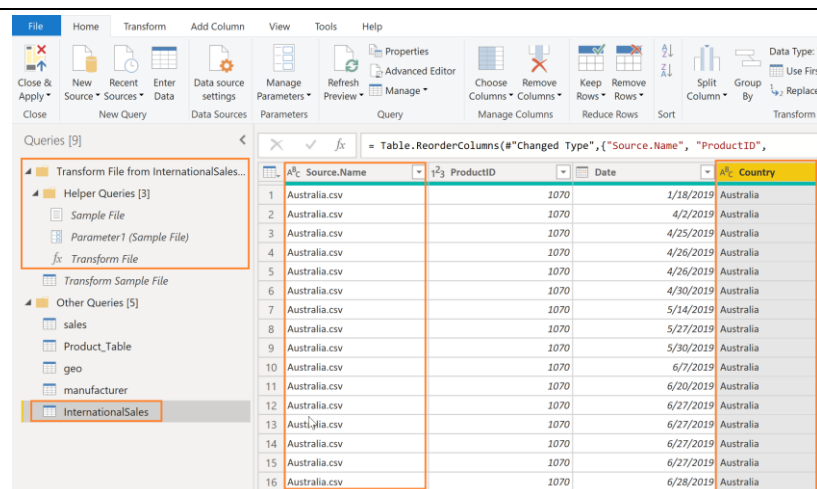
Notice that column Zip is of type Whole Number. Based on the first 200 rows Power BI thinks Zip is of type Whole Number. But zip code could be alpha numeric in some countries or leading zeros (similar to USA data). If we do not change the data type, we will see an error when we load the data shortly. So, let's change Zip to data type Text.

41. Highlight the **Zip** column and change the **Data Type** to **Text**.
42. **Change Column Type** dialog opens. Select **Replace Current** button.

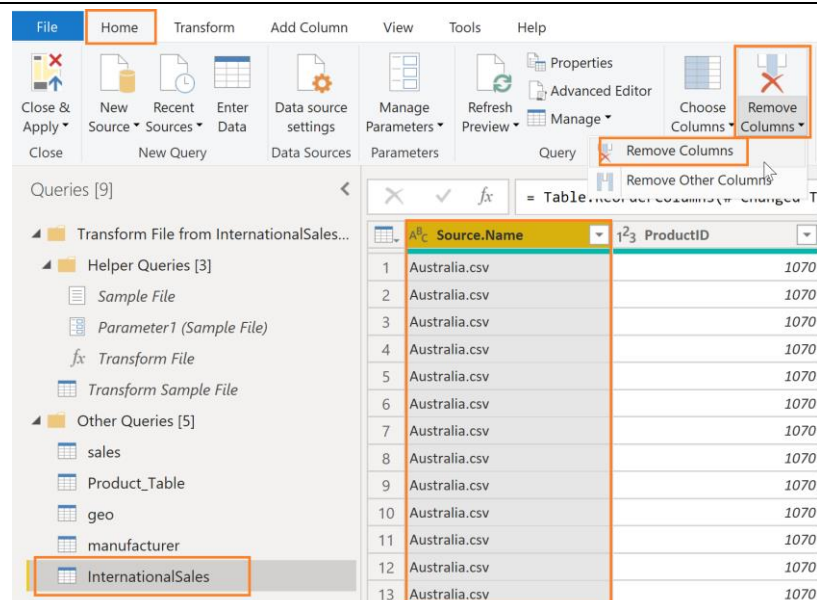


In Queries panel, notice Transform File from InternationalSales folder is created. This contains the function used to load each of the files in the folder.

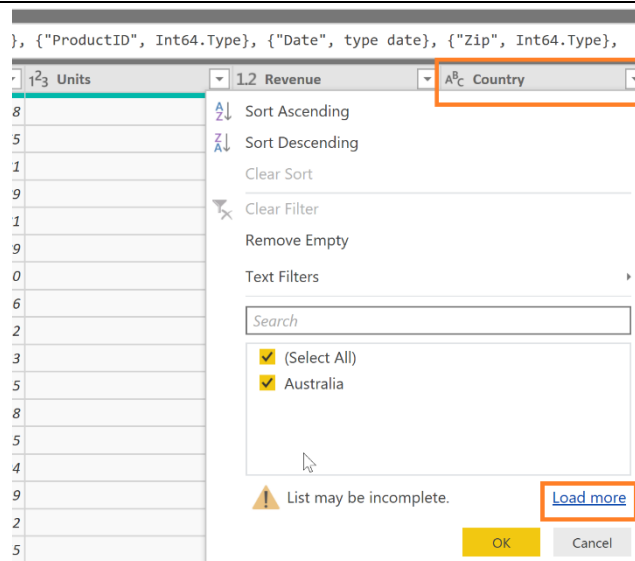
If you compare **InternationalSales** and **sales** table, you will see the **InternationalSales** table contains two new columns, **Source.Name** and **Country**.



43. We do not need Source.Name column. Select **Source.Name** column. From the ribbon, select **Home** -> **Remove Columns** -> **Remove Columns**.



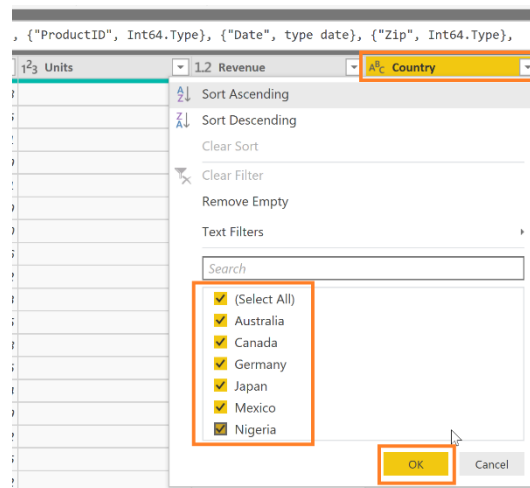
44. Click on the drop down next to **Country** column to see the unique values.
45. You will only see Australia as shown in the figure. By default, Power BI only loads the first 1000 rows. Click on **Load more** to validate you have data from various countries included.



You will see the countries, Australia, Canada, Germany, Japan, Mexico and Nigeria.

46. Click **OK**.

Note: You can perform various types of filters, sorting operations using the drop down to verify the imported data.



Power BI Desktop – Data Preparation

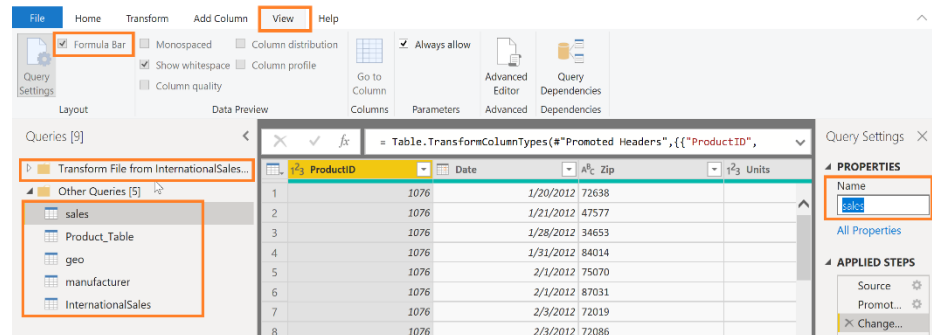
In this section, we will explore methods to [transform data in the data model](#). Transforming the data by renaming tables, updating data types, and appending tables together ensures that the data is ready to be used for reporting. In some instances, this means cleaning the data up so that similar sets of data are combined. In other instances, groups of data are renamed so that they are more recognizable by end users and simplifies report writing.

Power BI Desktop - Renaming tables

The Query Editor window should appear as shown in the diagram.

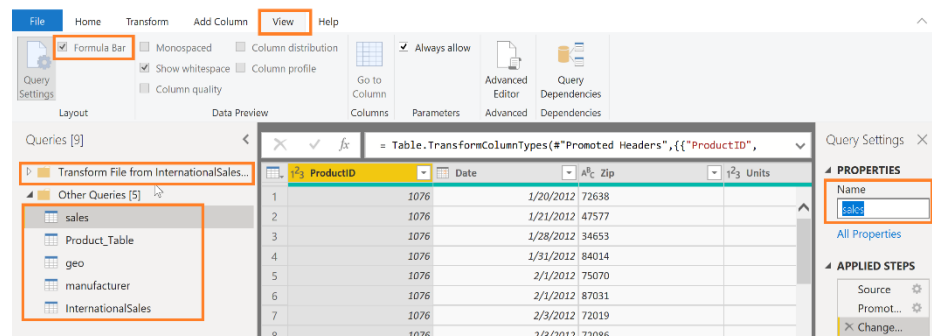
- If formula bar is disabled, you can turn on the formula bar from the View ribbon. This enables you to see the “M” code generated by each click on the ribbons.
- Select the options available on the ribbon – **Home, Transform, Add Column and View** to notice the various features available.

1. Under **Queries** panel, **minimize** Transform Files from InternationalSales folder.
2. Select each query name in the **Other Queries** section.
3. **Rename** them in the Query Settings -> Properties section as shown below:



Initial Name	Final Name
sales	Sales
Product_Table	Product
geo	Geography
manufacturer	Manufacturer
InternationalSales	International Sales

Note: It is best practice to give descriptive query names and column names. These names are used in visuals and in Q&A section, which is covered later in the lab.



Power BI Desktop – Filling empty values

Some of the data provided is not in the right format. Power BI provides extensive transformation capabilities to clean and prepare the data to meet our needs. Let's start with Product query. Notice that Category column has a lot of null values. Hover over the green/gray bar (known as quality bar) below the column header. This allows you to easily identify errors and empty values in your data previews. Looks like there are values in Category column only when the value changes. We need to fill it down to have values in each row.

4. From the left panel, select **Product** Query.
5. Select **Category** column.
6. From the ribbon select **Transform** -> **Fill** -> **Down**.

Notice now all the null values are filled with the appropriate Category values.

The screenshot shows the Power BI Desktop interface. In the left-hand 'Queries' pane, the 'Product' query is selected. The main data view shows a table with columns: ProductID, Product, Category, and Manufacturer. The 'Category' column is highlighted, and its values are 'Mix' for all rows. The ribbon at the top shows the 'Transform' tab selected, with the 'Fill' group expanded and 'Down' selected. The data view shows the 'Category' column filled with 'Mix' for all rows.

Power BI Desktop – Splitting columns

In Product query, notice Product column. Looks like the product name and product segment are concatenated into one field with a pipe (|) separator. Let's split them into two columns. This will be useful when we build visuals, so we can analyze based on both fields.

7. From the left panel, select **Product** Query.
8. Select **Product** column.
9. From the ribbon select **Transform** -> **Split Column** -> **By Delimiter**. Split Column by Delimiter dialog opens.
10. In the dialog, make sure **Custom** is selected in the **Select or enter delimiter** dropdown.
- Note:** Select or enter delimiter dropdown has some of the standard delimiters like comma, colon, etc.
11. Notice in the text area, there is a hyphen (-). Power BI assumes we want to split by hyphen. **Remove hyphen** symbol and **enter pipe symbol (|)** as shown in the screenshot.
12. Select **OK**.

Note: If the delimiter occurs multiple times, **Split at** section provides option to split only once (either left most or right most) or the column can be split on each occurrence of the delimiter.

The screenshot shows the Power BI Desktop interface. In the left-hand 'Queries' pane, the 'Product' query is selected. The main data view shows a table with columns: ProductID, Product, Category, and Manufacturer. The 'Product' column is highlighted. The ribbon at the top shows the 'Transform' tab selected, with the 'Split Column' group expanded and 'By Delimiter' selected. The 'Split Column by Delimiter' dialog box is open, showing the 'Select or enter delimiter' dropdown set to '--Custom--' and the text area containing a hyphen (-).

In this scenario delimiter occurs only once, hence Product column is split into 2 columns.

Power BI Desktop – Renaming columns

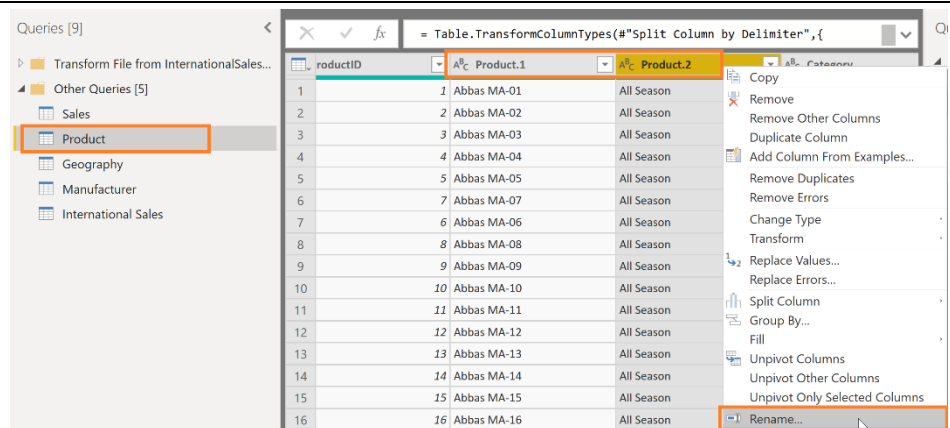
Let's rename the columns.

13. Select **Product.1** column. **Right click** next to the column name.

14. Select **Rename** from the selection dialog.

15. **Rename** the field to **Product**.

16. Similarly rename **Product.2** to **Segment**.



Power BI Desktop – Using Column From Examples to split columns

In Product query, notice that the Price column has price and currency concatenated into one field. To do any calculations we just need the numeric value. It will be good to split this field into two columns. We can use the split feature like earlier or we can use Column From Examples. Column From Examples is handy in scenarios where the pattern is more complex than a delimiter.

17. From the left panel, select **Product** Query.

18. From the ribbon, select **Add Column -> Column From Examples -> From All Columns**.

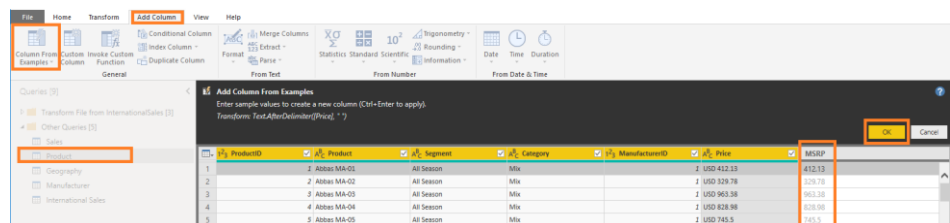
19. In the **first row of Column1** enter the first Price value which is **412.13** and click enter.

Notice as you enter, Power BI knows that you want to split Price column. The formula it uses is displayed as well.

20. **Double click** column header **Text After Delimiter** to rename it.

21. **Rename** the column to **MSRP**.

22. Click **OK** to apply the changes.

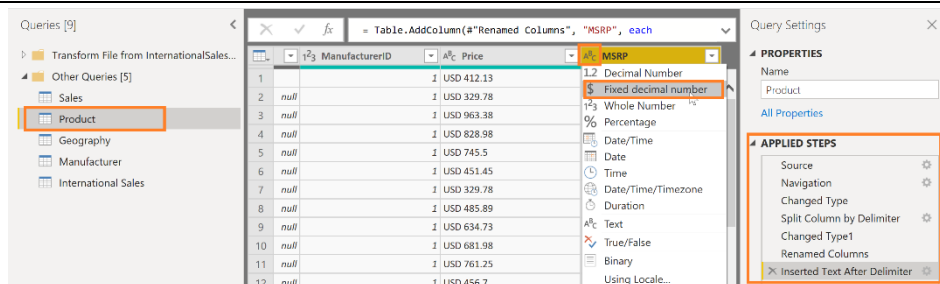


Notice MSRP field is of data type text. It must be a decimal. Let's change it.

23. Select **ABC** in **MSRP** column.

24. From the selection dialog, select **Fixed Decimal Number**.

Notice all the steps we performed on the Product query are being recorded under **APPLIED STEPS** in the right panel.



Similarly, let's create a currency column.

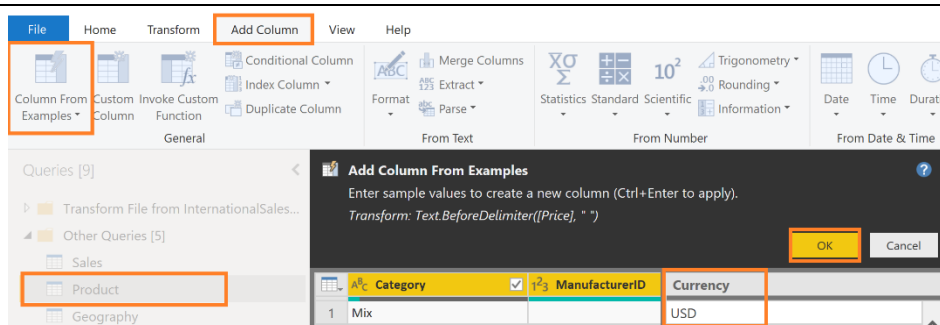
25. With Product query selected, from the ribbon, select **Add Column -> Column From Examples -> From All Columns**.

26. In the **first row of Column1** enter the first Currency value as **USD** and click enter. Notice as you enter, Power BI knows that you want to split Price column. The formula it uses is displayed as well.

27. **Double click** column header **Text Before Delimiter** to rename it.

28. **Rename** the column to **Currency**.

29. Click **OK** to apply the changes.

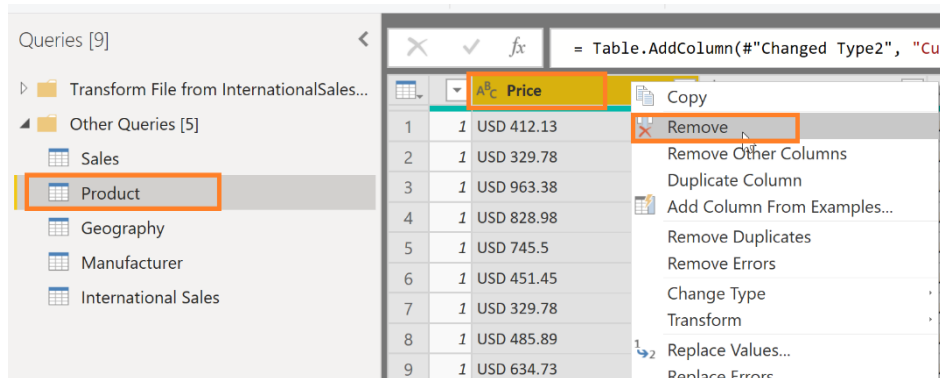


Now that we have split Price into MSRP and Currency columns, we don't need Price column. Let's remove it.

30. From the left panel, select **Product** Query.

31. **Right click** next to **Price** column.

32. Select **Remove**.



Power BI Desktop – Removing unwanted rows

In Geography query, notice that first two rows are informational. It is not part of the data. Similarly, in Manufacturer query the last couple of rows are not part of the data. Let's remove them so we have a clean dataset.

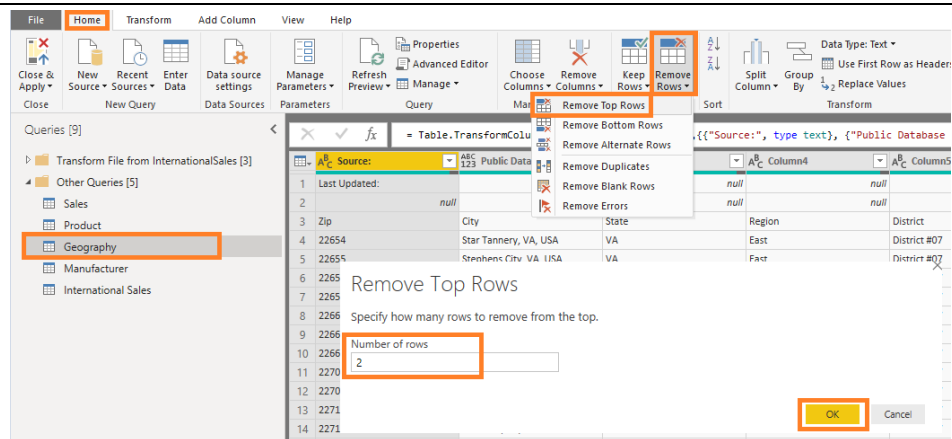
33. In the left panel, select **Geography** query.

34. From the ribbon, select **Home** ->

Remove Rows -> **Remove Top Rows**.

35. Remove Top Rows dialog opens. Enter **2** in the text box, since we want to remove the top informational data row and the blank 2nd row.

36. Select **OK**.



Notice the first row in Geography query now is the column header. So let's make it a header.

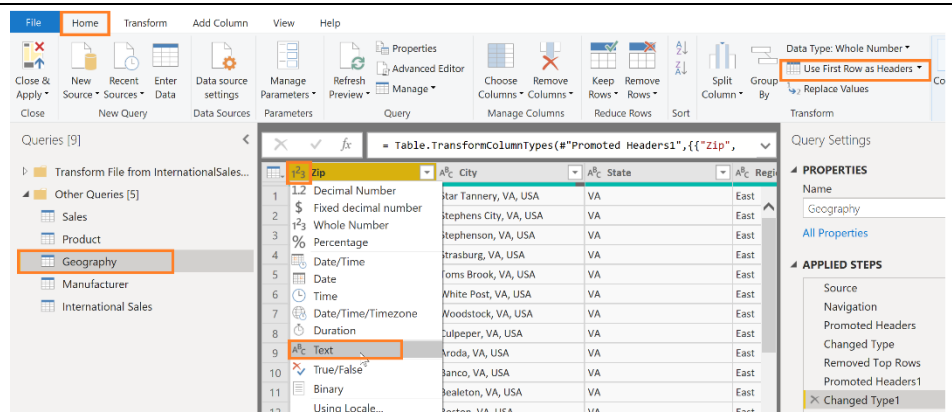
37. With **Geography** query selected in the left panel, from the ribbon select **Home** -> **Use First Row as Headers**.

With that step Power BI predicts data type of each field again

Notice column Zip was changed to data type number. Let's change it to text as we did earlier. If we don't we will see errors when we load the data.

38. Select **123** next to Zip Column. From the dialog, select **Text**.

39. Select **Replace Current** in the **Change Column Type** dialog.



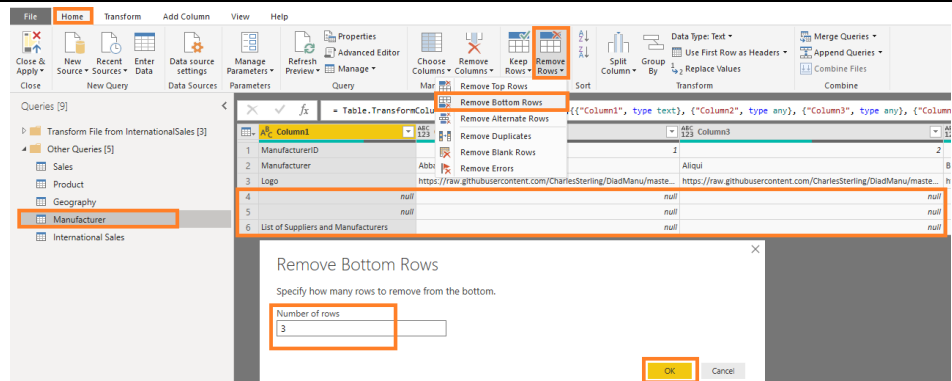
40. From the left panel, select **Manufacturer** query. Notice the bottom 3 rows are not part of the data. Let's remove them.

41. From the ribbon, select **Home** ->

Remove Rows -> **Remove Bottom Rows**

42. Remove Bottom Rows dialog opens. Enter **3** in **Number of rows** text box.

43. Select **OK**.

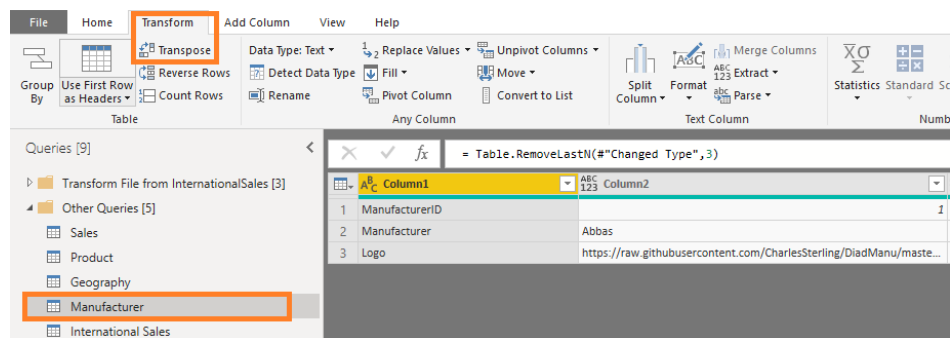


Power BI Desktop – Transposing data

44. From the left panel, select **Manufacturer** Query. Notice ManufacturerID, Manufacturer and Logo data is laid across in rows. And the header is not useful. We need to transpose the table to meet our needs.

45. From the ribbon select **Transform** -> **Transpose**.

Notice this transposes the data into columns. Now we need the first row to be the header.

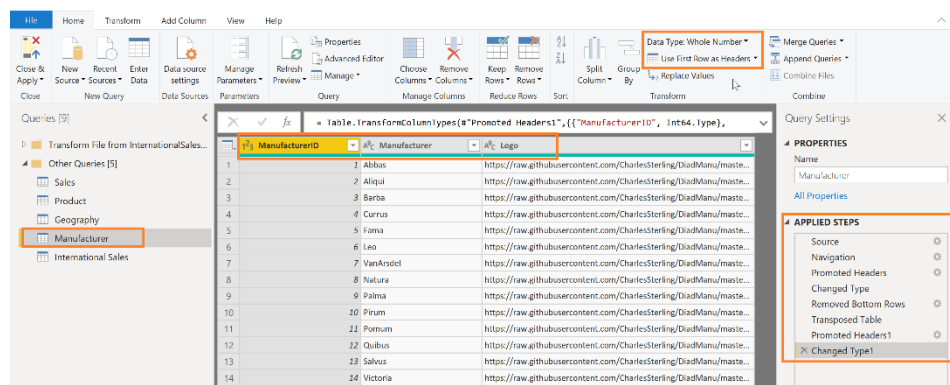


46. From the ribbon select **Home** -> **Use First Row as Headers**.

Notice now Manufacturer table is laid out the way we need it with a header and values along columns.

Notice on the right panel under **APPLIED STEPS** you will see the list of transformations and steps that have been applied.

You can navigate through each change made to the data by clicking on the step. Steps can also be deleted by clicking on the **X** that appears to the left of the step. The properties of each step can be reviewed by clicking on the **gear** to the right of the step.



Power BI Desktop – Appending queries

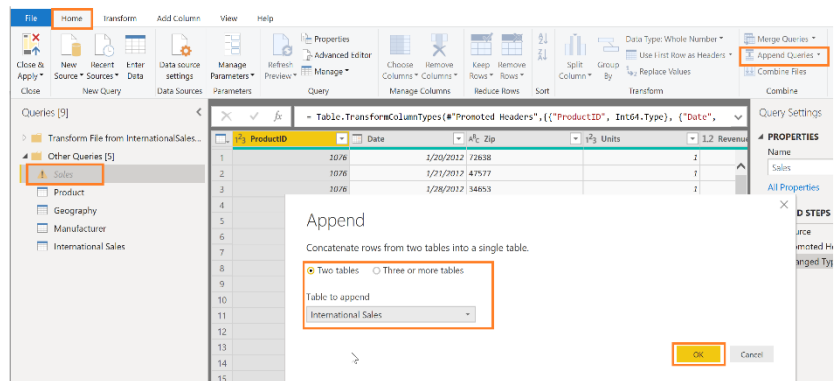
To analyze the Sales of all countries, it is convenient to have a single Sales table. Hence you want to append all the rows from **International Sales** to **Sales**.

47. Select **Sales** in the Queries window in the left panel as shown in the figure.

48. From the ribbon select **Home** -> **Append Queries**.

Append dialog opens. There is an option to append **Two tables** or **Three or more tables**. Leave **Two tables** selected since we are appending just two tables.

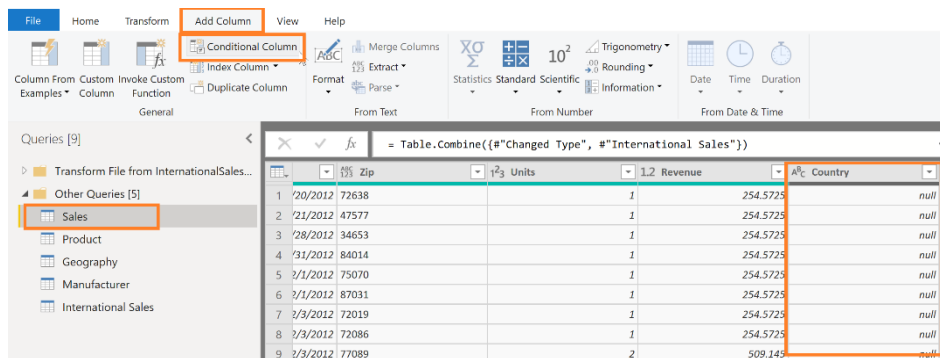
49. Select **International Sales** from the drop down and click **OK**.



You will now see a new column in the **Sales** table called **Country**. Since International Sales had the additional column for Country, Power BI Desktop added the column to the Sales table when it loaded the values from International Sales.

You see **null values** in the **Country** column by default for the Sales table rows because the column did not exist for the table with USA data. We will add the value **"USA"** as a data shaping operation.

50. From the ribbon select **Add Column -> Conditional Column**.



51. In the **Add Conditional Column** dialog, enter name of the column as **"CountryName"**.

52. Select **Country** from the **Column Name** dropdown.

53. Select **equals** from the **Operator** dropdown.

54. Enter **null** in the **Values** text.

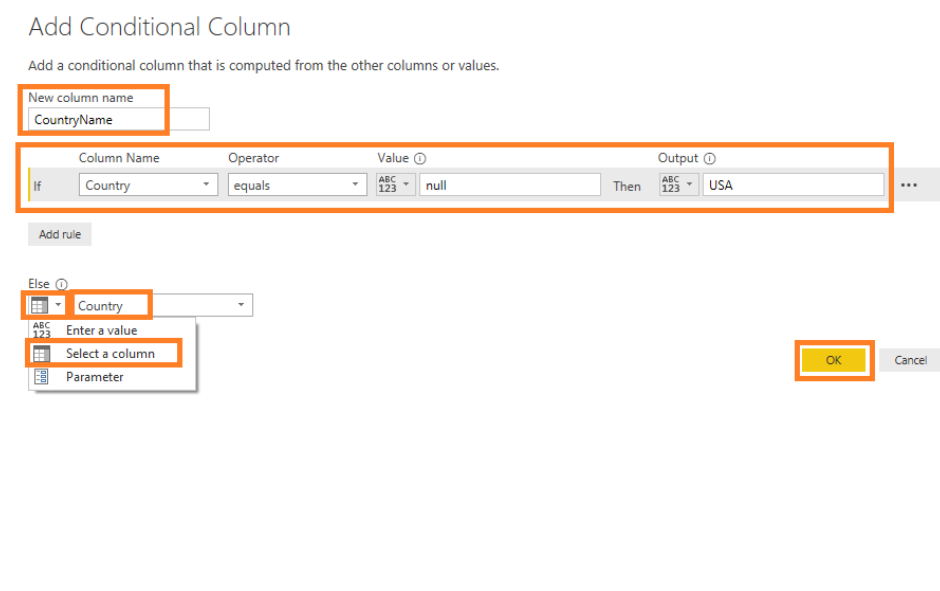
55. Enter **USA** in the **Output** text.

56. Select the dropdown under **Else** and pick **Select a column** option.

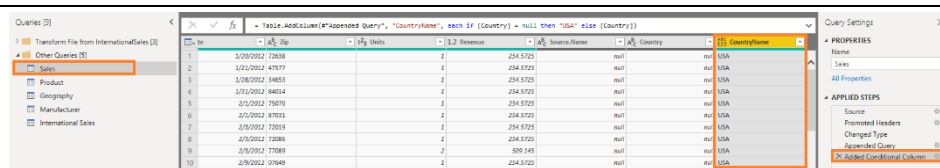
57. Select **Country** from the column dropdown.

58. Click **OK**.

This reads: if Country equals null then the value is USA else value is that of Country.



59. You will see the **CountryName** column in the Query editor window.



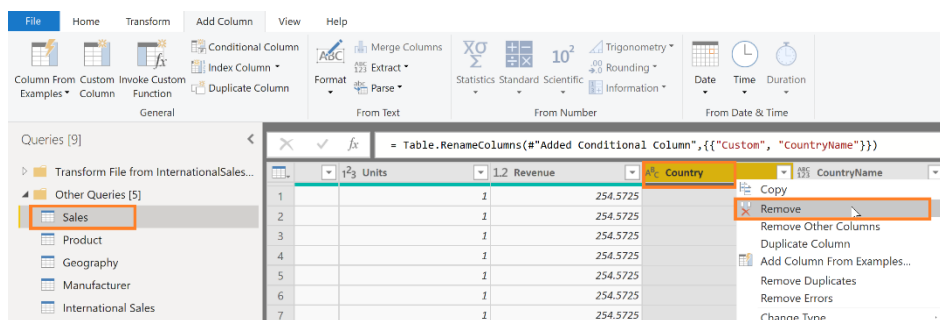
The original **Country** column is only required as a temporary column. It is not required in the final table for analysis and can be removed.

60. Right click on the **Country** column and select **Remove** as shown in the figure.

We can now rename **CountryName** column to **Country**.

61. Right click on the **CountryName** column and rename to **Country**.

62. Using **Home -> Data Type** or by selecting the data type next to the column



header, change the **data type** of the **Country** column to type **Text**.

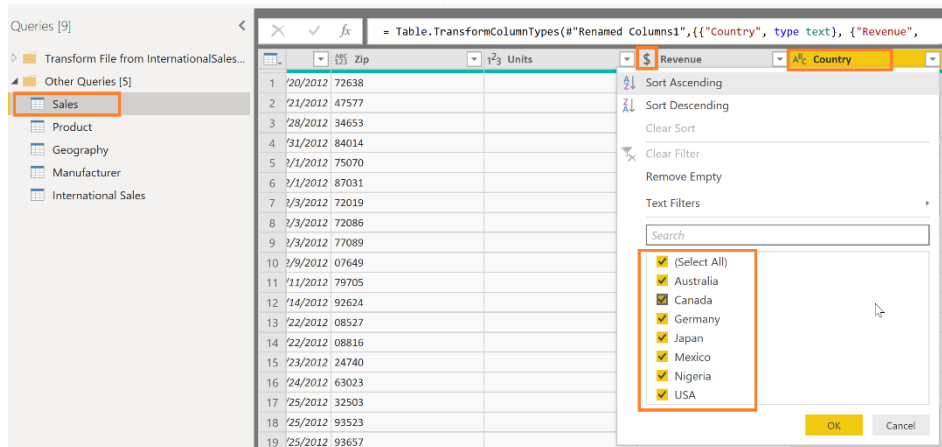
63. Using **Home -> Data Type** or by selecting the data type next to the column header, change the **data type** of the **Revenue** column to type **Fixed Decimal Number** since it is a currency field. When the data is refreshed, it will process through all the “Applied Steps” that you have created.

The newly named **Country** column will have names for all countries, including the USA.

You can validate this by clicking on the drop down next to **Country** column to see the unique values.

64. At first, you will only see USA data. Click on **Load more** to validate you have data from all 7 countries.

65. Click **OK** to close this filter.



Typically, when exploring data, we load a subset of data. There are multiple ways to do this. From the ribbon, select **Home -> Keep Rows -> Keep Top Rows** OR **Home -> Keep Rows -> Keep Bottom Rows** OR **Home -> Keep Rows -> Keep Range of Rows**. You can use any of these options to filter down to a subset of data.

Our dataset has data from 2013 to 2019. For our analysis we want to start with the last 3 years of data (2017-2019). We don't know how many rows. We can filter by year to get the subset.

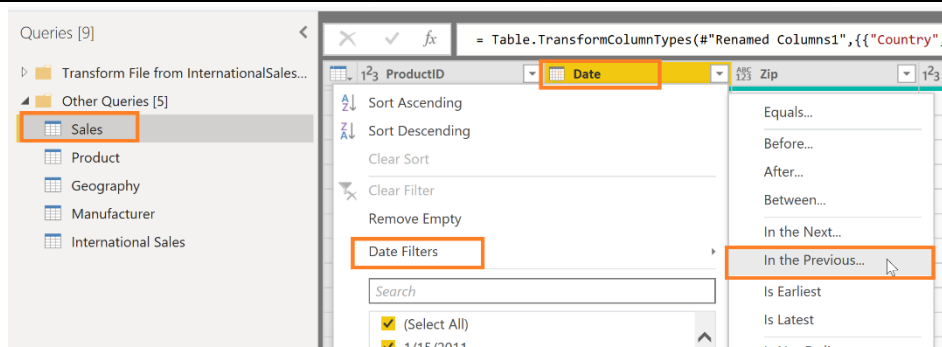
66. Select the **arrow** next to **Date** in **Sales** Query.

67. Select **Date Filters -> In the Previous...**

68. Filter Rows dialog opens. Enter **3** in the text box next to **is in the previous**.

69. Select **years** from the dropdown.

70. Select **OK**.



Filter Rows

Apply one or more filter conditions to the rows in this table.

☒ Basic ☐ Advanced

Keep rows where 'Date'

is in the previous 3 years

☒ And ☐ Or

Enter or select a value

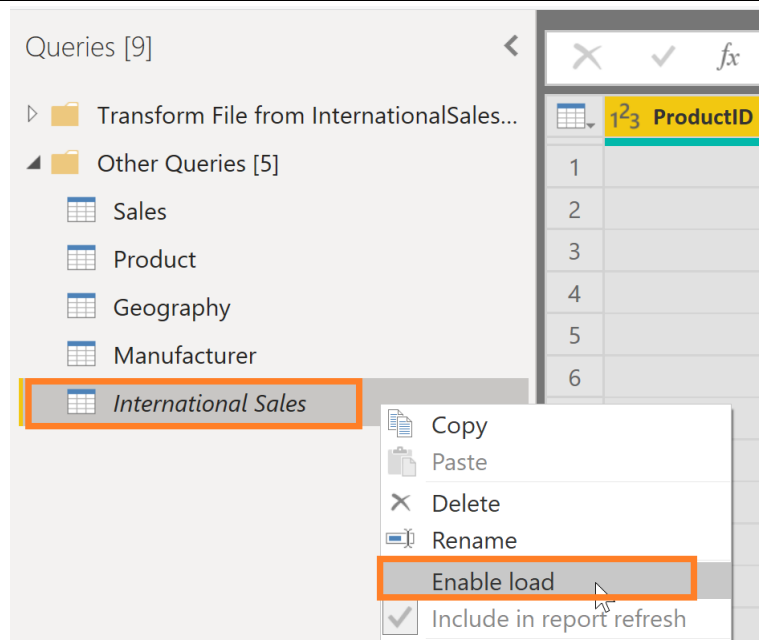
OK

Cancel

Now that International Sales data is appended to Sales, we don't need the International Sales table to load to the data model. Let's prevent International Sales table from loading to the data model.

71. From the Queries panel on the left, select **International Sales** query.
72. Right click and select **Enable Load**. This will disable loading International Sales.

Note: The appropriate data from the International Sales table will load into the Sales table each time the model is refreshed. By removing the International Sales table, we are preventing duplicate data from loading into the model and increasing its file size. In some instances, storing very large amounts of data affects the data model performance.

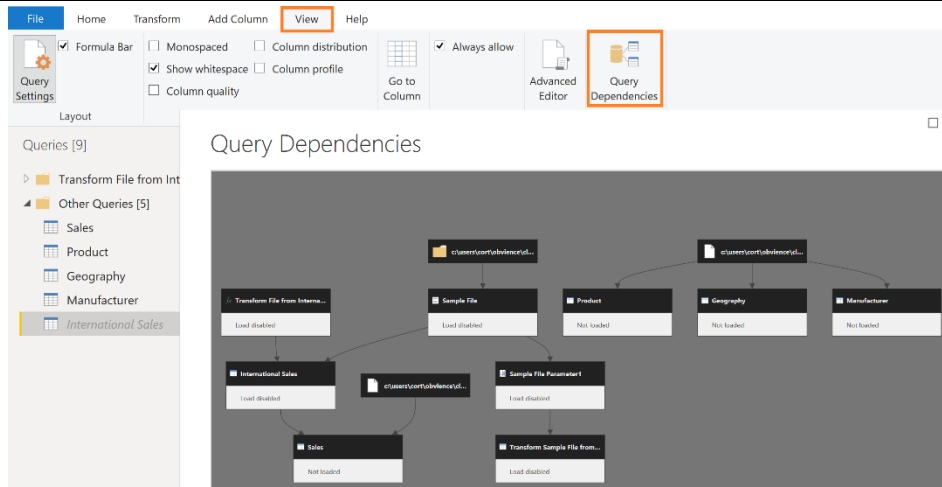



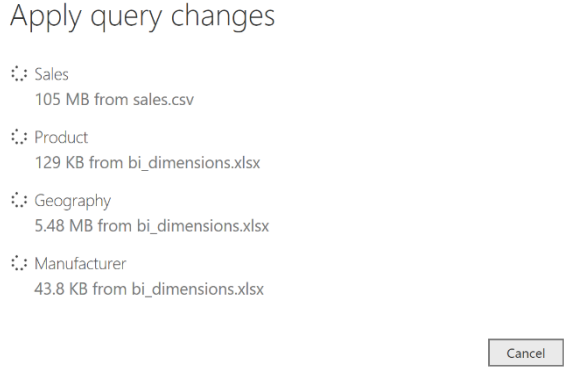
73. From the ribbon select **View -> Query Dependencies**.

This opens Query Dependencies dialog. The dialog shows the source of each of the queries and dependencies. E.g. We see that Sales query has a csv file source and it has a dependency on International Sales query. This is a useful self-document that can be used to share knowledge with your team members.

74. Select **Close** in the dialog.

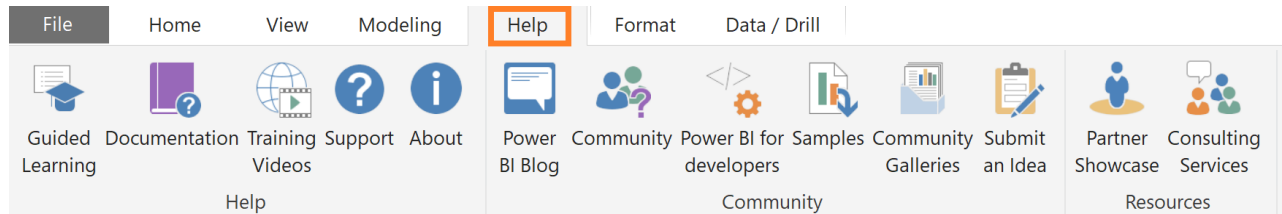
Query Dependencies view can be zoomed in and out as needed.



<p>You have successfully completed import and data shaping operations and are ready to load the data into the Power BI Desktop data model which allows you to visualize the data.</p> <p>75. Click on File -> Close & Apply.</p>	
<p>All the data will be loaded in memory within Power BI Desktop. You will see the progress dialog with the number of rows being loaded in each table as shown in the Figure.</p> <p>Note: It may take several minutes to load all the tables.</p> <p>76. Select File -> Save to save the file after the data loading is complete. Name the file as “MyFirstPowerBIModel”. Save the file in \DIAD\Reports folder.</p>	

References

Dashboard in a Day introduces you to some of the key functionalities available in Power BI. In the ribbon of Power BI Desktop, the Help section has links to some great resources to help you as needed.



Here are a few more references that will help you with your next steps with Power BI.

Getting started: <http://powerbi.com>

Power BI Desktop: <https://powerbi.microsoft.com/desktop>

Power BI Mobile: <https://powerbi.microsoft.com/mobile>

Community site <https://community.powerbi.com/>

Power BI Getting started support page:

<https://support.powerbi.com/knowledgebase/articles/430814-get-started-with-power-bi>

Support site <https://support.powerbi.com/>

Feature requests <https://ideas.powerbi.com/forums/265200-power-bi-ideas>

New ideas for using Power BI https://aka.ms/PBI_Comm_Ideas

Power BI courses <http://aka.ms/pbi-create-reports>

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