



University Workshop Series

Power Query

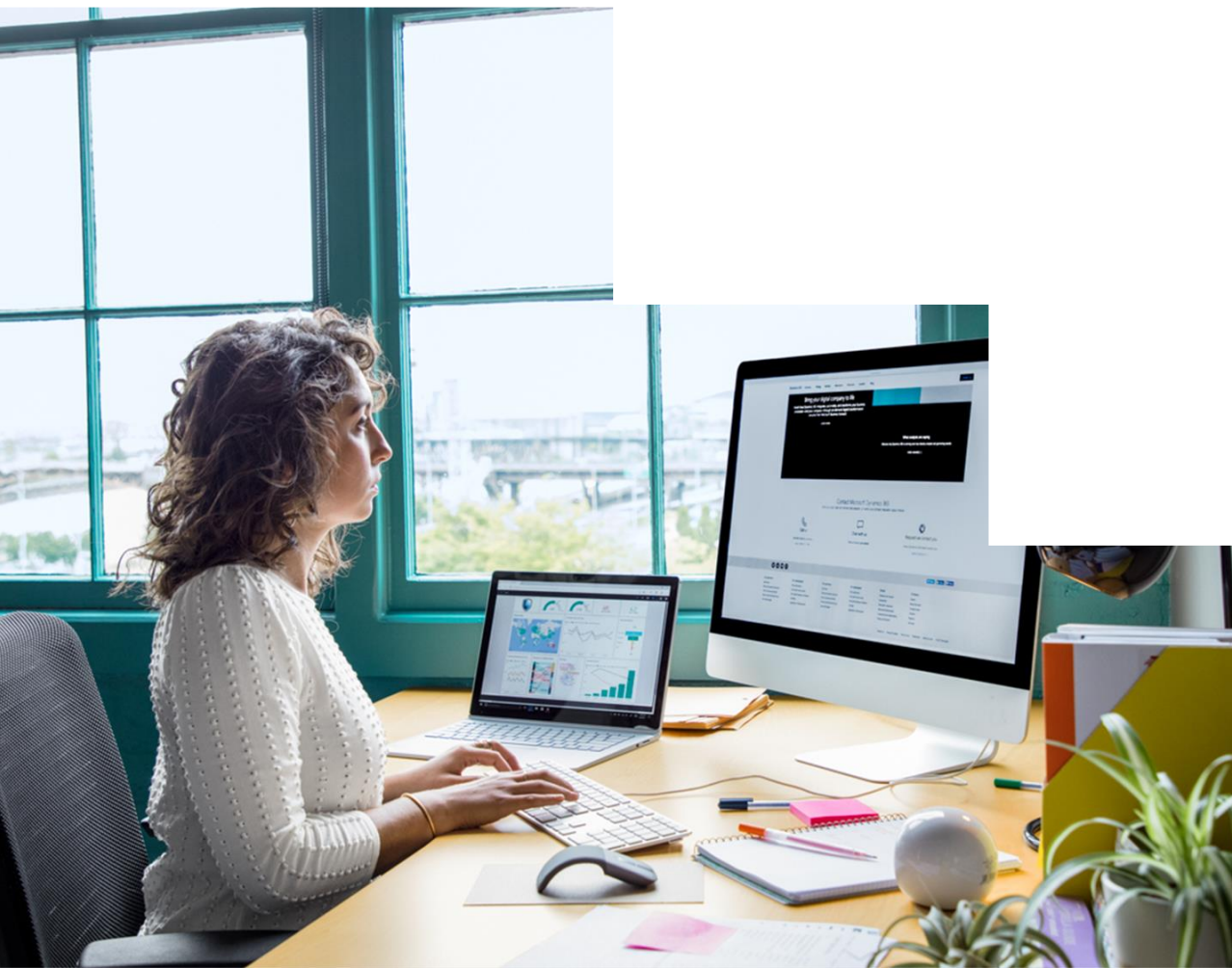
Hands-on Training Lab

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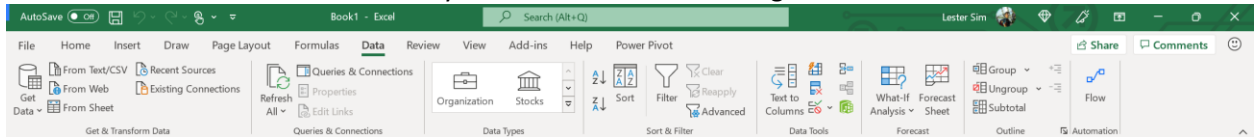


Content Page

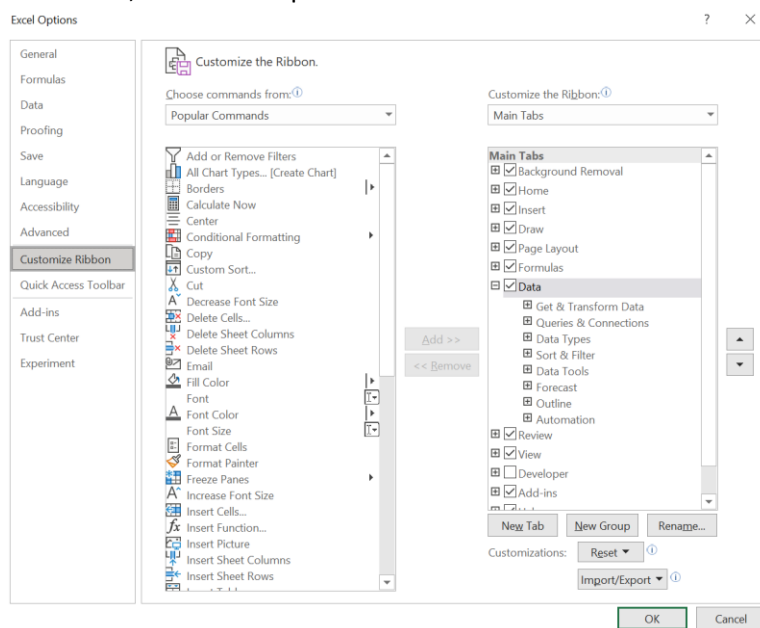
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Environment Set Up

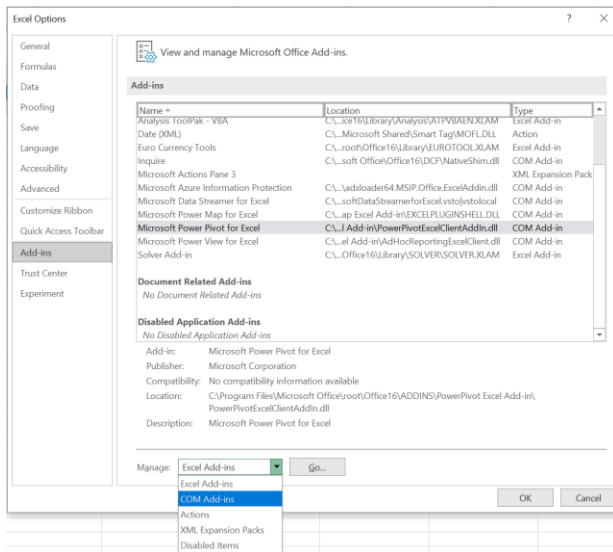
1. Download files from <https://github.com/lestersimij/MSLearnPowerQuery>
2. Check your version of Excel. No installation required for Excel 2016 and Office 365. Power Query is integrated in those versions, no additional installation required. For Excel 2010 and 2013, you will need to install a free Power Query add-in (<https://www.microsoft.com/en-au/download/details.aspx?id=39379>).
3. Click the Data tab of the Ribbon and you should see the following screen



4. Otherwise, click File > Options > Customize Ribbon and ensure that the Data checkbox is checked



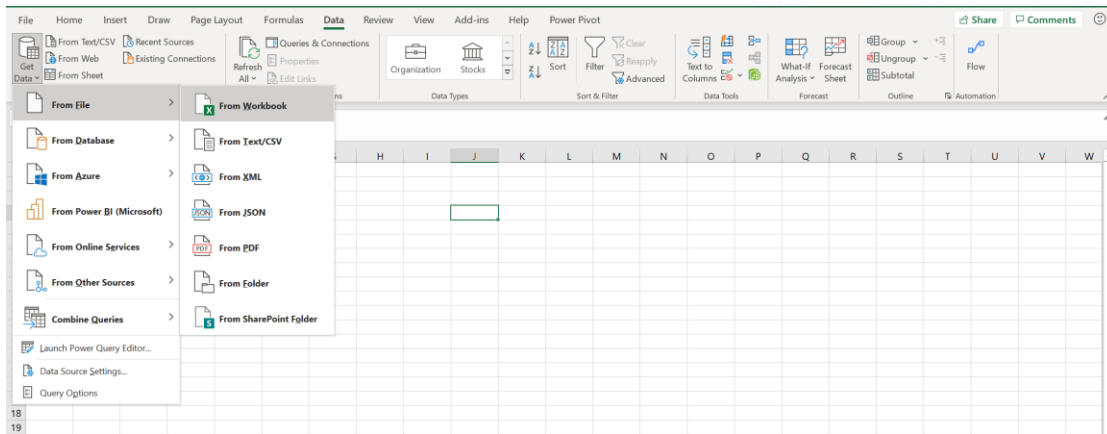
5. To enable the Power Pivot Ribbon, click **File > Options > Add-ins > Click Microsoft Power Pivot for Excel**
6. At the bottom of the window click **Manage > COM Add-ins > Go**



Importing of Data

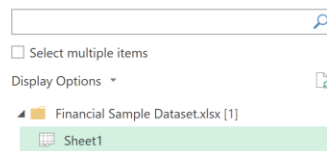
Importing a Single File

1. Create a new spreadsheet.
2. Select **Data > Get Data > From File > From Workbook**. Open “Financial Sample Dataset.xlsx”.



3. A prompt appears to select which table to load from the spreadsheet. Select **Sheet1** and click **Transform Data**.

Navigator



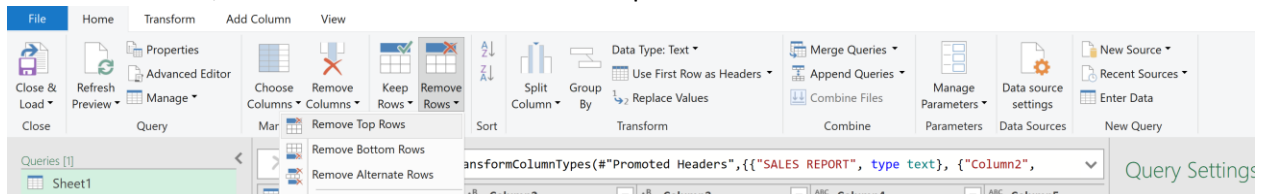
Sheet1

SALES REPORT	Column2	Column3	Column4
Created On: 4th Oct 2021		null	null
Created By: PTY		null	null
	null	null	null
	null	null	null
Segment	Country	ProductCode	Units S
	null	null	null
	null	null	null
Government	Canada	Carretera781232	
Government	Germany	Carretera781232	
Midmarket	France	Carretera781232	
Midmarket	Germany	Carretera781232	
Midmarket	Mexico	Carretera781232	
Government	Germany	Carretera781232	
Midmarket	Germany	Montana304145	
Channel Partners	Canada	Montana304145	
Government	France	Montana304145	
Channel Partners	Germany	Montana304145	

Transform and Shape Data (Rows)

Remove Rows and Promote / Demote Headers

1. On the Home tab, select Remove Rows > Remove Top Rows



2. Specify to remove top 4 rows in the prompt

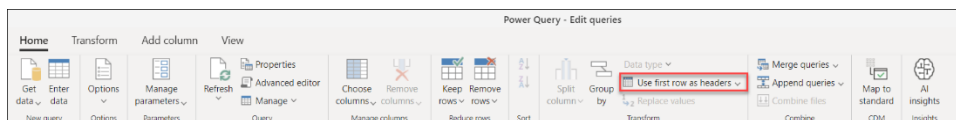
Remove Top Rows

Specify how many rows to remove from the top.

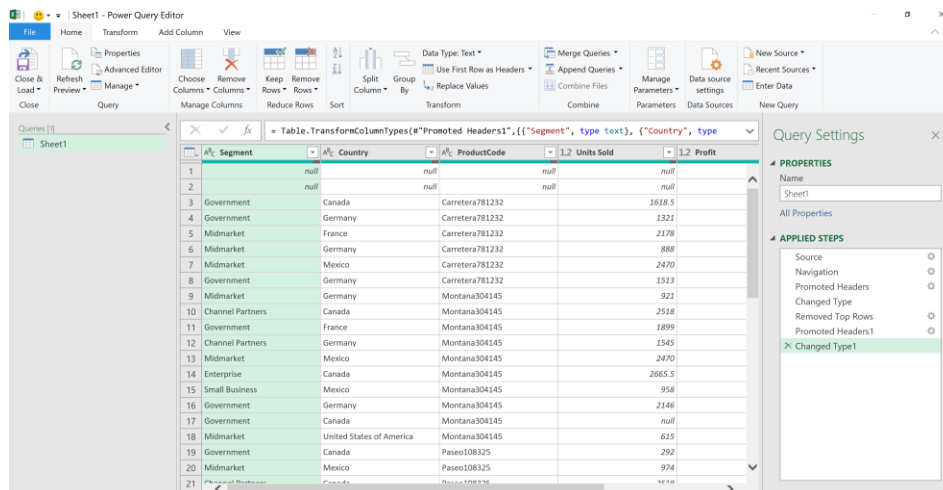
Number of rows

OK Cancel

3. On the Home tab, in the Transform group. Select Use First Rows as Headers



4. After you do the promote headers operation, your table will look like the following image.

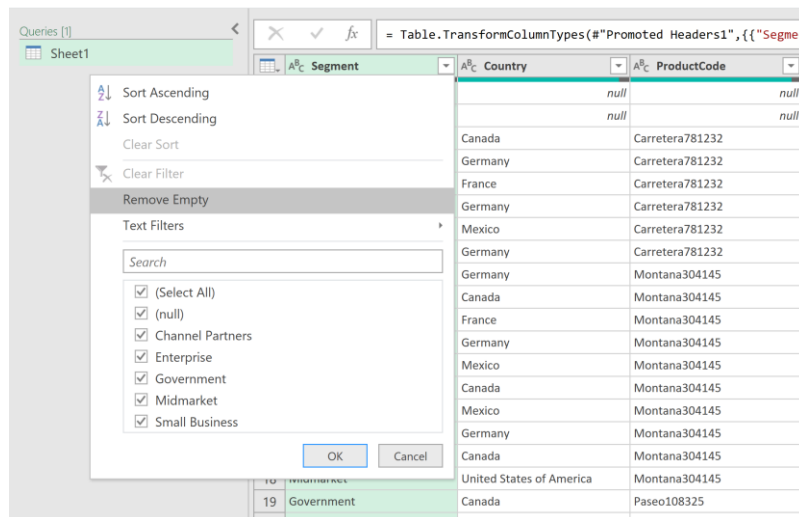


Note: To demote headers, repeat steps by replacing “Use First Rows as Headers” with “Use Headers as First Rows”.

Transform and Shape Data (Columns)

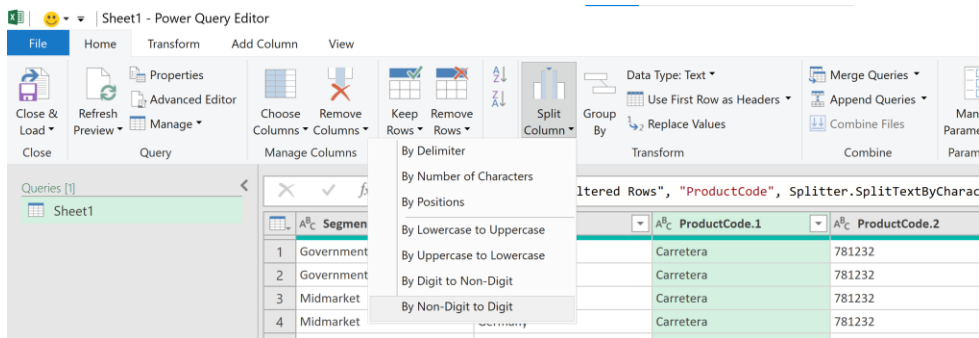
Remove Empty

1. In the column header, you'll see an icon with an inverse triangle. When you select this icon, the sort and filter menu is displayed. With this menu, you can apply or remove any filters to or from your column.
2. Select **Segment** > **Remove empty** from the sort and filter menu, as shown in the following image.



Split Columns (by Number of Characters)

1. Select the **ProductCode** column > **Split Column** > **By Non-Digit to Digit**.



2. The result of that operation will give you a table with two columns.

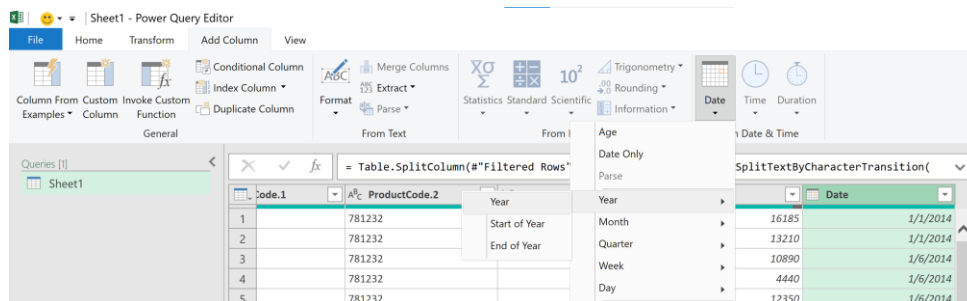
= Table.SplitColumn("#Filtered Rows", "ProductCode", Splitter.SplitTextByCharacterTransition(
Segment	Country	ProductCode.1	ProductCode.2	Units Sold	
1 Government	Canada	Carretera	781232		
2 Government	Germany	Carretera	781232		
3 Midmarket	France	Carretera	781232		
4 Midmarket	Germany	Carretera	781232		
5 Midmarket	Mexico	Carretera	781232		
6 Government	Germany	Carretera	781232		
7 Midmarket	Germany	Montana	304145		
8 Channel Partners	Canada	Montana	304145		

3. Rename the columns as **ProductName** and **ProductID**

Reshaping Data

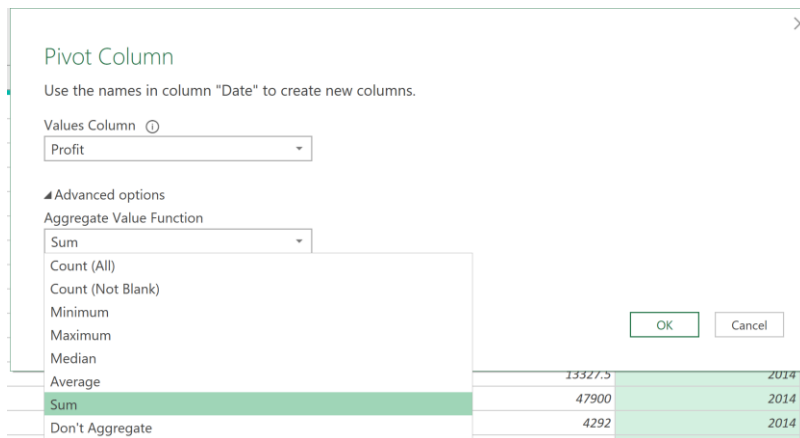
Pivot

1. Select the **Date** column > **Transform** > **Date** > **Year**



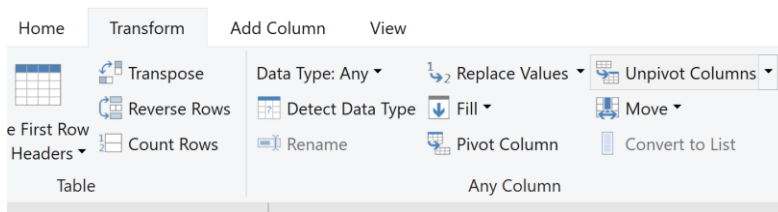
2. Select the **Year** Column > **Transform** > **Pivot Column**.

3. In the Pivot column dialog box, in the Value column list, select **Profit**. By default, Power Query will try to do a sum as the aggregation, but you can select the Advanced option to see other available aggregations.



Unpivot

1. Select columns **2013** and **2014**. To select more than one column contiguously or discontinuously, press Shift+Click or CTRL+Click on each subsequent column.
2. Click **Transform > Unpivot Columns**. Rename **Attribute** as **Year** and **Value** as **Profit**.



Aggregating and Filtering Data

Group Rows of Data

1. Select **Group by** on the **Home** tab.
2. Select the **Advanced** option, so you can select multiple columns to group by.
3. Select the **Country** and **Segment** columns.
4. In the New columns section, create a new column where the name is **Total Profit**, the aggregate operation is **Sum**, and the column used is **Profit**. Hit Ok.

Group By

Specify the columns to group by and one or more outputs.

☐ Basic ☒ Advanced

Segment

Country

Add grouping

New column name

Total Profit

Add aggregation

Operation

Sum

Column

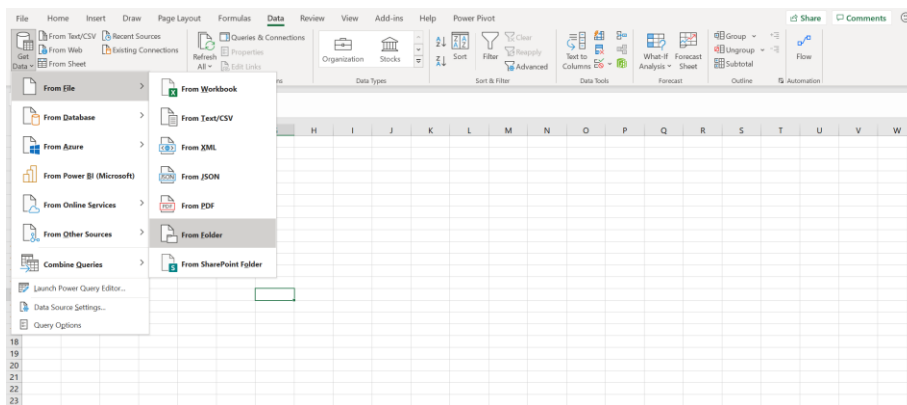
Profit

OK

Cancel

Importing from a Folder of Files

1. Create a new worksheet.
2. Select **Data > Get Data > From File > From Folder**. The **Browse** dialog box appears. Navigate to the folder “Financial Sample – Folder Import”.



3. A list of the files in the folder appears in the **<Folder path>** dialog box. Verify that all the files you want are listed.

C:\Users\t-lestersim\OneDrive - Microsoft\Documents\University Workshop Series\For Facilitator...

Content	Name	Extension	Date accessed	Date modified	Date created	Attributes	
Binary	Financial Sample - Canada.xlsx	.xlsx	2/10/2021 8:00:54 pm	13/9/2021 6:12:21 pm	30/9/2021 11:27:36 am	Record	C:\Users\t-lest
Binary	Financial Sample - France.xlsx	.xlsx	2/10/2021 8:01:22 pm	13/9/2021 6:12:54 pm	30/9/2021 11:27:36 am	Record	C:\Users\t-lest
Binary	Financial Sample - Germany.xlsx	.xlsx	2/10/2021 7:59:41 pm	13/9/2021 6:13:33 pm	30/9/2021 11:27:36 am	Record	C:\Users\t-lest
Binary	Financial Sample - Mexico.xlsx	.xlsx	2/10/2021 7:59:41 pm	13/9/2021 6:14:25 pm	30/9/2021 11:27:36 am	Record	C:\Users\t-lest
Binary	Financial Sample - USA.xlsx	.xlsx	2/10/2021 7:59:40 pm	13/9/2021 6:15:22 pm	30/9/2021 11:27:36 am	Record	C:\Users\t-lest

Combine Load Transform Data Cancel

- Select **Combine > Combine & Transform Data**. Select **Table1** as the sample file. Click Ok.

Combine Files

Select the object to be extracted from each file. [Learn more](#)

Sample File: First file

Display Options

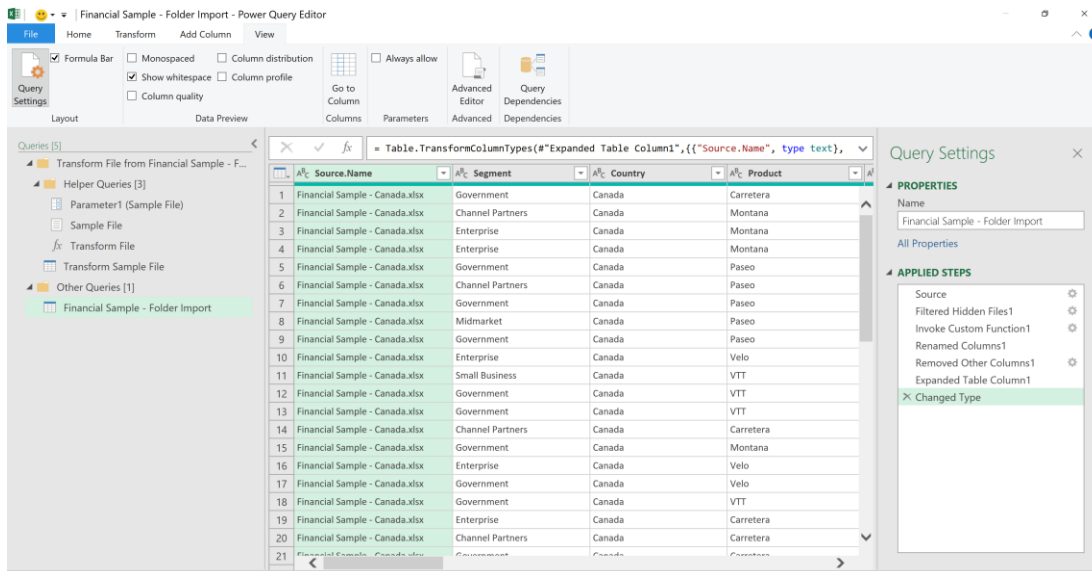
- Parameter1 [2]
- Table1
- Sheet1

Table1

Segment	Country	Product	Discount Band	Units Sold	M
Government	Canada	Carretera	None	1618.5	
Channel Partners	Canada	Montana	None	2518	
Enterprise	Canada	Montana	None	2665.5	
Enterprise	Canada	Montana	None	345	
Government	Canada	Paseo	None	292	
Channel Partners	Canada	Paseo	None	2516	
Government	Canada	Paseo	None	1725	
Midmarket	Canada	Paseo	None	2152	
Government	Canada	Paseo	None	1817	
Enterprise	Canada	Velo	None	345	
Small Business	Canada	VTT	None	2001	
Government	Canada	VTT	None	1817	
Government	Canada	VTT	Low	1326	
Channel Partners	Canada	Carretera	Low	1445	
Government	Canada	Montana	Low	1830	
Enterprise	Canada	Velo	Low	923	
Government	Canada	Velo	Low	2092	
Government	Canada	VTT	Low	943.5	
Enterprise	Canada	Carretera	Low	742.5	

☐ Skip files with errors OK Cancel

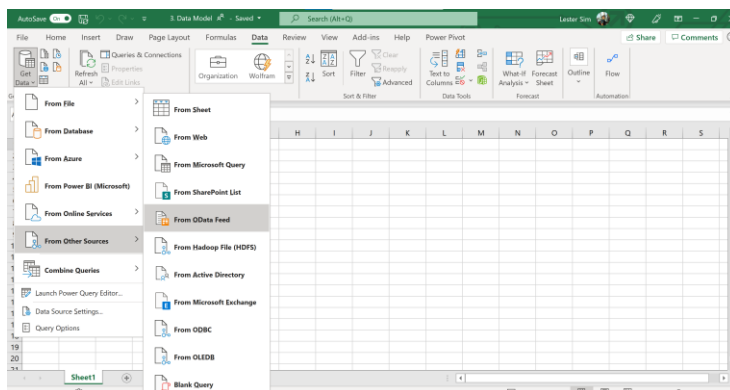
- You will see several supporting queries are created in the **Queries** pane under the "**Helper Queries**" group.



6. Power Query creates a **"Sample File"** query based on the example query.
7. A **"Transform File"** function query uses the "Parameter1" query to specify each file (or binary) as input to the "Sample File" query. This query also creates the Content column containing the file contents and automatically expands the structured Record column to add the column data to the results. The "Transform File" and "Sample File" queries are linked, so that changes to the "Sample File" query are reflected in the "Transform File" query.
8. The query containing the final results is in the "Other queries" group. By default, it is named after the folder you imported the files from.
9. Remove columns that you do not want to output from the **"Financial Sample – Folder Import"** query.
10. Now click **Close & Load**.

Merging Queries

1. Create a new worksheet.
2. Select **Data > Get Data > From Other Sources > From OData Feed**.



3. In the OData Feed dialog box, enter the URL for the Northwind OData feed:

<http://services.odata.org/northwind/northwind.svc/>

OData feed

☒ Basic ☐ Advanced

URL

<http://services.odata.org/northwind/northwind.svc/>

OK

Cancel

4. Select OK.

5. In the Navigator pane, check 'Select Multiple Items'. Select the tables: **Categories**, **Customers**, **Order_Details**, **Orders**, **Products**. Click **Transform Data**.

The screenshot shows the Power Query Navigator pane with the 'Select multiple items' checkbox checked. The following tables are selected: Categories, Customers, Order_Details, Orders, and Products. The 'Transform Data' button is visible at the bottom of the pane.

6. Do the following transformations for each of the tables you have just imported

- 6.1. Categories: Select **CategoryID**, **CategoryName**. Remove other columns
6.2. Customers: Select **CustomerID**, **Country**. Remove other columns
6.3. Products: Select **ProductID**, **ProductName**, **CategoryID**. Remove other columns
6.4. Order_Details: Select **OrderID**, **ProductID**, **UnitPrice**, **Quantity**. Remove other columns
6.4.1. Create custom column. New column name is Revenue. Formula as below

Custom Column

Add a column that is computed from the other columns.

New column name

Revenue

Custom column formula

= [UnitPrice] * [Quantity]

Available columns

OrderID
ProductID
UnitPrice
Quantity

Learn about Power Query formulas

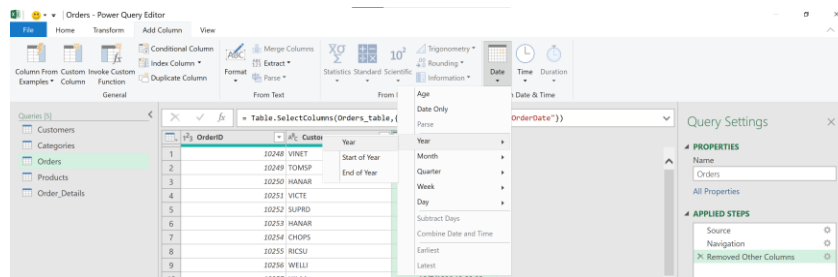
✓ No syntax errors have been detected.

OK

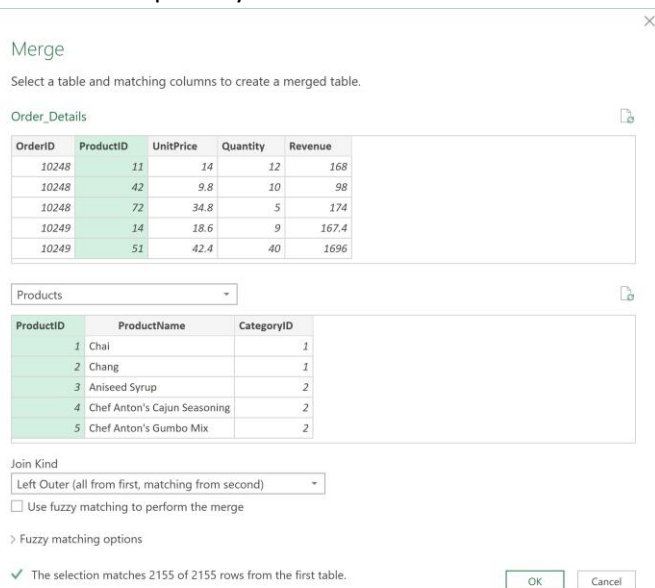
Cancel

- 6.5. Orders: Select **OrderID**, **CustomerID**, **OrderDate**. Remove other columns.

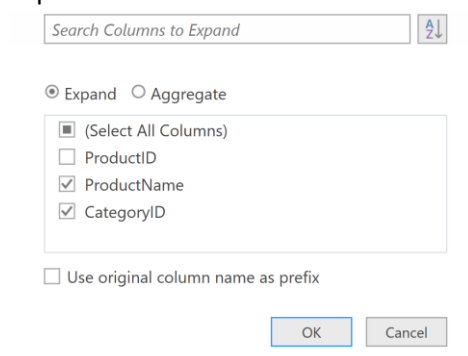
6.5.1. Select the OrderDate > Add Column > Date > Year > Year



7. Select the Order_Details table. We want to add product names into this table by merging with the Products table. Click on Merge Queries > Select Products as secondary table > Select ProductID column in the primary table > Select ProductID column in the secondary table.

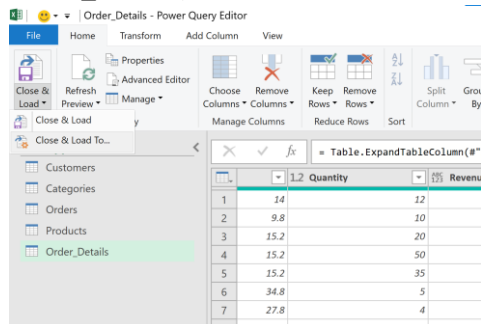


8. Select Left Outer for Join Kind. Click Ok.
9. Expand the Products table and check ProductName and CategoryID only.

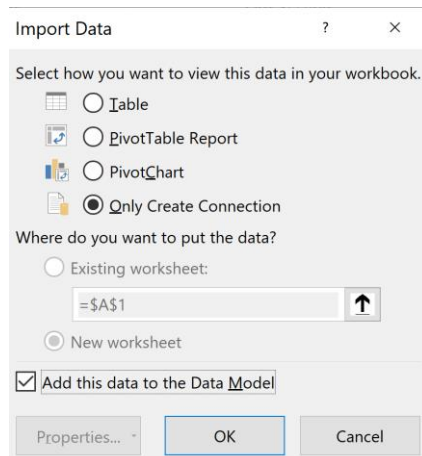


Power Pivot: Loading to Data Model & Create Relationships

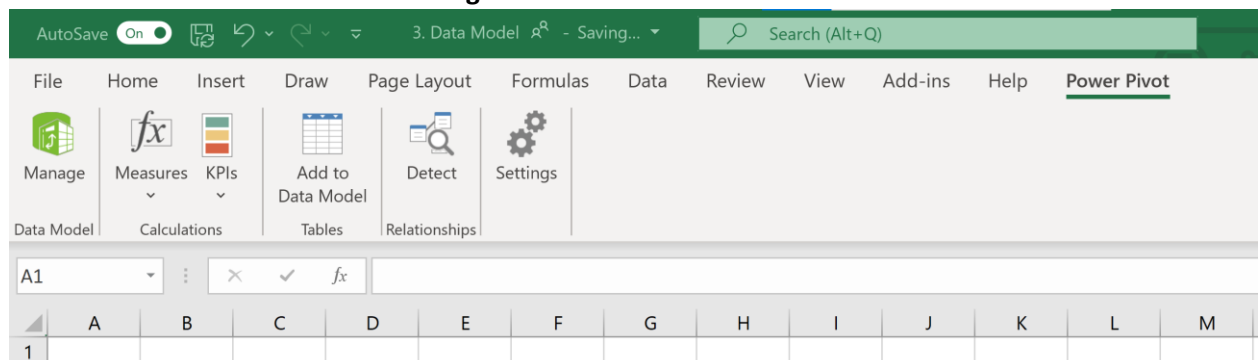
1. Instead of merging datasets, let's now load the 5 tables (**Customers, Categories, Orders, Products, Order_Details**). Select **Close & Load To**.



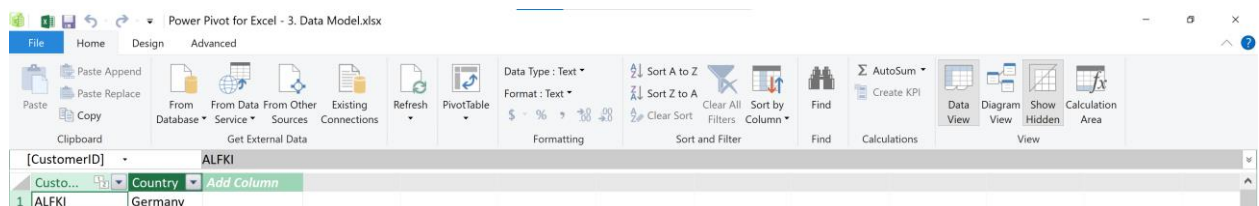
2. An **Import Data** window appears. Check **Only Create Connection** and check **Add this data to the Data Model**. Click **Ok**.



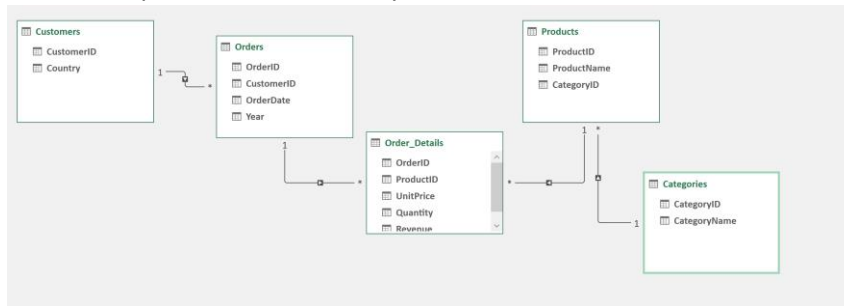
3. Select the **Power Pivot** ribbon > **Manage**



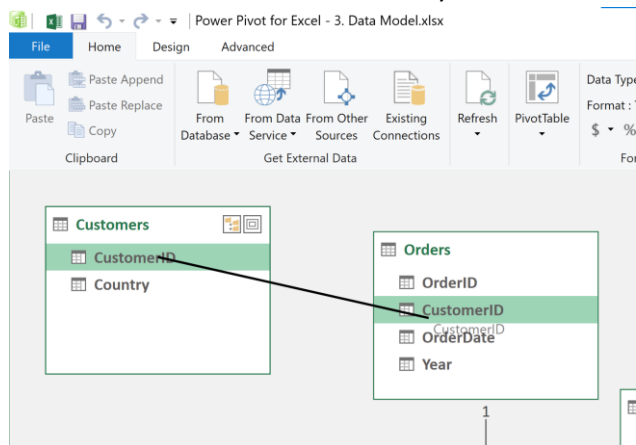
4. A Power Pivot window will appear containing the different tables as tabs.
5. We will now create relationships between tables. Select **Diagram View** at the top right of the window.



- Relationships were automatically detected between tables and established for us.

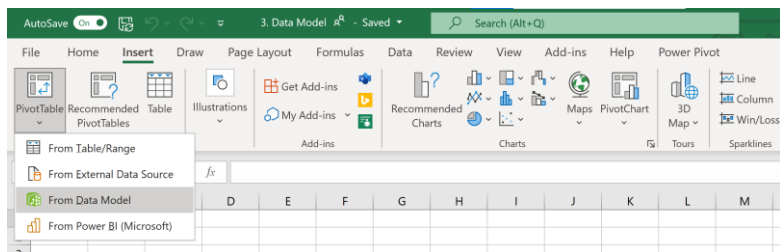


- Delete the relationship between **Customers** and **Orders** table. Right click on the relationship line > Delete. We will re-create the relationship next.
- To create a relationship, click on CustomerID from Customers table and drag to CustomerID from Orders table. Excel will automatically detect a 1:Many relationship between these 2 tables.



Power Pivot: Creating PivotTables from Data Model

- Close the Power Pivot window. On Excel click **Insert > Pivot Table > From Data Model**



- The PivotTable Fields now show the different tables being loaded.
- Let's create a PivotTable showing how the revenue for different category of products have changed over the years.
 - Drag **CategoryName** to Rows, **Year** to Columns, **Revenue** to Values.
- Let's create a PivotTable showing where our customers are spending the most in a specific year.
 - Drag **Year** to Filter, **Country** to Rows, **Revenue** to Values
 - Sort descending by Revenue
- Let's create a PivotTable showing how the quantity demanded for each product has change over the years.
 - Drag **ProductName** to Rows, **Year** to Columns, **Quantity** to Values.

References

<https://support.microsoft.com/en-us/office/import-data-from-external-data-sources-power-query-be4330b3-5356-486c-a168-b68e9e616f5a>

<https://support.microsoft.com/en-us/office/import-data-from-a-folder-with-multiple-files-power-query-94b8023c-2e66-4f6b-8c78-6a00041c90e4>

<https://support.microsoft.com/en-us/office/merge-queries-power-query-fd157620-5470-4c0f-b132-7ca2616d17f9>

<https://support.microsoft.com/en-us/office/create-a-fuzzy-match-power-query-ffdd5082-c0c8-4c8e-a794-bd3962b90649>

<https://docs.microsoft.com/en-us/power-query/pivot-columns>

<https://support.microsoft.com/en-us/office/unpivot-columns-power-query-0f7bad4b-9ea1-49c1-9d95-f588221c7098>