

# Power BI

# Data Modeling and Shaping

# Overview

**The estimated time to complete this lab is 3 hours and 45 minutes.**

In this lab you will learn how to upload multiple tables from a single data source. As well as create a new dimension for the model and enhance an existing dimension. You will learn how to create a fact table for a budget. You will also learn how to create parameters and a dynamic path to your data sources.

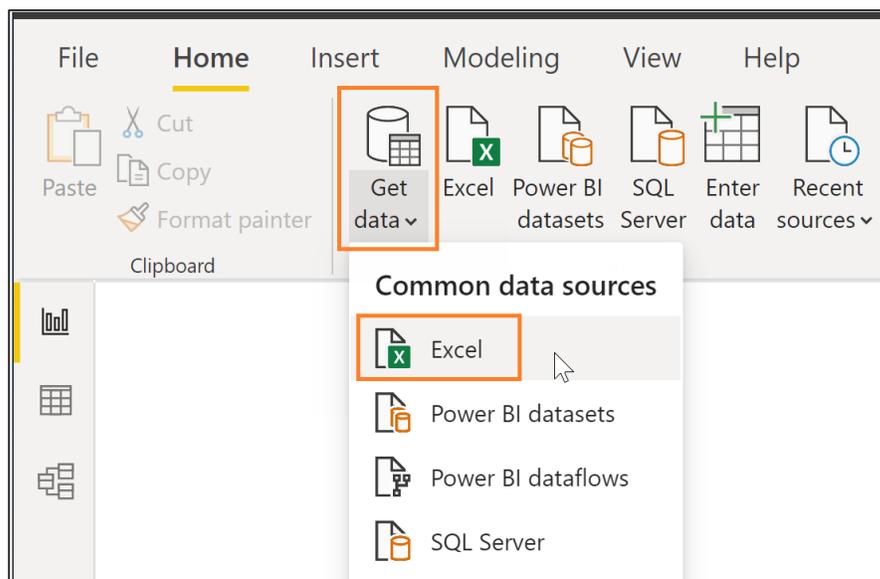
# Data Shaping Labs

## Lab 1a: Import multiple tables from a single source file

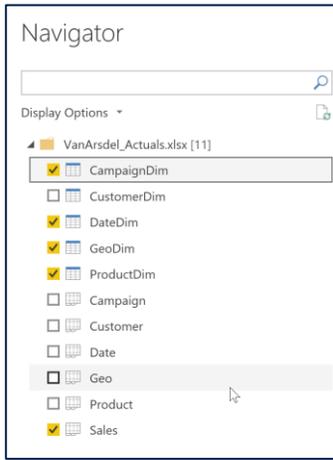
**Task:** Import multiple tables from a single excel source file.

**The estimated time to complete this lab is 15 minutes.**

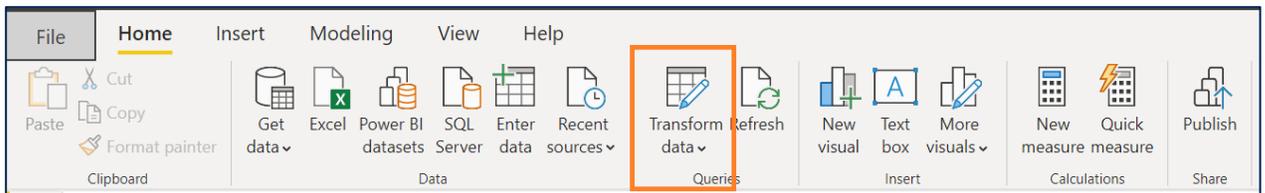
1. **GetData** > from Excel **C:\PowerBI\_Adv\_M\VansArsdel\_Actuals.xlsx**



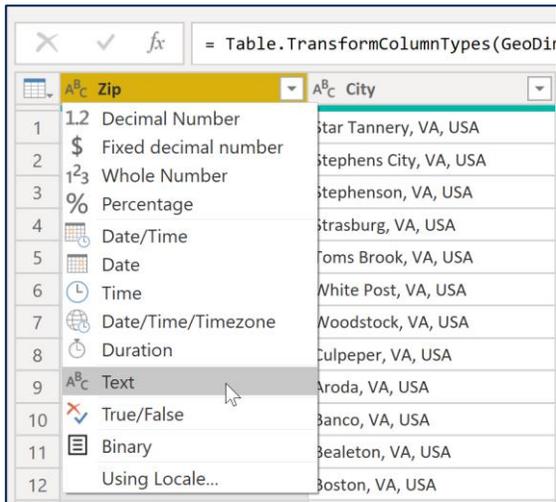
2. Select the following Tables (All but CustomerDim):
  - a. **CampaignDim**
  - b. **GeoDim**
  - c. **ProductDim**
  - d. **DateDim**
  - e. **Sales**



3. After tables are loaded click on **Transform Data**



4. In **GeoDim**, change the **Zip** data type to **Text**

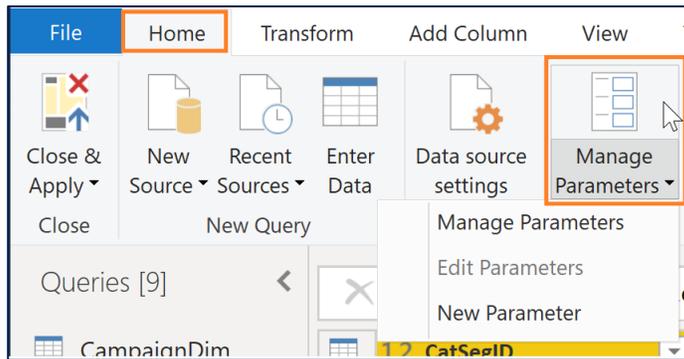


# Lab 1b: Create lab parameters

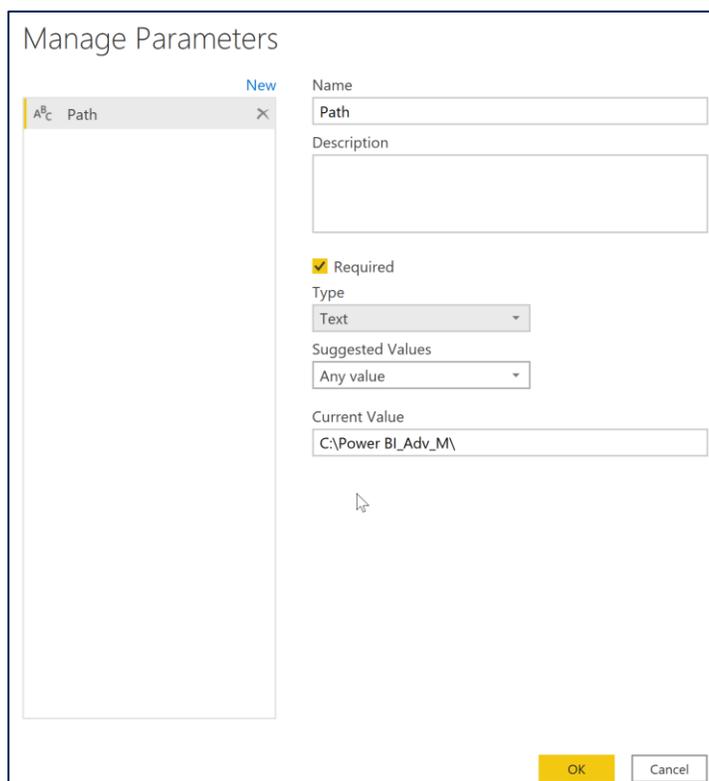
**Task:** Create new parameters

**The estimated time to complete this lab is 15 minutes.**

1. Click on **Transform Data**
2. From the **Home Ribbon > Manage Parameters**



3. Create a new **Parameter**
  - a. Parameter Name: **Path**
  - b. Type: **Text**
  - c. Current Value = **C:\Power BI\_Adv\_M\**



4. Create a new **Parameter**

- a. Parameter Name: **Actuals\_File**
- b. Type: **Text**
- c. Current Value = **VanArsdel\_Actuals.xlsx**

The screenshot shows the 'Manage Parameters' dialog box. On the left, there is a list of parameters with 'Actuals\_File' selected. The right side of the dialog contains the following fields and options:

- Name:** Actuals\_File
- Description:** (Empty text box)
- Required**
- Type:** Text (dropdown menu)
- Suggested Values:** Any value (dropdown menu)
- Current Value:** VanArsdel\_Actuals.xlsx

At the bottom right, there are 'OK' and 'Cancel' buttons.

5. Create a new **Parameter**

- a. Parameter Name: **Budget\_File**
- b. Type: **Text**
- c. Current Value = **VanArsdel\_Budget.csv**

Manage Parameters

New

- Path
- Actuals\_File
- Budget\_File** ✕

Name  
Budget\_File

Description

Required

Type  
Text

Suggested Values  
Any value

Current Value  
VanArsdel\_Budget.csv

OK Cancel

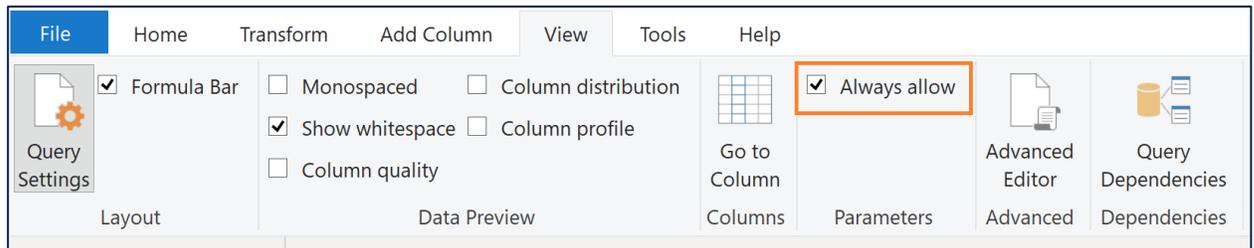
6. Update the text files to ensure the parameter names are consistent

# Lab 2a: Create CatSegDim

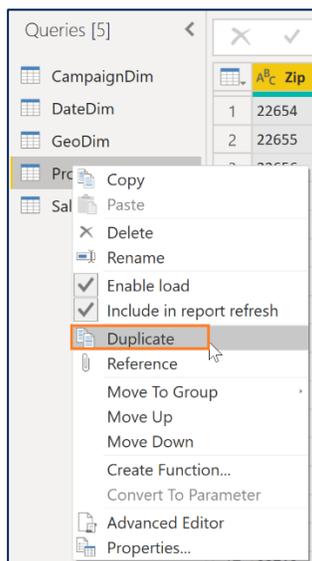
**Task:** Create a dimension using Category and Segment attributes from the Product dimension

**The estimated time to complete this lab is 30 minutes.**

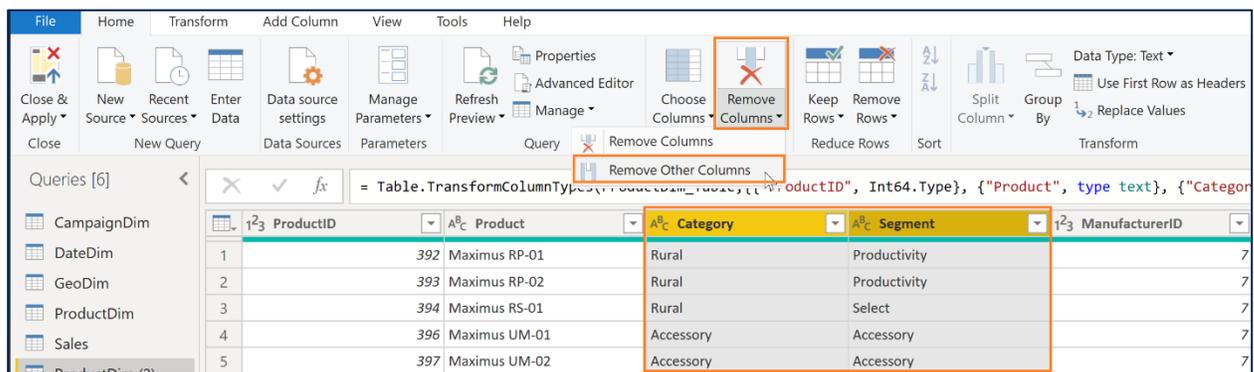
1. From the **View** ribbon check **"Always Allow"**



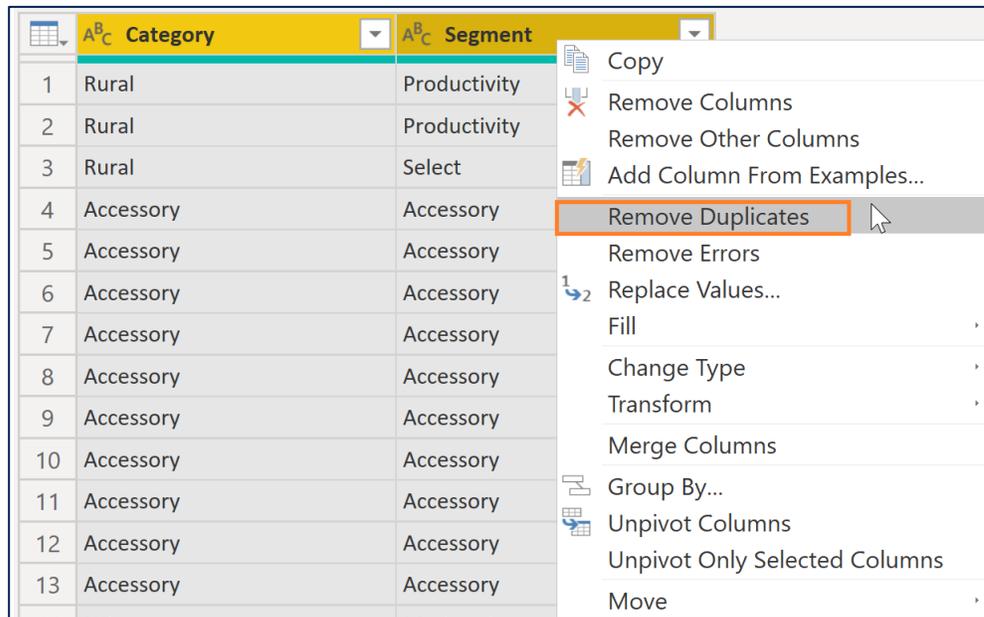
2. **Duplicate** the **ProductDim** query



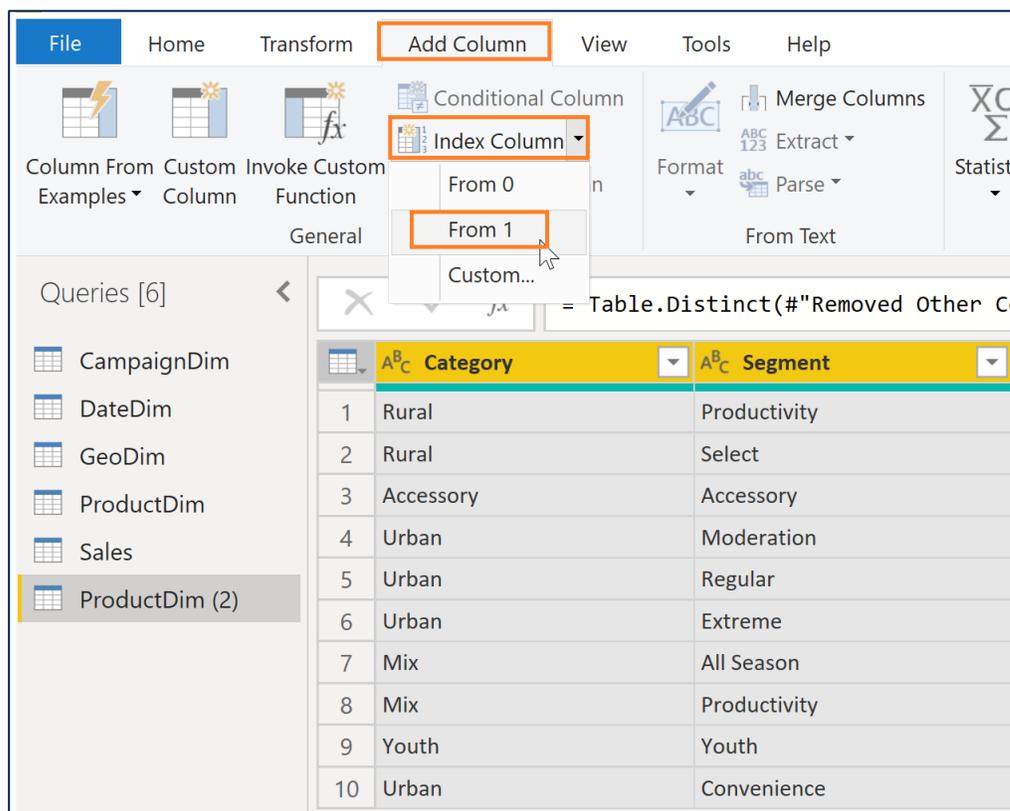
3. Highlight **Category** and **Segment**, and **Remove other columns**



#### 4. Highlight **Category** and **Segment**, and **Remove Duplicates**



#### 5. **Add Column**> Add **Index** Column starting at 1, with column name **CatSegID**



#### 6. Reorder Columns: **CatSegID**, **Category**, **Segment**

1.2 CatSegID	A <sup>B</sup> <sub>C</sub> Category	A <sup>B</sup> <sub>C</sub> Segment
1	Rural	Productivity
2	Rural	Select
3	Accessory	Accessory
4	Urban	Moderation
5	Urban	Regular
6	Urban	Extreme
7	Mix	All Season
8	Mix	Productivity
9	Youth	Youth
10	Urban	Convenience

7. Rename the query "CatSegDim"

Queries [6] <

- CampaignDim
- DateDim
- GeoDim
- ProductDim
- Sales
- CatSegDim**

fx = Table.RenameColumns("#Reordered Columns",{"CatSegID", "Ca

1.2 CatSegDim	A <sup>B</sup> <sub>C</sub> Category	A <sup>B</sup> <sub>C</sub> Segment
1	1 Rural	Productivity
2	2 Rural	Select
3	3 Accessory	Accessory
4	4 Urban	Moderation
5	5 Urban	Regular
6	6 Urban	Extreme
7	7 Mix	All Season
8	8 Mix	Productivity
9	9 Youth	Youth
10	10 Urban	Convenience

# Lab 2b: Update Product dimension

**Task:** Update the Product dimension

**The estimated time to complete this lab is 15 minutes.**

1. Select the **ProductDim** query
2. From **Home Ribbon > Merge Queries > Select CatSegDim**
  - a. From **ProductDim**, highlight **Category** and **Segment**
  - b. From **CatSegDim**, highlight **Category** and **Segment**
  - c. Note the Join Kinds available, and leave **Left Outer**

Merge

Select a table and matching columns to create a merged table.

ProductDim

ProductID	Product	Category 1	Segment 2	ManufacturerID	Manufacturer	Unit Cost	Unit Price
392	Maximus RP-01	Rural	Productivity	7	VanArsdel	37.2710625	51.0562
393	Maximus RP-02	Rural	Productivity	7	VanArsdel	37.2710625	51.0562
394	Maximus RS-01	Rural	Select	7	VanArsdel	119.7617925	164.0572
396	Maximus UM-01	Accessory	Accessory	7	VanArsdel	66.2830875	90.7987

CatSegDim

CatSegDim	Category 1	Segment 2
1	Rural	Productivity
2	Rural	Select
3	Accessory	Accessory
4	Urban	Moderation
5	Urban	Regular

Join Kind

Left Outer (all from first, matching from second)

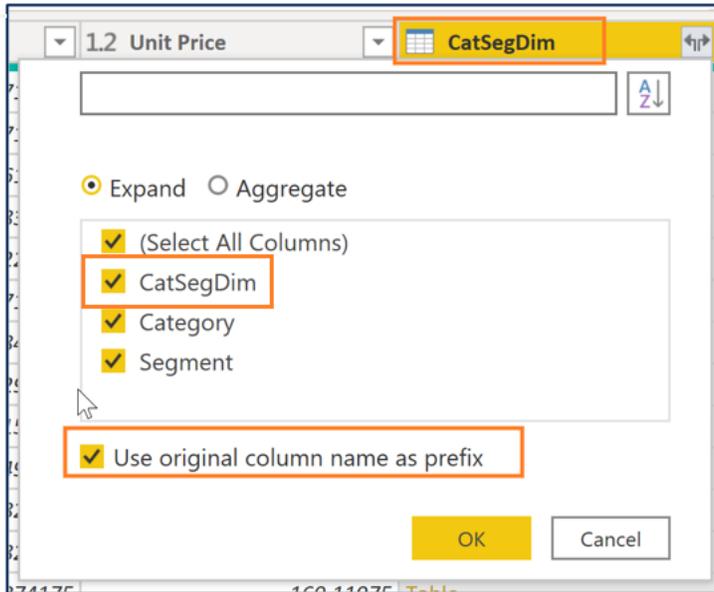
Use fuzzy matching to perform the merge

> Fuzzy matching options

✓ The selection matches 212 of 212 rows from the first table.

OK Cancel

- d. Expand the **NewColumn** > Select **CatSegID** and deselect **“Use Original column name as prefix”**



3. Remove columns: **Manufacturer ID**, and **Manufacturer**.
  - a. **Hint:** There is only one manufacturer name and one manufacturer ID, so we don't need this information!
4. Reorder columns: **ProductID**, **Product**, **CatSegID**, **Unit Price**, **Unit Cost**, **Category**, **Segment**

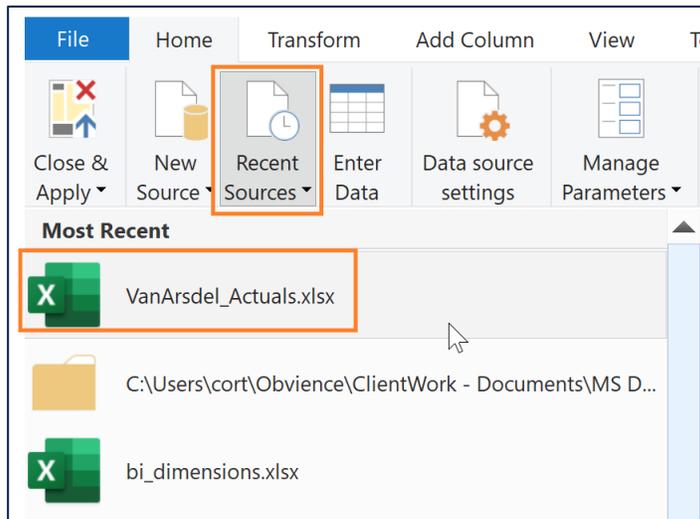
	1.2 ProductID	1.2 CatSegID	A <sup>B</sup> C Product	1.2 Unit Price	1.2 Unit Cost
1		392	1 Maximus RP-01	51.05625	37.2710625
2		393	1 Maximus RP-02	51.05625	37.2710625
3		394	2 Maximus RS-01	164.05725	119.7617925
4		396	3 Maximus UM-01	90.79875	66.2830875
5		397	3 Maximus UM-02	149.61975	109.2224175

# Lab 2c: Create Customer dimension

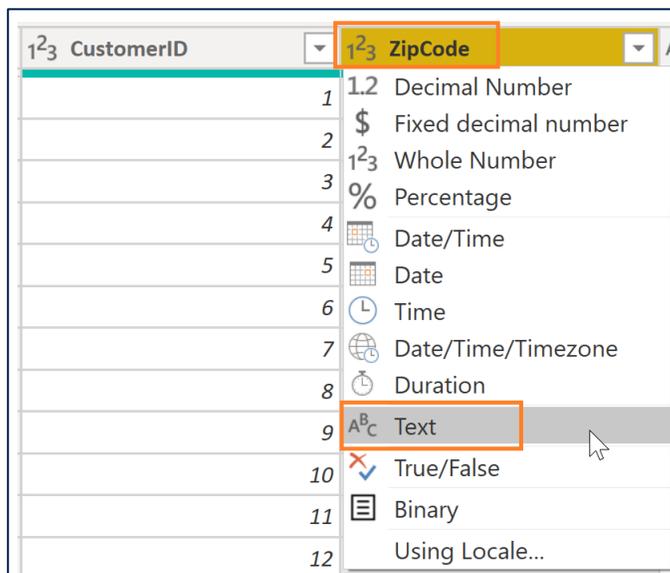
**Task:** Create a Customer dimension

**The estimated time to complete this lab is 30 minutes.**

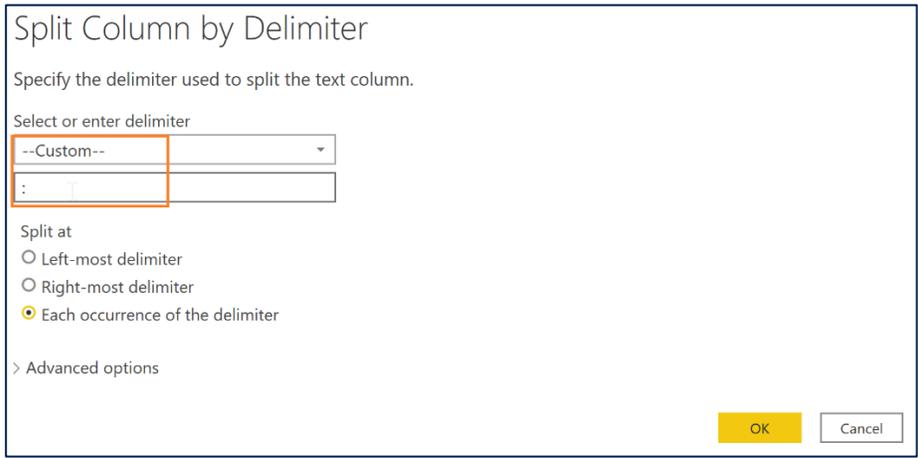
1. Use **Recent Sources** to get **CustomerDim** from Excel



2. Change the **ZipCode** column data type to **Text**

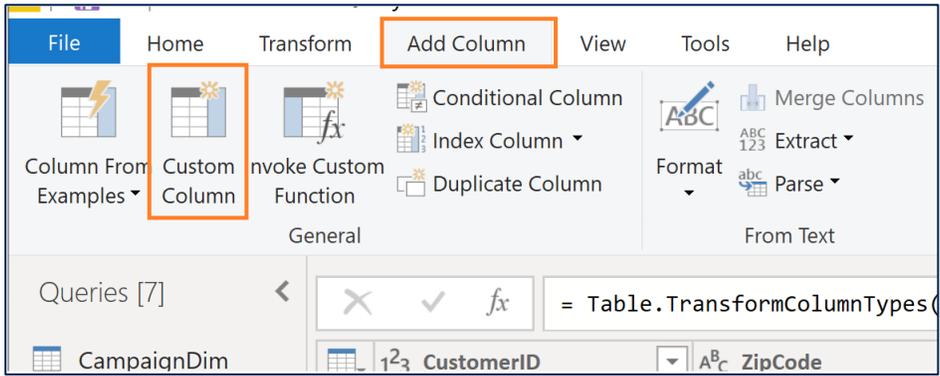


3. Split **Email Name** by Delimiter Custom": " (colon space)



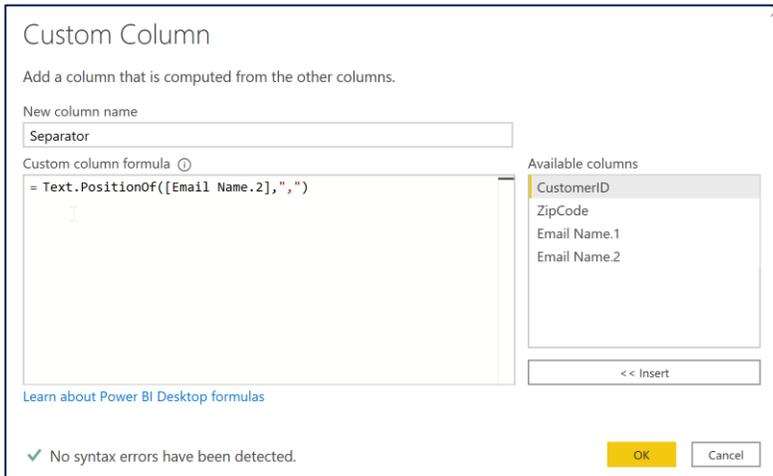
4. **Add Column** to find Text.PositionOf() the comma

a. **Add Column > Custom Column**



b. Name = **"Separator"**

c. Formula = **Text.PositionOf([Email Name.2], ", ")**



5. Use position of comma to split **Last Name** and **First Name**

6. **Add Columns** for **First Name, Last Name and Full Name**

- a. Last Name = ***Text.Start([Email Name.2], [Separator])***
- b. First Name = ***Text.Range([Email Name.2],[Separator]+2)***
- c. Full Name = ***[First Name] & " " & [Last Name]***

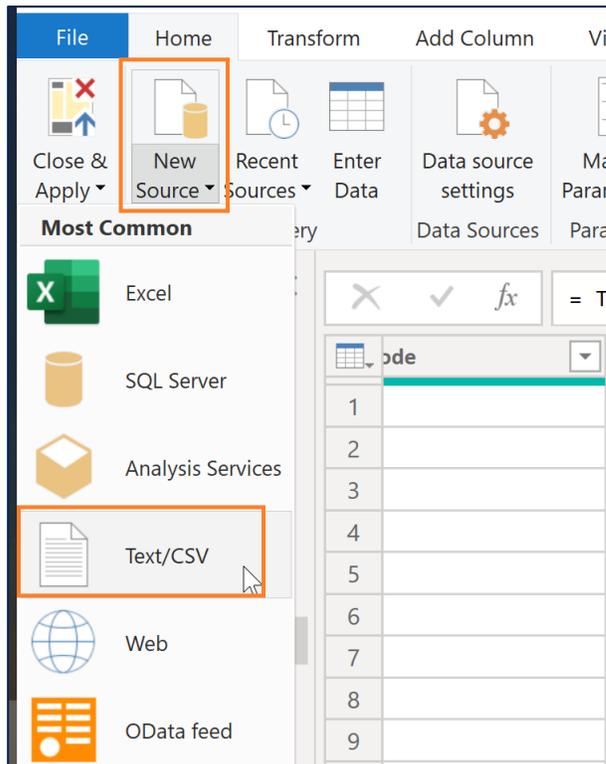
7. Remove **Separator** column

# Lab 2d: Create Budget Fact table

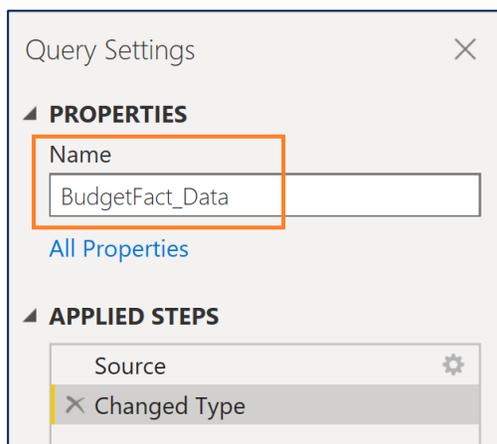
**Task:** Create Budget fact table

**The estimated time to complete this lab is 45 minutes.**

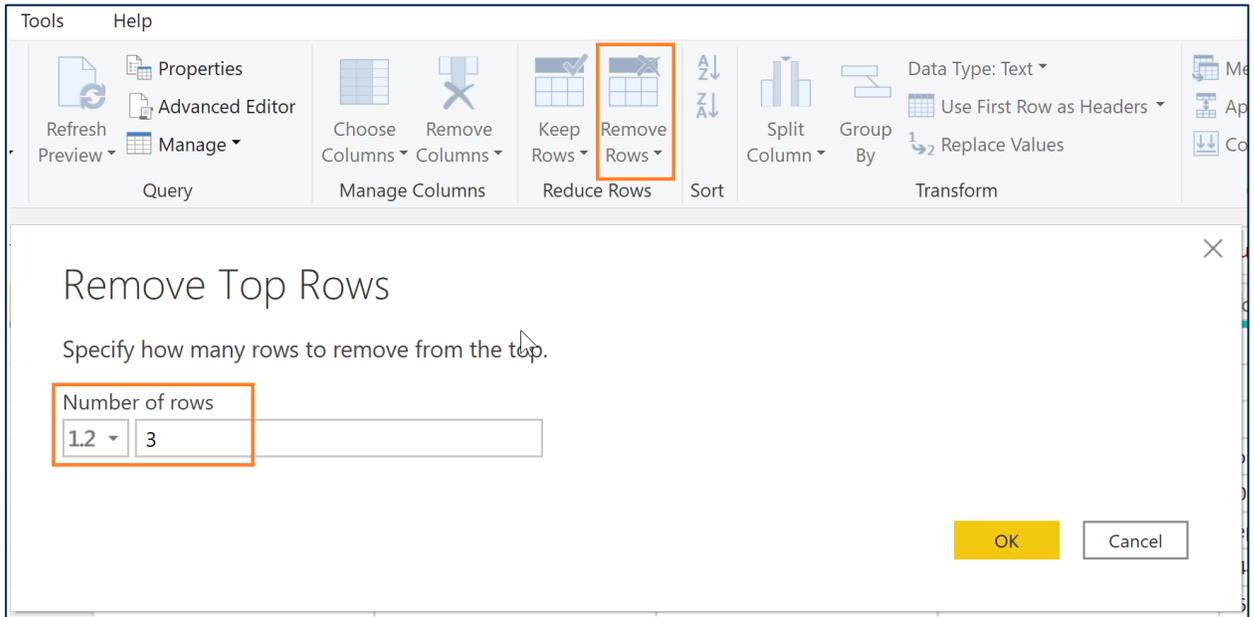
1. Import CSV document “**C:/Power BI Adv\_M/VanArsdel\_Budget.csv**”



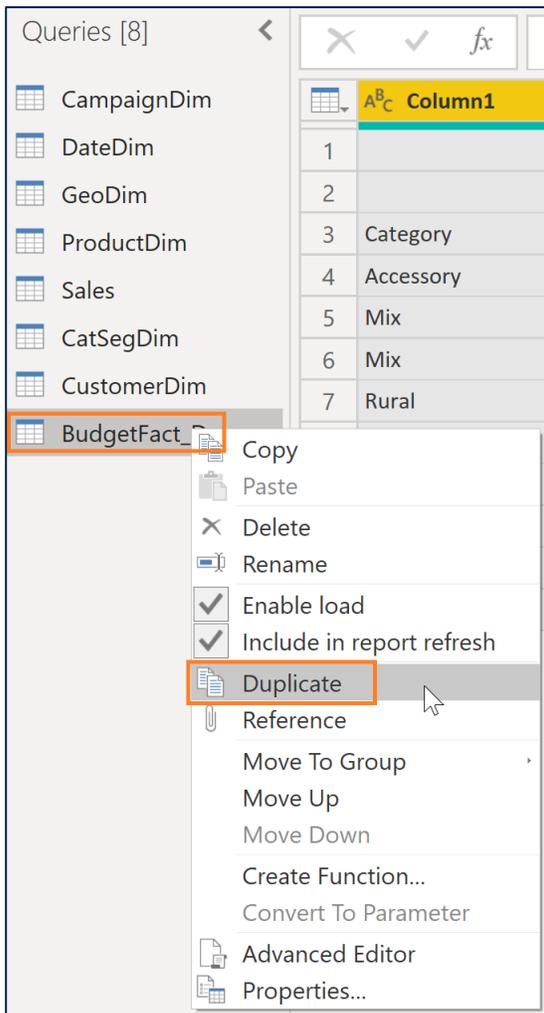
2. Rename query from **VanArsdel\_Budget** to **BudgetFact\_Data**



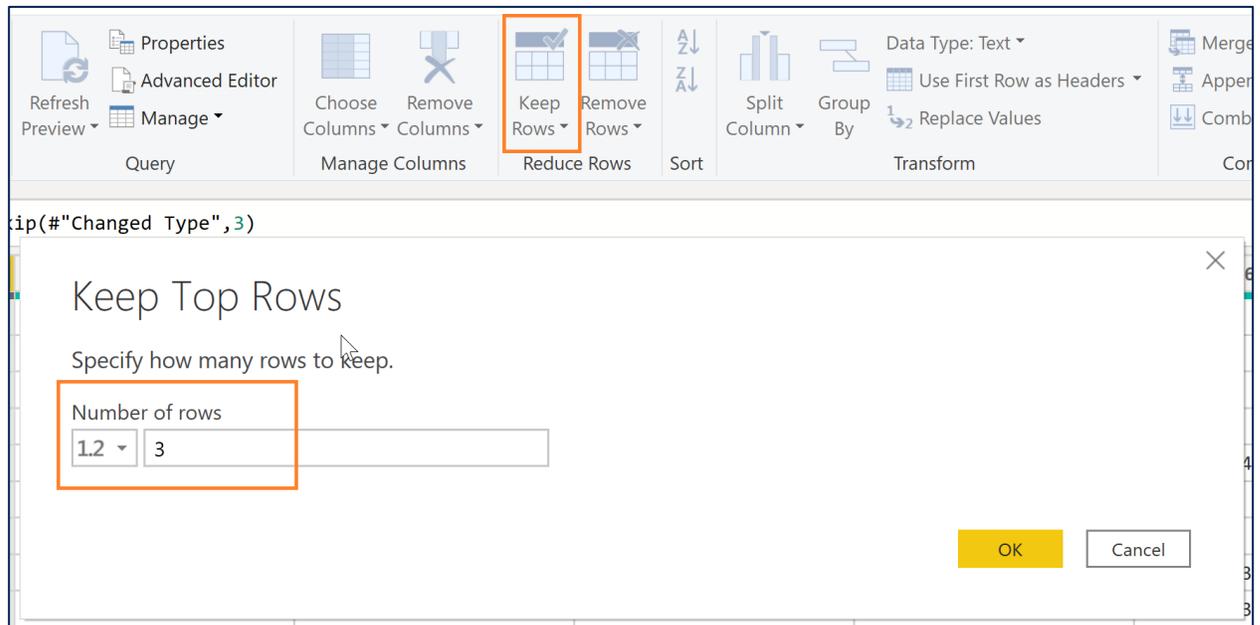
3. **Remove Rows** > Remove Top Rows, enter 3 (to remove the first 3 rows)



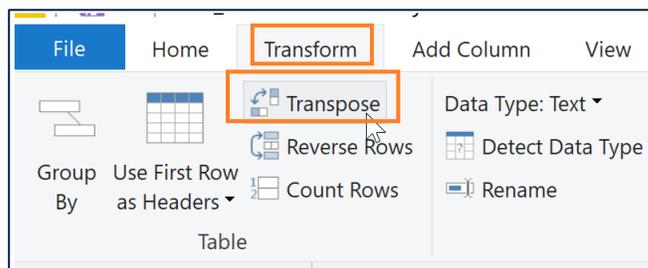
4. **Duplicate** query **BudgetFact\_Data** rename to **"BudgetFact"**



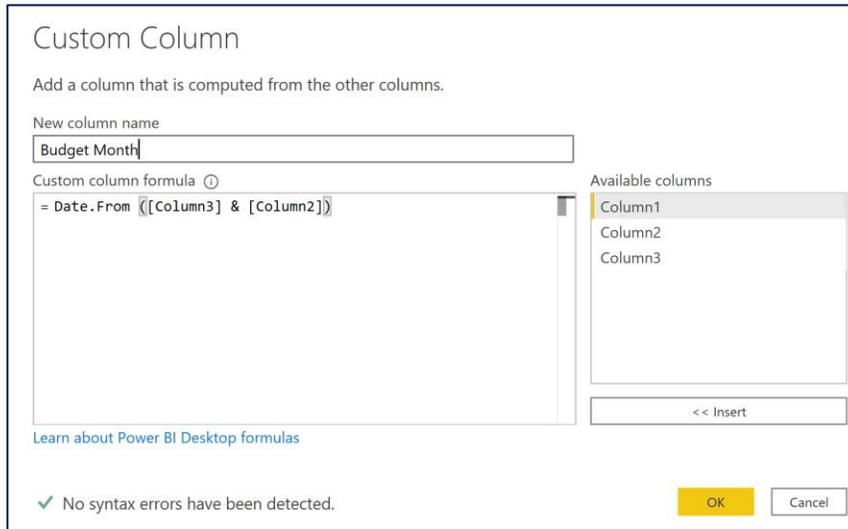
5. **Keep Rows** > Keep Top Rows, enter 3 (to keep the first three rows)



6. **Transform** > **Transpose**

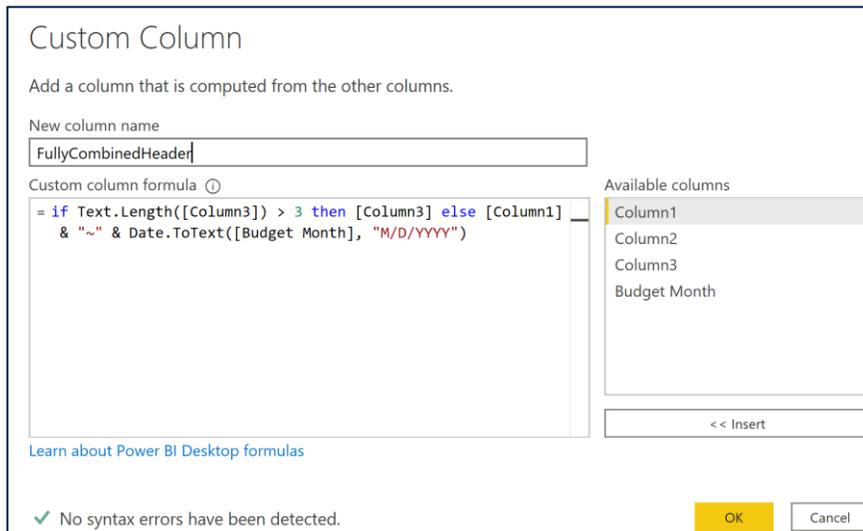


7. **Add Column** to combine month and year into a date a
- Add Column > **Custom Column**
  - Name = "**Budget Month**"
  - Formula = ***Date.From ([Column3] & [Column2])***

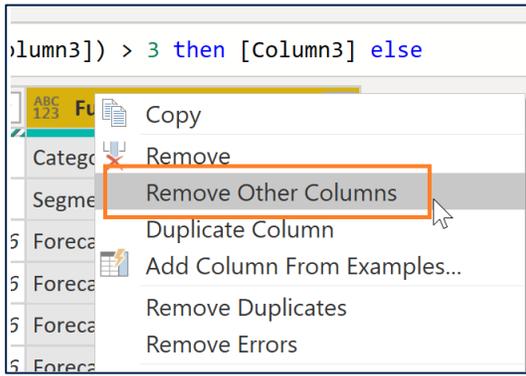


8. **Add Column** to combine Month and Scenario

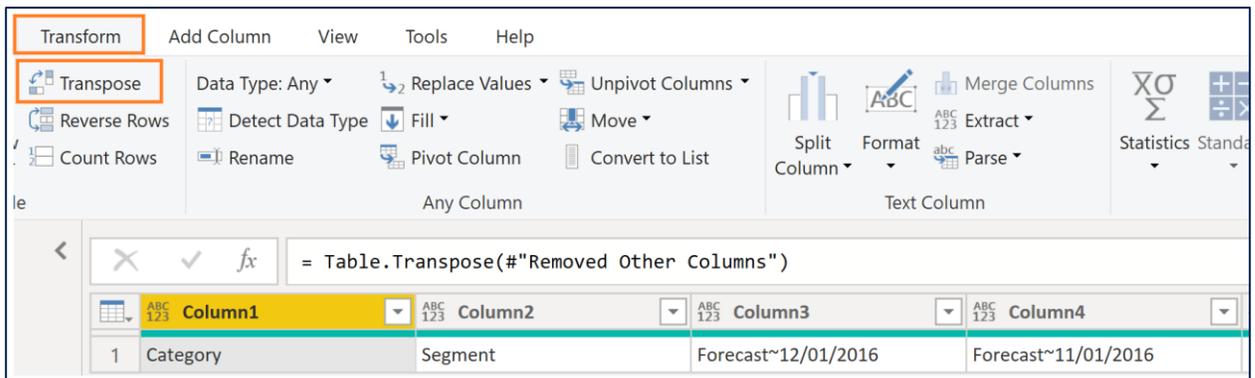
- d. Add Column > **Custom Column**
- e. Name = **"FullyCombinedHeader"**
- f. Formula = ***if Text.Length([Column3]) > 3 then [Column3] else [Column1] & "~" & Date.ToText([Budget Month], "M/D/YYYY")***
- g. **Hint:** Day did not come through correctly, as it is case sensitive. Update to "MM/dd/yy"



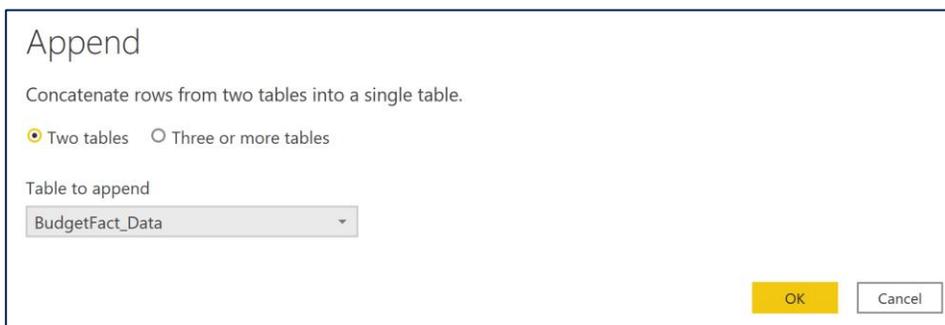
9. **Remove all** columns except for **FullyCombinedHeader**



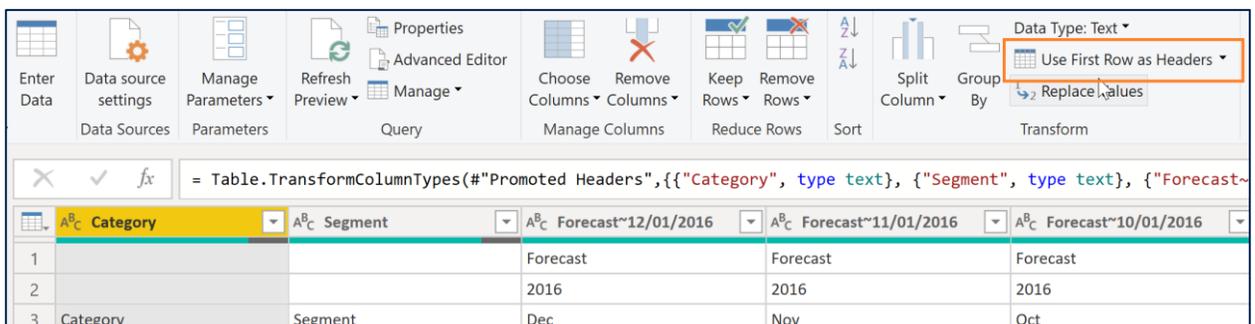
10. **Transform** > **Transpose** to transpose back to wide



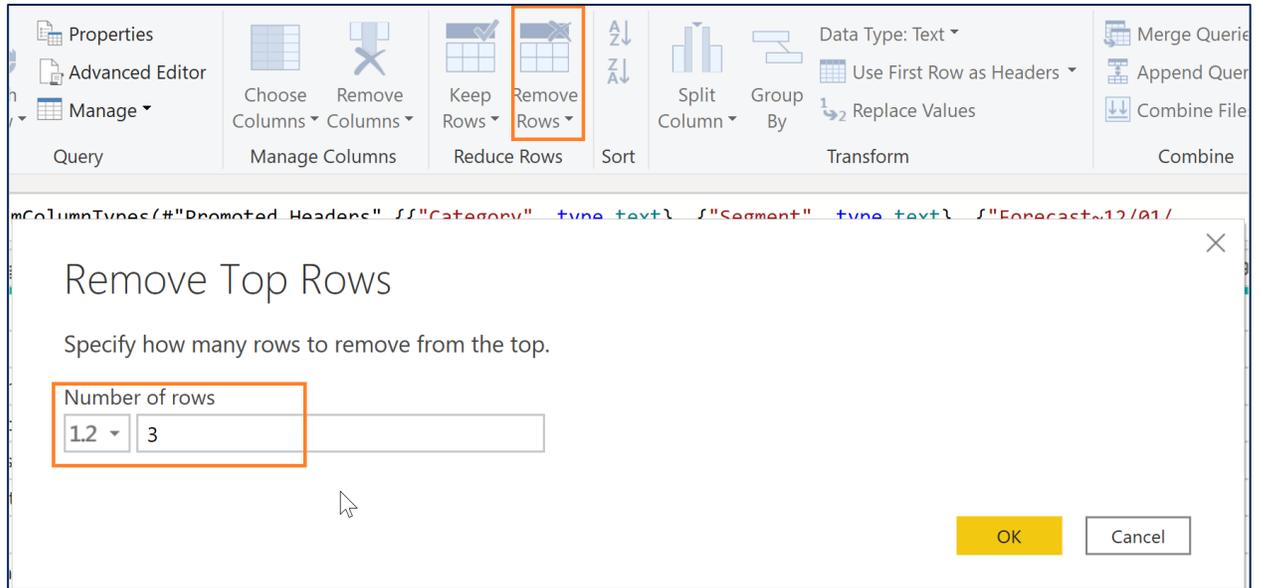
11. **Append** query **BudgetFact\_Data**



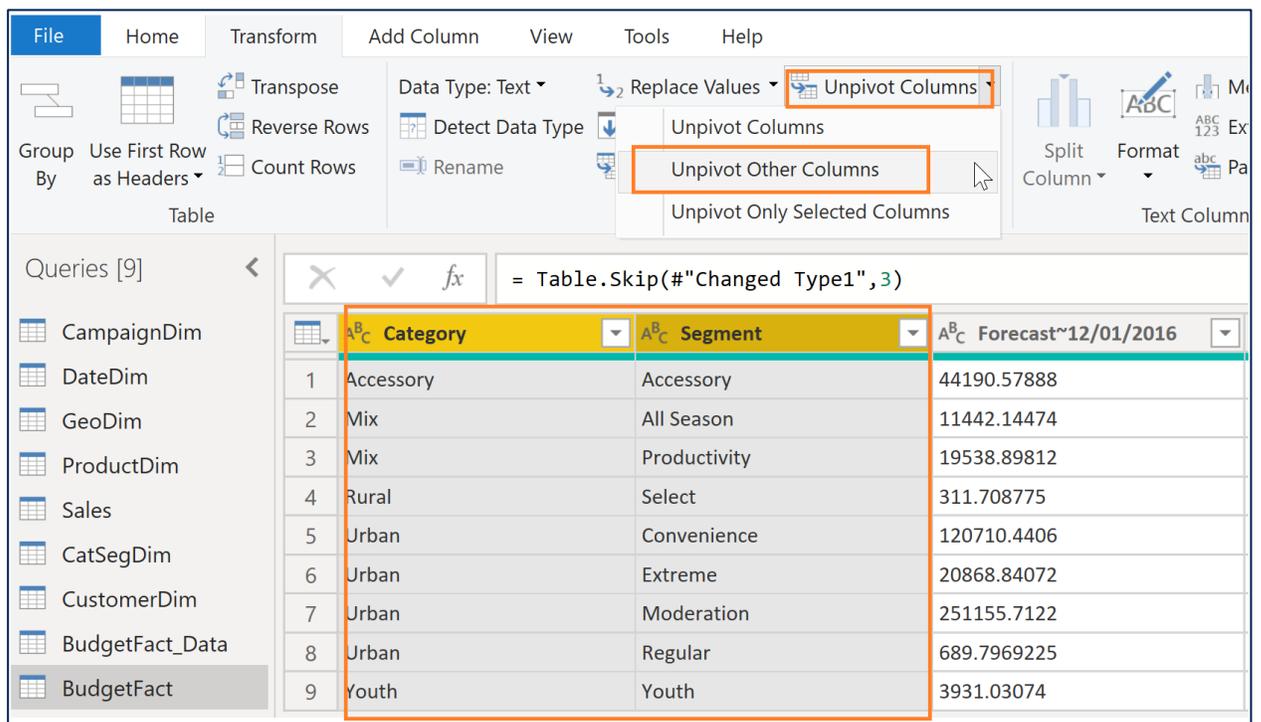
12. **Use First Row as Header** to promote the newly fixed header row



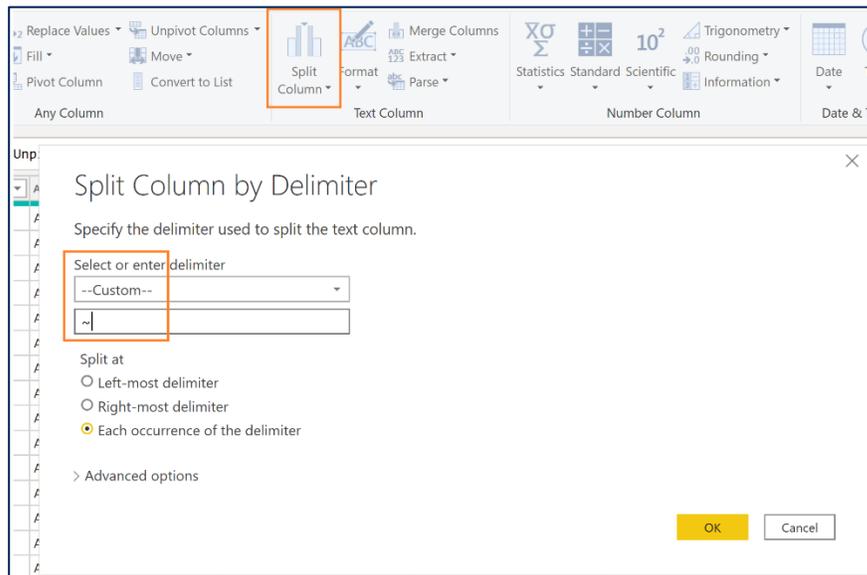
13. **Remove Rows** > Remove Top Rows, enter 3 (to remove the first 3 rows – the old header rows)



14. Highlight **Category** and **Segment** and **Transform** > **Unpivot Other Columns**



15. Highlight **Attribute** and navigate to **Home** > **Split Column** > By Delimiter > "~"



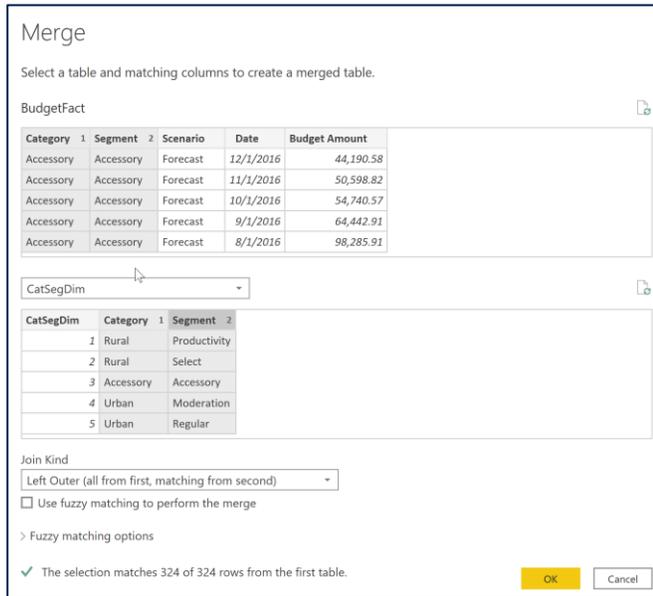
16. Rename: Attribute.1 = **"Scenario"**, Attribute.2 = **"Date"**, Value = **"Budget Amount"**

A <sup>B</sup> C Scenario	Date	A <sup>B</sup> C Budget Amount
Forecast	12/1/2016	44190.57888
Forecast	11/1/2016	50598.81566
Forecast	10/1/2016	54740.5709

17. Change the Data Types: **Budget Amount = Fixed Decimal, Date = Date**

18. **Home > Merge Queries > Select CatSegDim**

- h. a) From the CatSegDim highlight both **Category** and **Segment**
- i. b) Go back up to BudgetFact, highlight both **Category** and **Segment**
- j. c) Show the Join Kinds available, and leave **"Left Outer"**
- k. d) Expand NewColumn > Select **"CatSegID"** and deselect **"Use Original column name as prefix"**

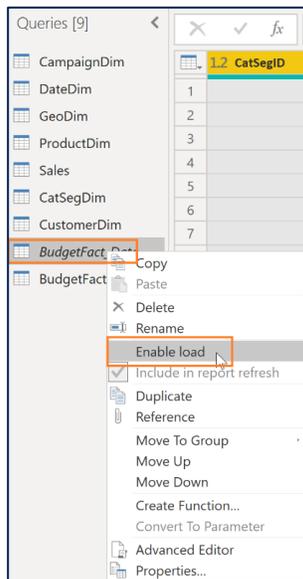


19. Remove: **Category, Segment**

20. Reorder: **CatSegID, Scenario, Date, Budget Amount**

	1.2 CatSegID	A <sup>B</sup> C Scenario	Date	\$ Budget Amount
1		3 Forecast	12/1/2016	44,190.58
2		3 Forecast	11/1/2016	50,598.82
3		3 Forecast	10/1/2016	54,740.57

21. **Disable** the load of **BudgetFact\_Data**

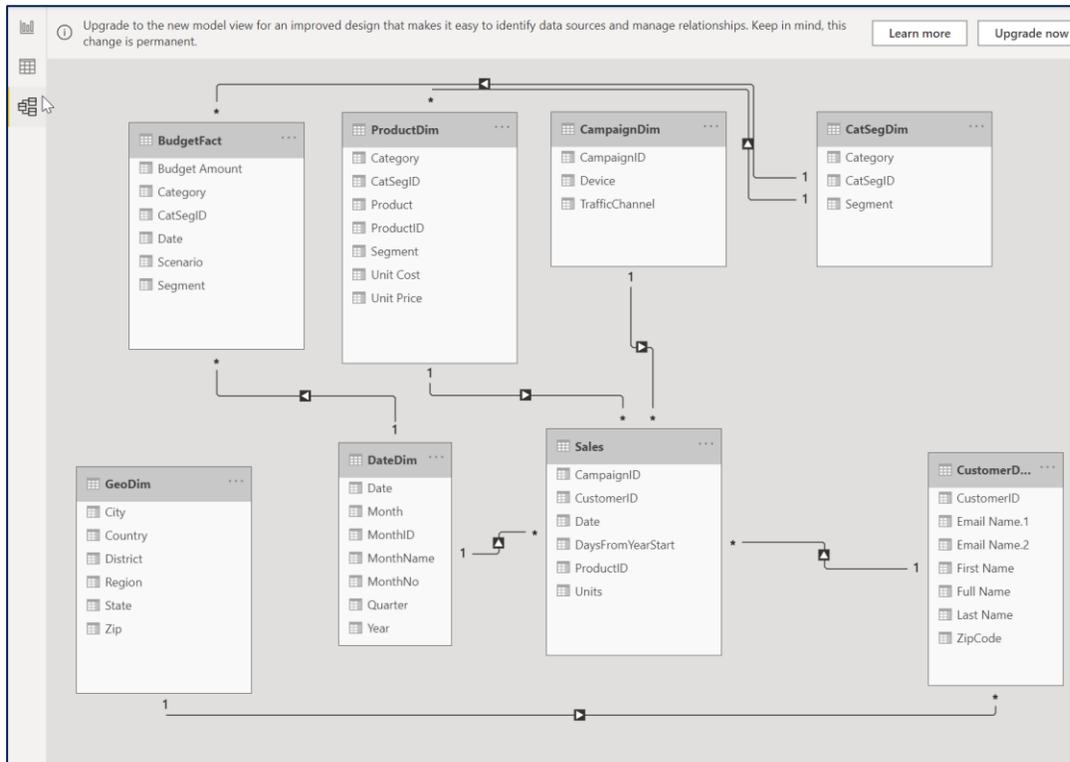


# Lab 3: Create relationships between tables

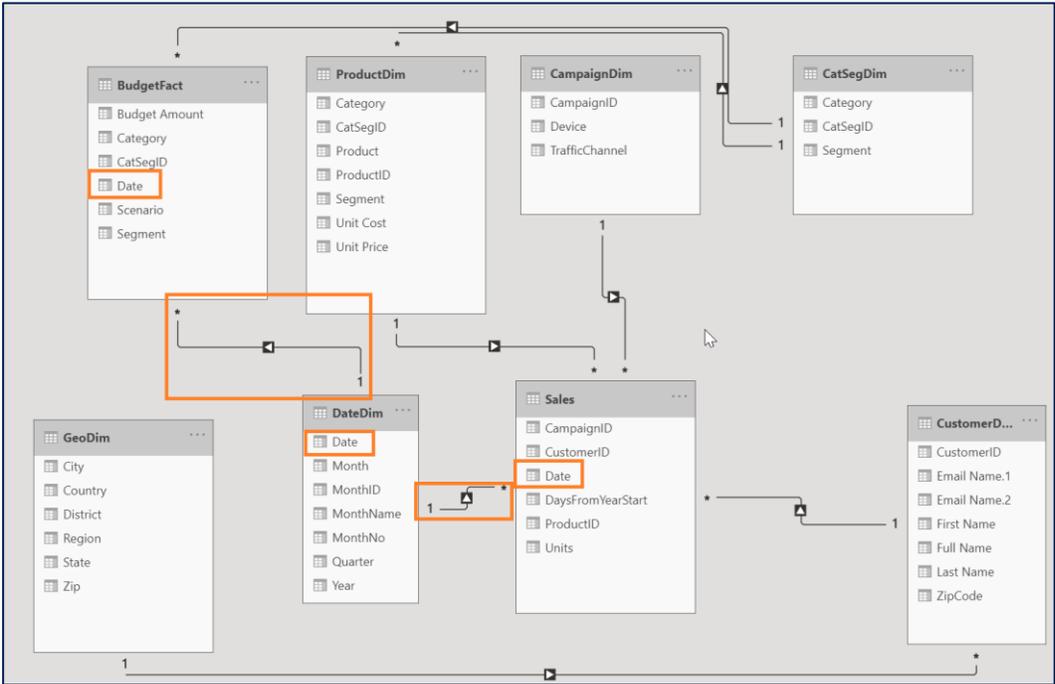
**Task:** Create relationships between multiple tables.

**The estimated time to complete this lab is 20 minutes.**

1. Navigate to **model** view.



2. Drag a **relationship** line between **Date** field from **Sales** table to **Date** field from **DateDim** table, create the same relationship between the **Date** table and the **BudgetFact** table

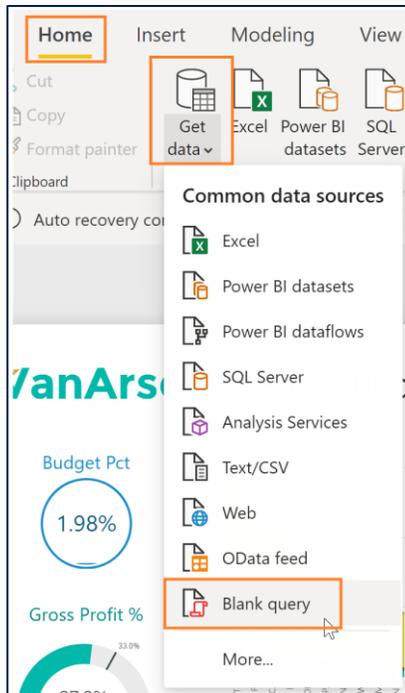


# Lab 4a: Create dynamic path to excel source file

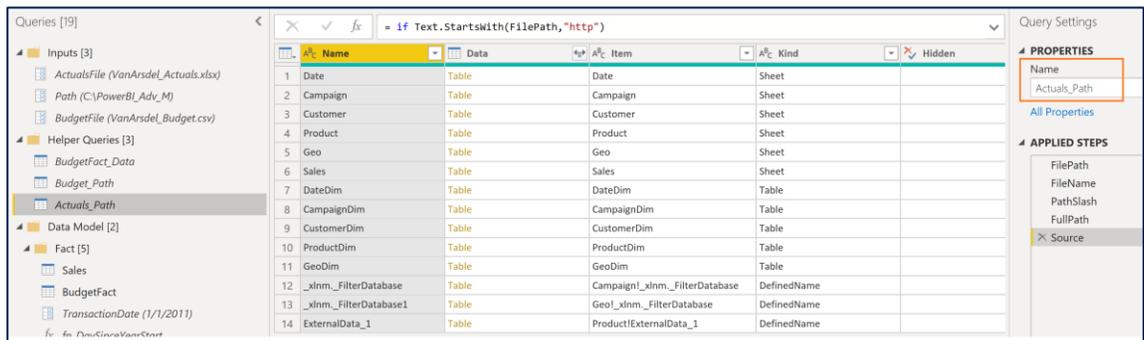
**Task:** Create a dynamic path to the excel source file

**The estimated time to complete this lab is 15 minutes.**

1. Create a new blank query
  - a) Query Name: "Actuals\_Path"



- b) Copy in text from the file Actuals\_Path.txt



2. Update Source Applied Step to use Resolved Path = "Actuals\_Path" to the following Queries: • CampaignDim • CustomerDim • ProductDim • CatSegDim • Date • GeoDim • Sales

Queries [19]

- Inputs [3]
  - ActualsFile (VanArsdel\_Actuals.xlsx)
  - Path (C:\PowerBI\_Adv\_M)
  - BudgetFile (VanArsdel\_Budget.csv)
- Helper Queries [3]
  - BudgetFact\_Data
  - Budget\_Path
  - Actuals\_Path
- Data Model [2]
  - Fact [5]
    - Sales
    - BudgetFact
    - TransactionDate (1/1/2011)
    - fn\_DaySinceYearStart
    - Query2
  - Dimensions [6]
    - CampaignDim
    - DateDim
    - GeoDim
    - ProductDim
    - CatSegDim

Query Settings: = Actuals\_Path

ID	Name	Data	Item	Kind	Hidden
1	Date	Table	Date	Sheet	
2	Campaign	Table	Campaign	Sheet	
3	Customer	Table	Customer	Sheet	
4	Product	Table	Product	Sheet	
5	Geo	Table	Geo	Sheet	
6	Sales	Table	Sales	Sheet	
7	DateDim	Table	DateDim	Table	
8	CampaignDim	Table	CampaignDim	Table	
9	CustomerDim	Table	CustomerDim	Table	
10	ProductDim	Table	ProductDim	Table	
11	GeoDim	Table	GeoDim	Table	
12	_xlnm_FilterDatabase	Table	Campaign_xlnm_FilterDatabase	DefinedName	
13	_xlnm_FilterDatabase1	Table	Geo_xlnm_FilterDatabase	DefinedName	
14	ExternalData_1	Table	Product!ExternalData_1	DefinedName	

Query Settings: Name: CampaignDim

APPLIED STEPS: Source

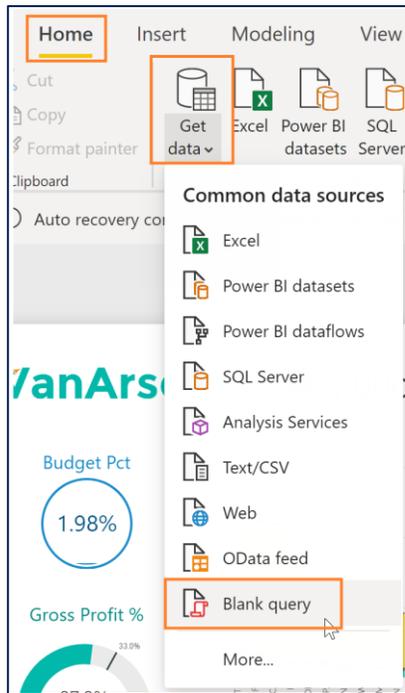
Navigation Changed Type

# Lab 4b: Create dynamic path to csv source file

**Task:** Create a dynamic path to csv source file

**The estimated time to complete this lab is 15 minutes.**

1. Create a new blank query a) Query Name: "Budget\_Path"



2. Copy in text from Budget\_Path.txt

The screenshot shows a Power BI query editor. The formula bar contains the DAX formula: `= if Text.StartsWith(FilePath,"http")`. The table below has 5 columns: Column1, Column2, Column3, Column4, and Column5. The data is as follows:

	Column1	Column2	Column3	Column4	Column5
1	Budget Spreadsheet for VanArsdel				
2					
3					
4			Forecast	Forecast	Forecast
5			2016	2016	2016
6	Category	Segment	Dec	Nov	Oct
7	Accessory	Accessory	44190.57888	50598.81566	54740.5709
8	Mix	All Season	11442.14474	14120.78693	18109.64804
9	Mix	Productivity	19538.89812	17597.55926	22835.18396
10	Rural	Select	311.708775	172.2601125	662.79129
11	Urban	Convenience	120710.4406	129923.2814	169468.7696
12	Urban	Extreme	20868.84072	46971.33037	70793.02886
13	Urban	Moderation	251155.7122	322984.2215	362385.6466
14	Urban	Regular	689.7969225	427.4372025	2989.28376
15	Youth	Youth	3931.03074	2891.005425	5397.748965

On the right side, the 'Query Settings' pane is visible. The 'PROPERTIES' section shows the 'Name' property set to 'Budget\_Path'. The 'APPLIED STEPS' section shows the 'Source' step selected.

3. UpdateSource Applied Step to use ResolvedBudgetPath = "Budget\_Path" to the following Queries: • BudgetFact • BudgetFact\_Data

The screenshot shows the Power BI Desktop interface. On the left, the 'Queries [19]' pane lists various queries, with 'BudgetFact' selected and highlighted with an orange box. The main window displays a table with the following data:

Column1	Column2	Column3	Column4	Column5
Budget Spreadsheet for VanArsdel				
		Forecast	Forecast	Forecast
		2016	2016	2016
			Nov	Oct
Category	Segment	Dec		
Accessory	Accessory	44190.57888	50598.81566	54740.5709
Mix	All Season	11442.14474	14120.78693	18109.64804
Mix	Productivity	19538.89812	17597.55926	22835.18396
Rural	Select	311.708775	172.2601125	662.79129
Urban	Convenience	120710.4406	129923.2814	169468.7696
Urban	Extreme	20868.84072	46971.33037	70793.02886
Urban	Moderation	251155.7122	322984.2215	362385.6466
Urban	Regular	689.7969225	427.4372025	2989.28376
Youth	Youth	3931.03074	2891.005425	5397.748965

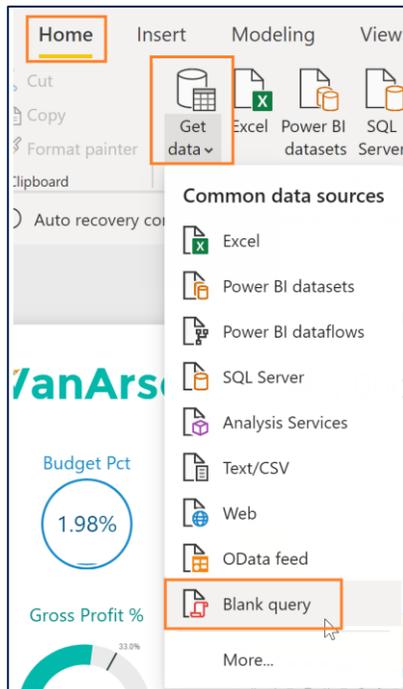
On the right, the 'Query Settings' pane is open, showing the 'APPLIED STEPS' section. The 'Source' step is highlighted with an orange box, indicating it is the current step being edited.

# Lab 4c: Create a custom function

**Task:** Create a custom function

**The estimated time to complete this lab is 15 minutes.**

1. Create a new blank query

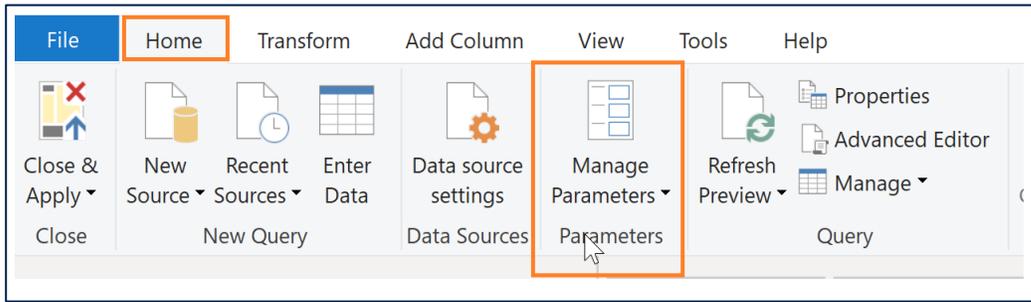


- a. Query Name: **"fn\_DaySinceYearStart"**
- b. In Advanced Editor copy in text from **Number\_Days.txt**

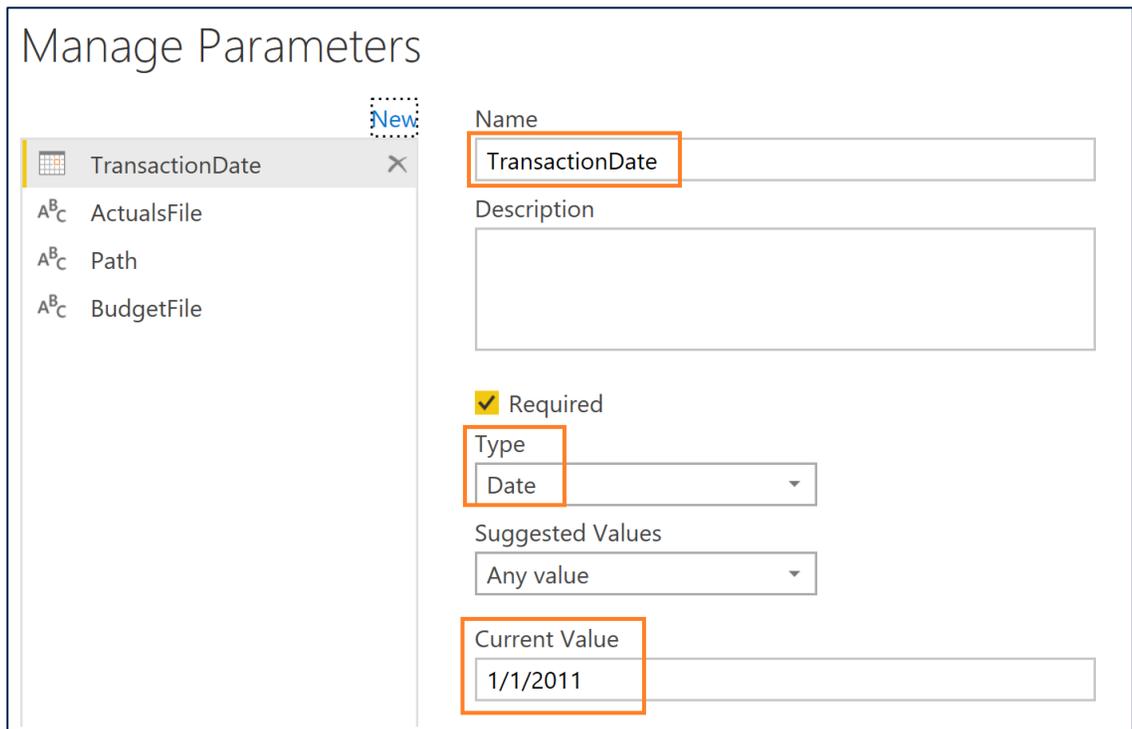
```
fn_DaySinceYearStart

let
    Source = (TransactionDate as date) => let
        YearStart = #date(Date.Year(TransactionDate),1,1),
        #"DateDiff" = Duration.From(TransactionDate-YearStart),
        #"NumberDays" = Duration.Days("#DateDiff")+1
    in
        #"NumberDays"
in
    Source
```

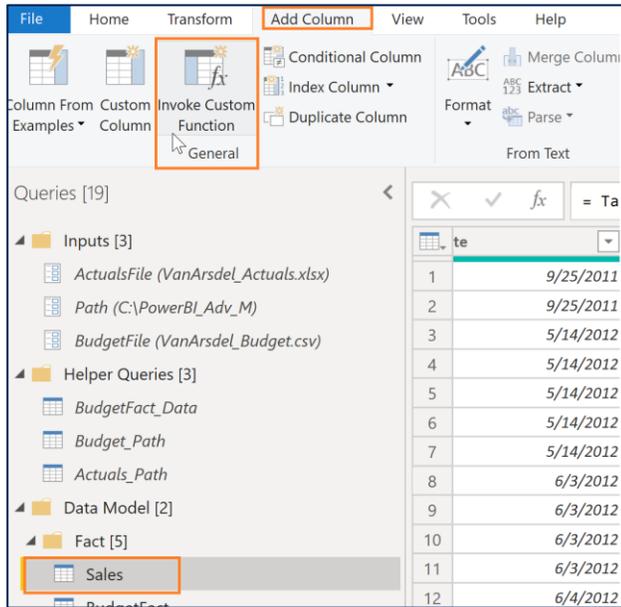
2. Create a new Parameter



- a. Parameter Name: **TransactionDate**
- b. Type: **Date**
- c. Current Value = **1/1/2011**



3. Update Sales query
  - a. **Add Column -> Invoke Custom Function**

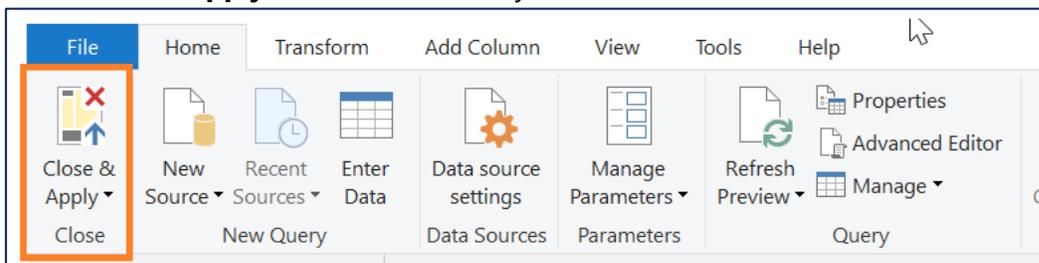


- b. New Column Name: **DaysFromYearStart**
- c. Function query: **fn\_DaySinceYearStart**
- d. Transaction Date = **Select current date from calendar**

fx = Table.AddColumn(#"Changed Type", "DaysFromYearStart", each fn\_DaySinceYearStart([Date]))

te	CustomerID	CampaignID	Units	DaysFromYearStart
1	9/25/2011	70283	22	268
2	9/25/2011	195385	22	268
3	5/14/2012	212645	22	135
4	5/14/2012	70666	22	135
5	5/14/2012	114459	22	135
6	5/14/2012	221670	22	135
7	5/14/2012	26974	22	135
8	6/3/2012	268392	22	155

4. Click **Close & Apply** to exit Power Query



5. Close and Save the pbi file.

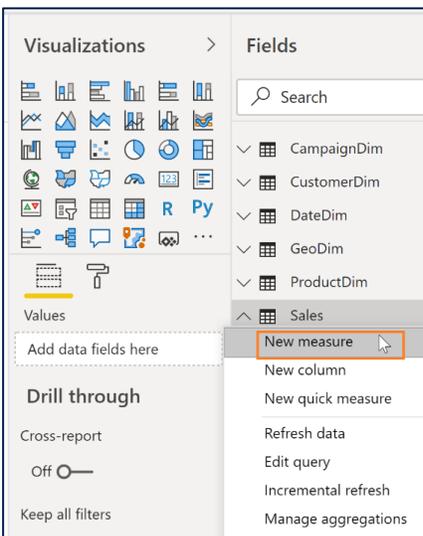
# Lab 5: Create new measures and columns

**Tasks:** You will create a new measure for Total Units Sold, a new calculated column that combines Product Category and Campaign Traffic together, and create visualizations to test the new measure and column

**Task 1.** Create **Total Units Sold** measure

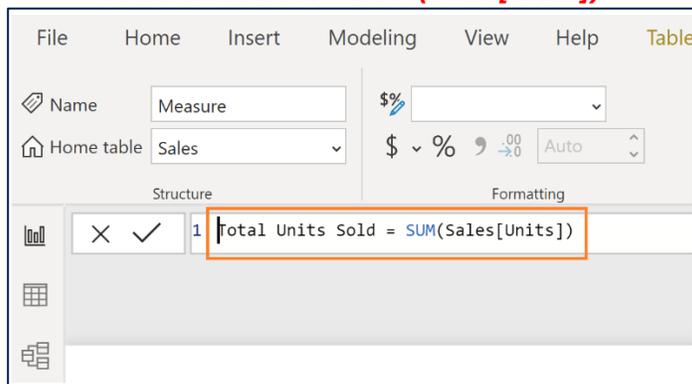
**The estimated time to complete this lab is 30 minutes.**

1. Select **Sales** Table. From the ribbon select **Modeling** -> **New Measure**

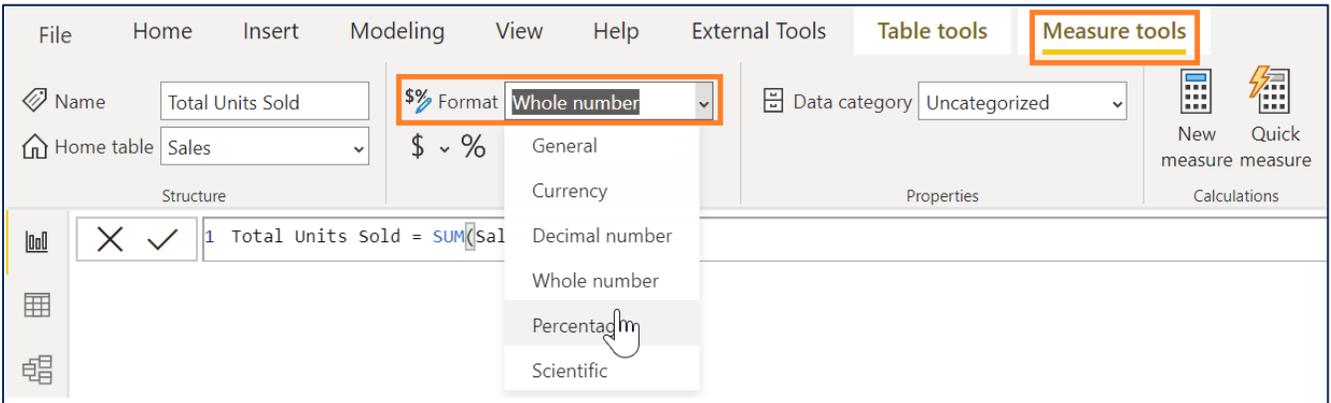


2. In the formula bar enter:

***Total Units Sold = SUM(Sales[Units])***

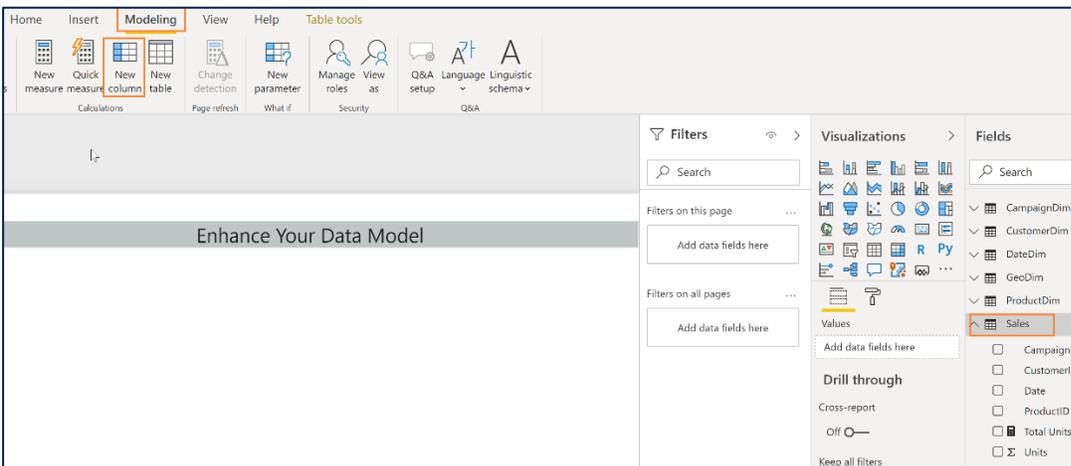


3. From the **Measure tools** ribbon select **Format** -> **Whole number** to format the measure



**Task 2:** Create calculated column that combines Category and TrafficChannel

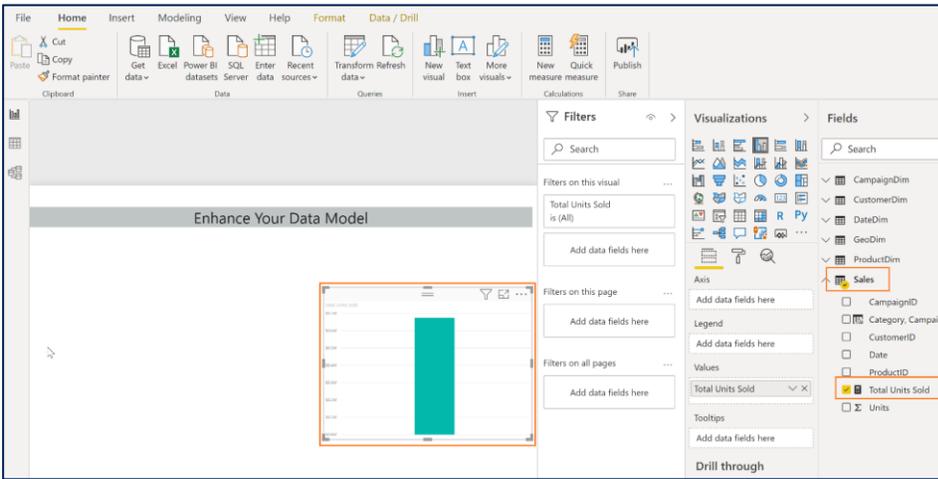
4. Select **Sales** table. From the ribbon select **Modeling** -> **New Column**.



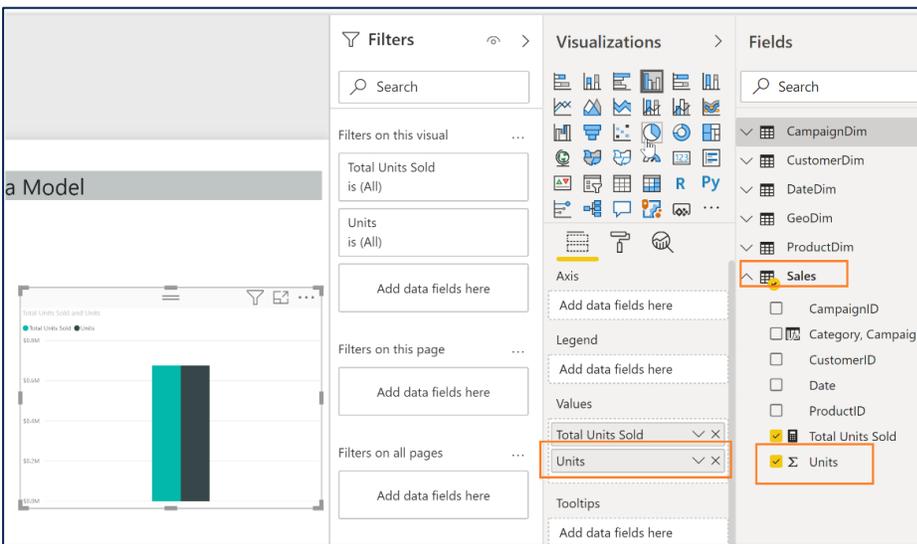
5. In the formula bar enter:

***Category, Campaign = RELATED(ProductDim[Category]) & ", " & RELATED(CampaignDim[TrafficChannel])***

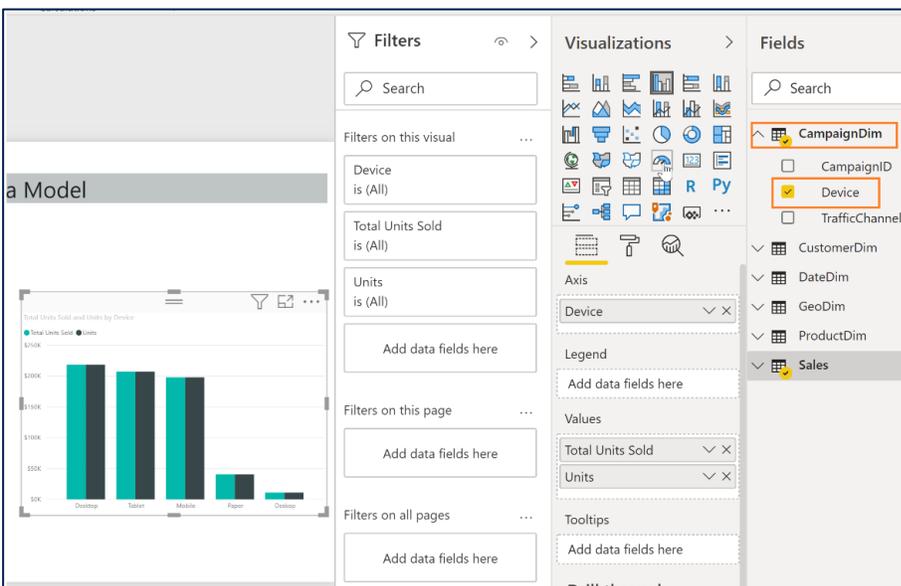
6. Drag newly created **Total Units Sold** measure to the canvas. A clustered column chart is created



7. Drag **Units** field from **Sales** table to this visual



8. Select **Device** field from **CampaignDim** table

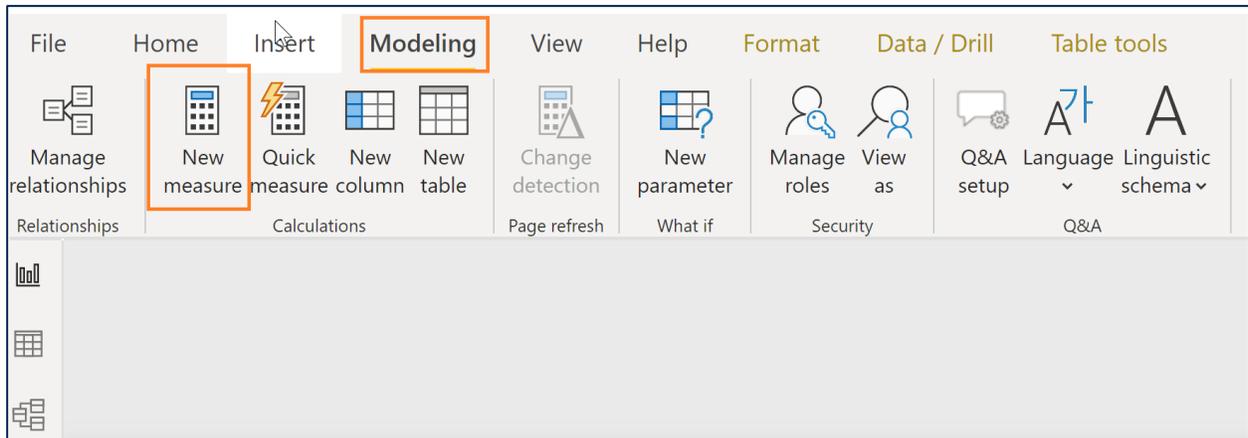


# Lab 6: Create a report for the VP in charge of the Youth and Accessory Segments

**Task 3:** Create three new measures and a PowerBI visualization

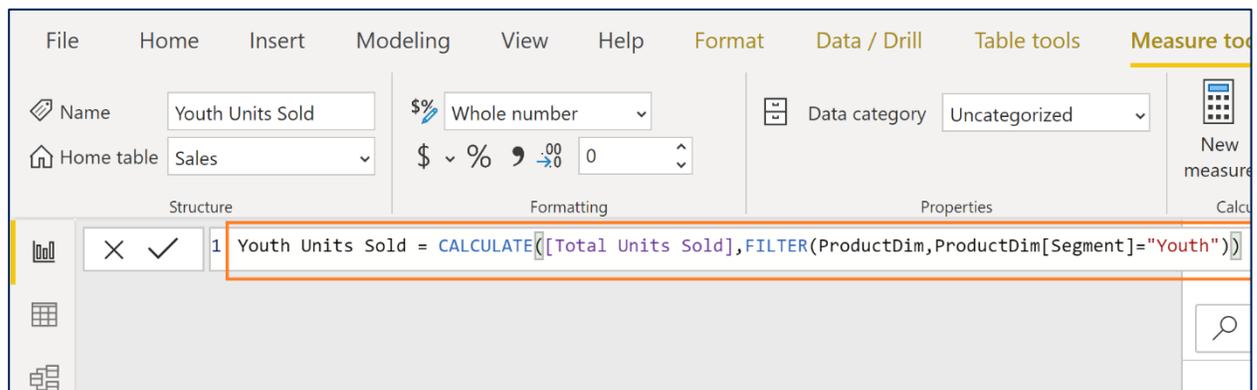
**The estimated time to complete this lab is 45 minutes.**

1. Select **Sales** Table. From the ribbon select **Modeling** -> **New Measure**.

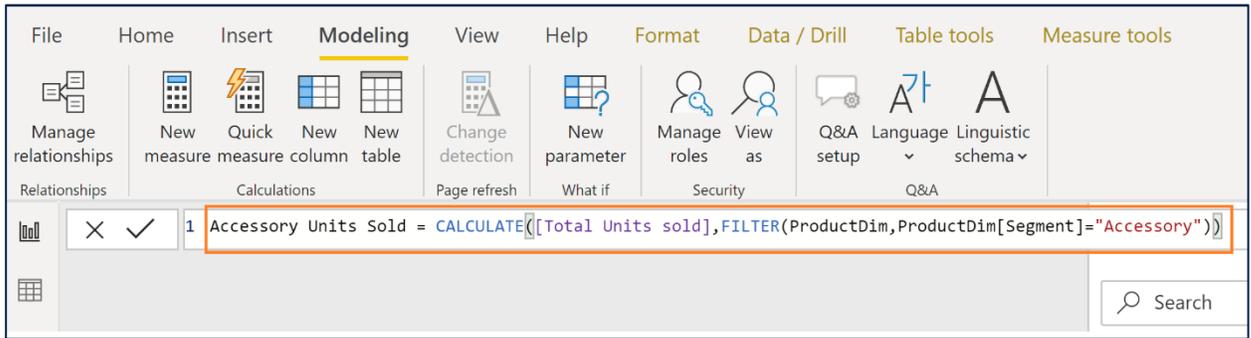


2. Create 3 measures:

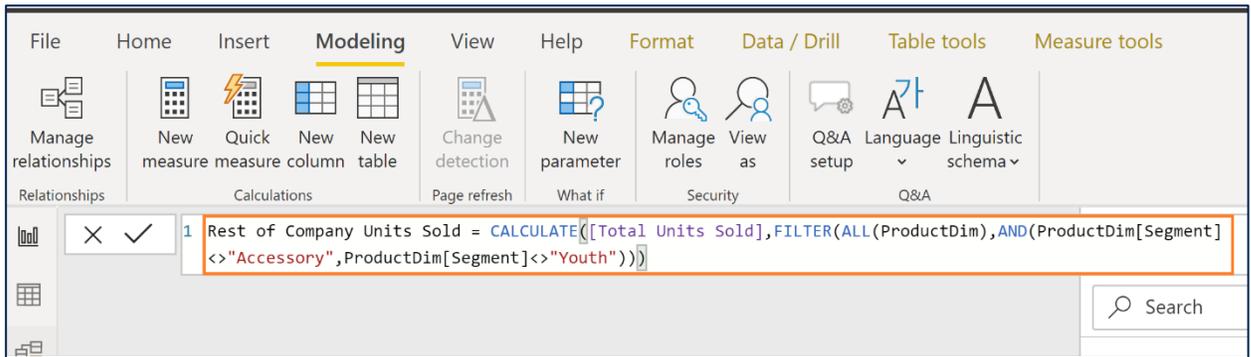
***Youth Units Sold = CALCULATE([Total Units Sold],FILTER(ProductDim,ProductDim[Segment]="Youth"))***



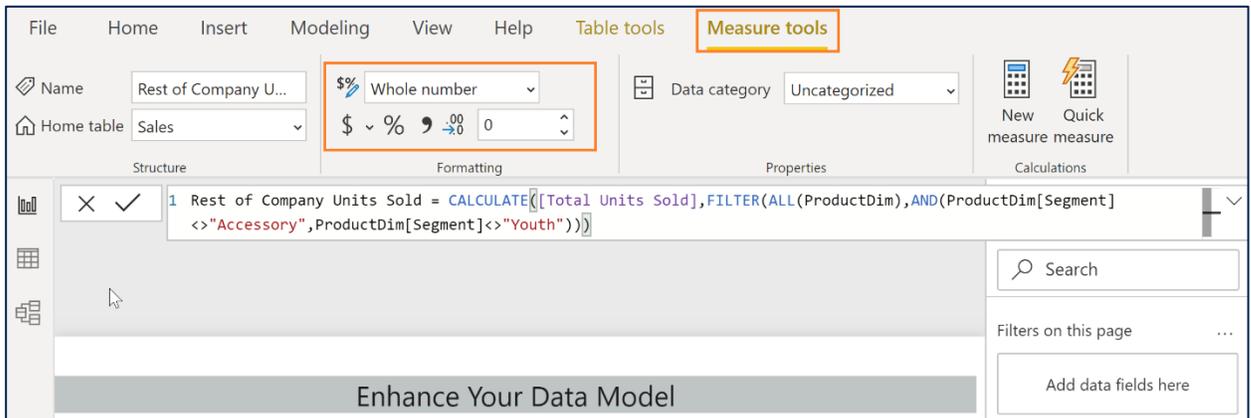
***Accessory Units Sold = CALCULATE([Total Units sold],FILTER(ProductDim,ProductDim[Segment]="Accessory"))***



**Rest of Company Units Sold = CALCULATE([Total Units Sold],FILTER(ALL(ProductDim),AND(ProductDim[Segment]<>"Accessory",ProductDim[Segment]<>"Youth")))**



- From the ribbon select **Measure tools -> Whole Number and Comma** to format the measure



- Add a table visual and drag **CampaignDim -> Device** and the **3 newly created measures**

The screenshot shows the Power BI Desktop interface. On the left, the 'Data Model' pane displays a table with the following data:

Device	Total Units Sold	Youth Units Sold	Rest of Company Units Sold
Desktop	610,352	223	951
Desktop	5218,480	4533	201338
Mobile	1192,014	4427	151767
Tablet	146,514	918	17462
Tablet	5207,344	5151	159855
<b>Total</b>	<b>9179,268</b>	<b>13641</b>	<b>422958</b>

The 'Visualizations' pane on the right shows the 'Fields' list with the following items selected (indicated by orange boxes):

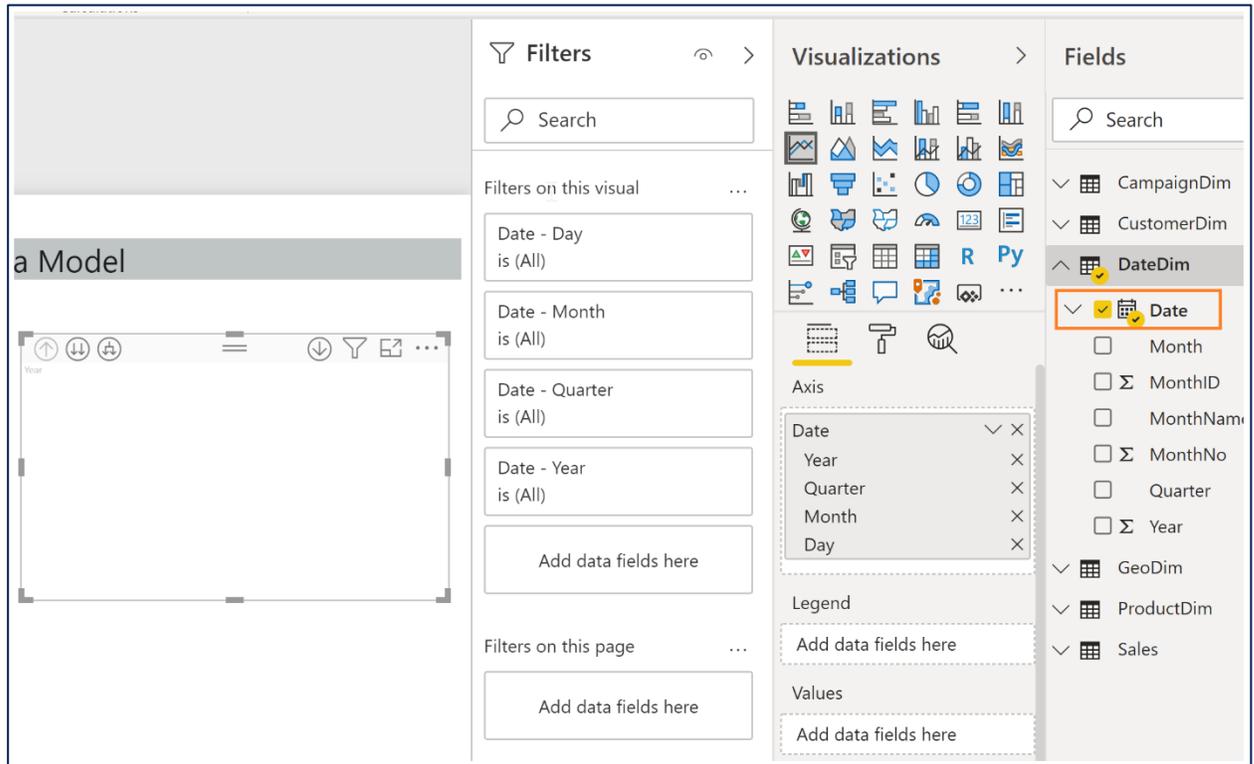
- Device
- Rest of Company Units Sold
- Total Units Sold
- Youth Units Sold

The 'Filters' pane shows filters for 'Device is (All)', 'Rest of Company Unit... is (All)', 'Total Units Sold is (All)', and 'Youth Units Sold is (All)'. The 'Visualizations' pane also shows 'Values' with 'Device', 'Total Units Sold', 'Youth Units Sold', and 'Rest of Company Units' selected.

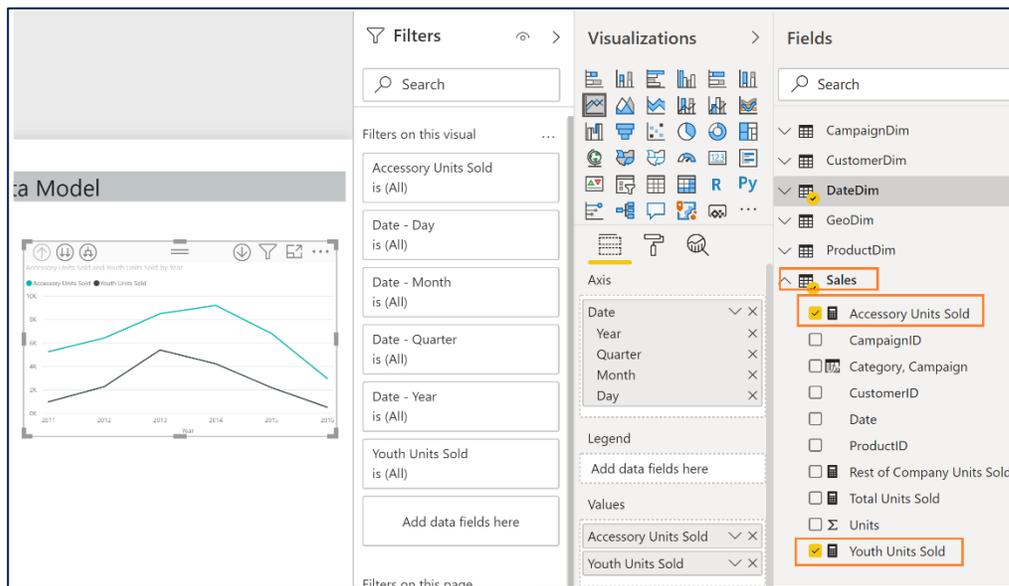
5. Select **Line Chart** visual.

The screenshot shows the Power BI Desktop interface with a line chart visualization. The 'Visualizations' pane on the right shows the 'Line Chart' icon selected (indicated by an orange box). The 'Fields' list is empty, and the 'Values' section has 'Add data fields here'.

6. Select **Date** from Date table

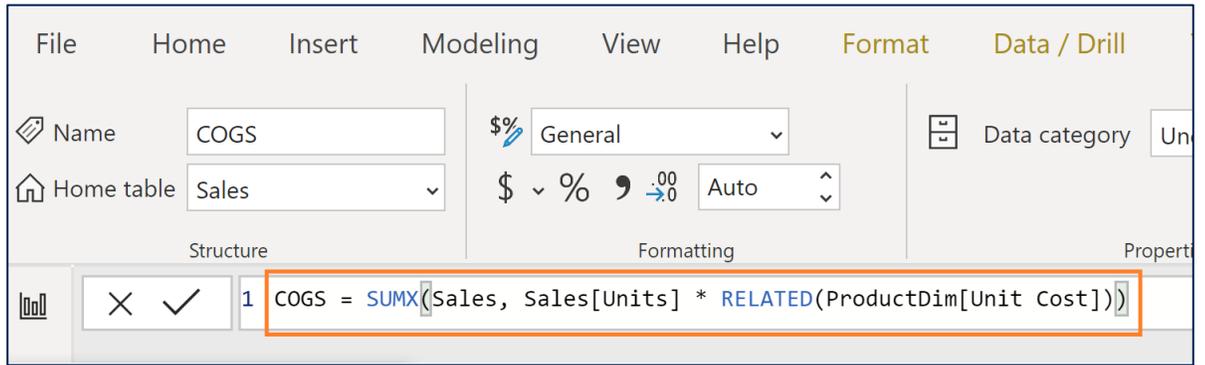


7. Select **Youth Units Sold** and **Accessory Units sold** measures.

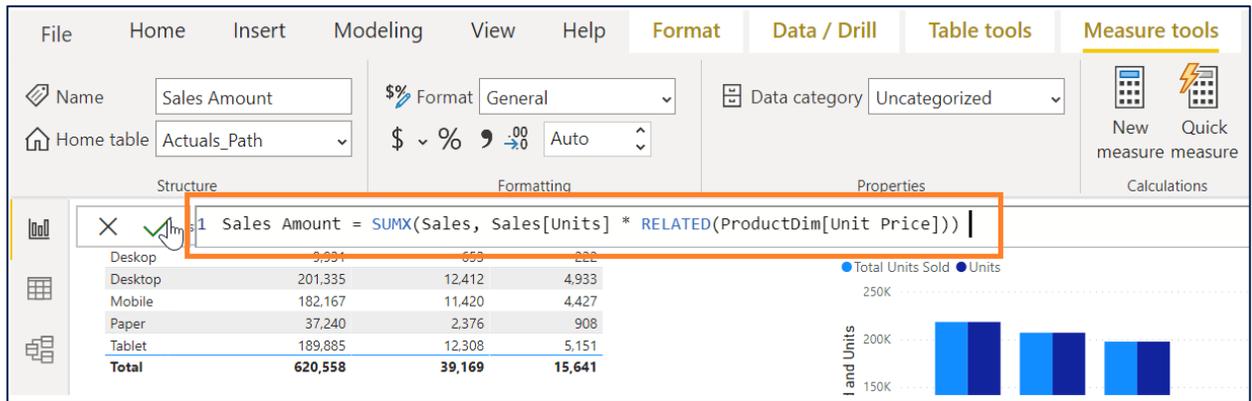


8. Create following measures and use a visual to analyze data.

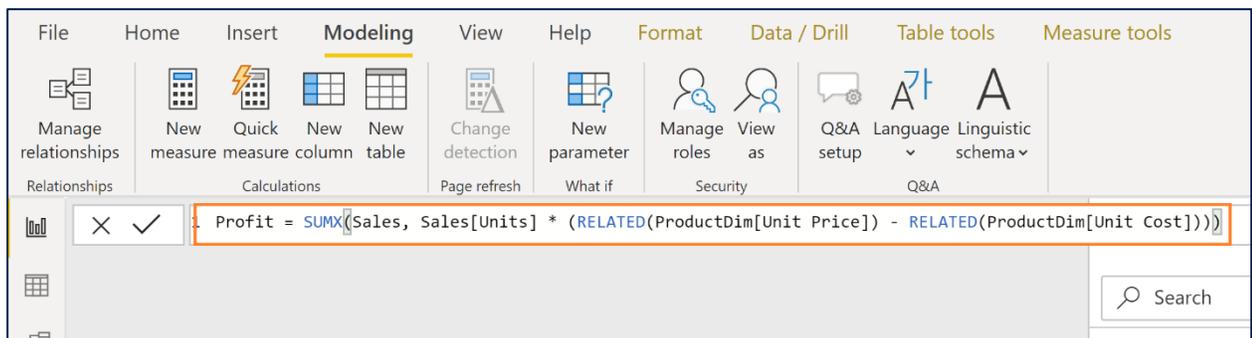
$$COGS = SUMX(Sales, Sales[Units]) * RELATED(ProductDim[Unit Cost])$$



***Sales Amount = SUMX(Sales, Sales[Units] \* RELATED(ProductDim[Unit Price]))***



***Profit = SUMX(Sales, Sales[Units] \* (RELATED(ProductDim[Unit Price]) - RELATED(ProductDim[Unit Cost])))***



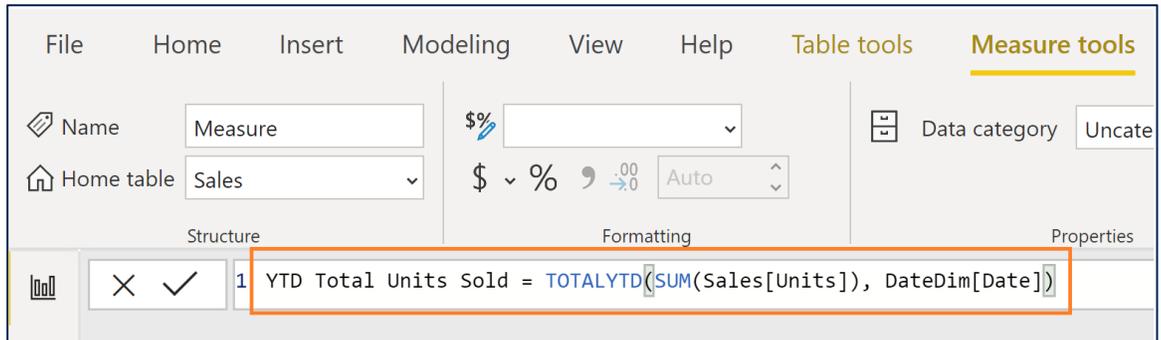
# Lab 7a: Performance Best Practices

**Task:** Analyze DAX formulas to ensure you're using the best practices

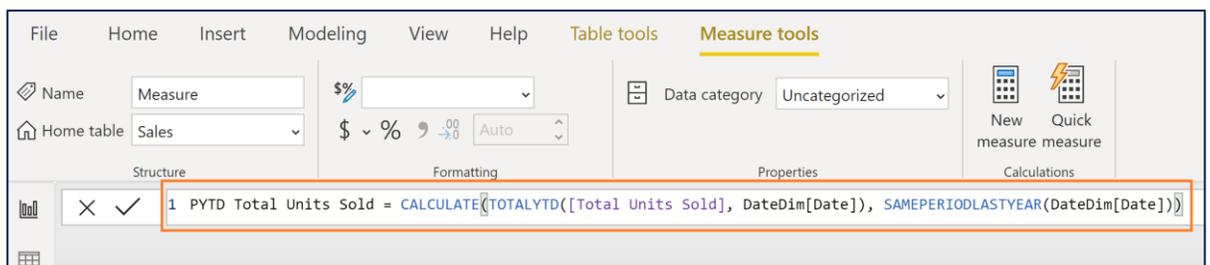
**The estimated time to complete this lab is 30 minutes.**

1. Create the three measures below.

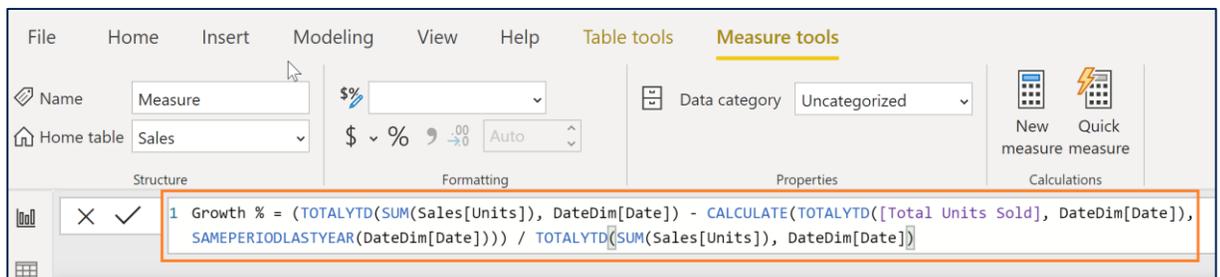
***YTD Total Units Sold = TOTALYTD(SUM(Sales[Units]), DateDim[Date])***



***PYTD Total Units Sold = CALCULATE(TOTALYTD([Total Units Sold], DateDim[Date]), SAMEPERIODLASTYEAR(DateDim[Date]))***



***Growth % = (TOTALYTD(SUM(Sales[Units]), DateDim[Date]) - CALCULATE(TOTALYTD([Total Units Sold], DateDim[Date]), SAMEPERIODLASTYEAR(DateDim[Date]))) / TOTALYTD(SUM(Sales[Units]), DateDim[Date])***



2. Rewrite the DAX formulas to ensure performance best practices

***YTD Total Units Sold = TOTALYTD([Total Units Sold], DateDim[Date])***

**PYTD Total Units Sold = CALCULATE([YTD Total Units Sold],  
SAMEPERIODLASTYEAR(DateDim[Date]))**

**Growth % = ([YTD Total Units Sold] – [PYTD Total Units Sold]) / [PYTD Total Units Sold]**

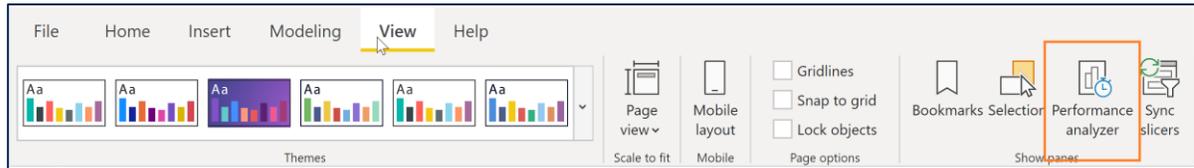
3. **Challenge:** how were the formulas changed to increase performance?

# Lab 7b: Using Performance Analyzer

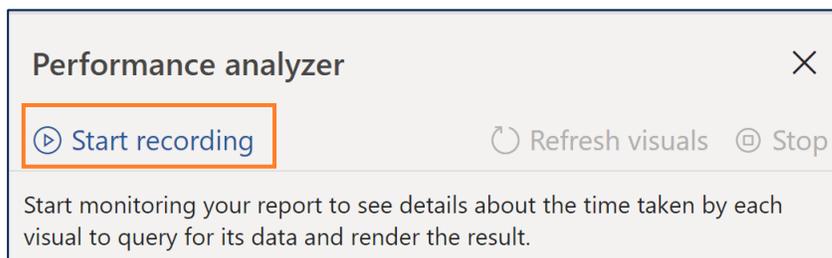
**Task:** Use performance analyzer to test the performance of individual charts

**The estimated time to complete this lab is 15 minutes.**

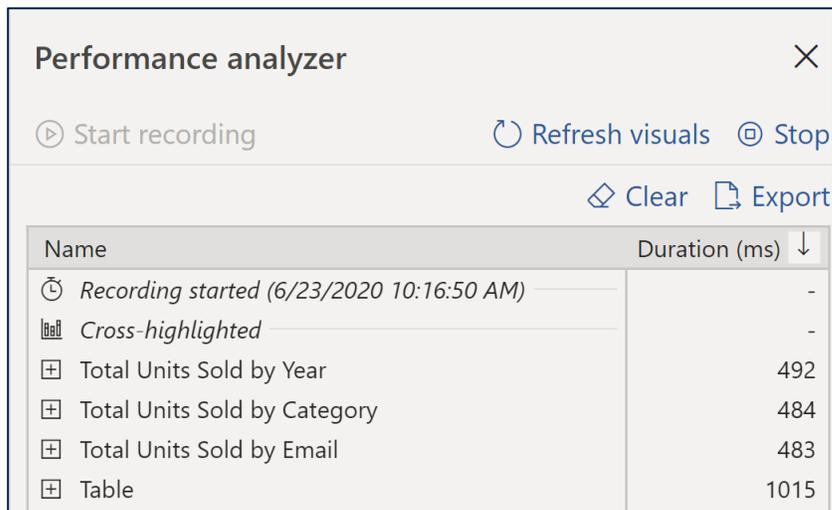
1. Click on the View tab and open the Performance Analyzer



2. Start recording and click on Refresh visuals



3. Analyze the data collected



4. **Challenge:** What changes can you make to improve performance?

# Summary

In this lab, you uploaded multiple tables from a single data source. You learned how to create a brand new dimension for the model as well as enhance existing dimensions. You will have created a new budget fact table for the model. In the end you will have created new parameters and dynamic paths to your data sources.

In this lab, you have also enhanced the model by adding additional measures and columns. In the end you will have tested the new measures and columns using Power BI data visualizations as well as worked with best practices and analyzed report performance.

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