

MICROSOFT POWER BI LEVEL 2 TRAINING MANUAL



Magic Rabbit Hat Software Training

Power BI 2

The Query Editor

The Query Editor allows users to connect to data sources, manage data sources, transform data and even add custom columns enhance your queries.

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To access the Query Editor, select the Edit Queries command from the Home Ribbon.

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Data Source Settings

- To view or change the data source for your report, select Data source settings from the Editors Home tab.
- To change the data source, select change source.
- The name, file path and delimiter type are available. Select the browse button to search for the new data source.



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Applied Steps / Undo Actions



Each action that is applied to the query is represented in the Query Settings pane. To undo any action in the editor select the "X" next to that action.

Click the name of the action to view the data as it was prior to applying that action.

Skipping backwards to delete a step may result in query errors.



Merging Queries

In addition to the Editors many tools, you can also merge separate data sources into one query result.

Joined Queries

Using a <u>common</u> field, tables can be joined to create one table with additional column of information.

- To create the joined/ merged query first select the initial table for the merge.
- Next, select Merge Queries from the Home tab and choose Merge as New Query
- The merge query dialog box will appear, and you will need to add the second table to be joined.
- Click or select the common field from each table to be joined
- Select the Join type (See the options to the right)
- Click OK and the new merged table will appear in the queries pane on the left.

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622	Renaud	Tofpik	rtofpikh9@gov.uk		5/18/2019	Toys	
387 Giacinta		Maltster	gmaltsteraq@com	senz.com	12/22/2018	Toys	
379	Nickolaus	Champley	nchampleyai@net	worksolutions.com	3/12/2019	Health	
204	Morgan	Chalfant	mchalfant5n@yola	isite.com	1/15/2019	Automotive	
178	Mitzi	Aiken	maiken4x@yolasit	e.com	8/21/2019	Computers	
<							>
Grocery Baby Books		Rudolfo Chiswell Barb Mibourne Nolly Nockalls	427 230 130				
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Append Query

Tables with <u>matching</u> fields can be appended to create larger datasets.

(i.e. separate datasets from multiple years with a similar layout)

- From the home tab select Append Queries and then Append queries as new
- From the dialog box select the number of tables to be joined (2 for this example)
- Next, select the Primary table to be appended to
- Select the table to be appended
- Click Ok and the new combined dataset will be available in the query Pane on the left of the editor.

Creating Tables By entering data

Additional information that is not already in the data source can be added to your queries by creating a table and entering the data manually.

These tables can then be joined to existing data to enhance results

- From the Home tab, select Enter Data
- Enter your first value into Column 1 The column names can be changed by double clicking
- Additional records are added by clicking the Asterisk (*) in the next row. Additional columns may be added by clicking the Asterisk (*) to the right



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.re	eate Tabl	e				
	Region No.	Region Descript	*			
1	1	Sales Region 1				
2	2	Sales Region 2				
3	3	Sales Region 3				
4	4	Sales Region 4				
*						
	n Designed Tel					
am	e: Regional Tab	ble				
				Load	Edit	Cancel

Using Data Entry Tables

The new table can be used to create relatable fields between tables





The table may also be used to enhance visualizations

Transforming Data

The BI Query Editor provides the users with several tools to convert or "Wrangle" data. This allows users to transform difficult datasets into data formats that work easily in reports.

Transpose

If data is positioned horizontally, it can be rotated using the Transpose tool in the editor

To convert data from horizontal to vertical layout

- Select any one cell of your data in the query editor
- From the Transform ribbon choose Transpose.
- The data is converted to a vertical format

*At the end of the process, select Use first row as header (from the Transform tab) to promote the first row of the "flipped" data to headers.

	123 Column1	 ABC 123 Column2 	 ABC 123 Column3 	ABC 123 Column4
1		1	2	3
2	Marybelle	Xymenes	Lorettalorna	Aurie
3	Geddes	Faragher	Sancho	Gilkes
4	mgeddes0@state.gov	xfaragher1@desdev.cn	Isancho2@diigo.com	agilkes3@ftc.gov
5	10/14/2019	9/28/2019	11/6/2019	10/14/2019
6	Grocery	Baby	Books	Sports
7	\$111.26	\$38.24	\$119.00	\$66.36
8	Buffalo	Atlanta	Newport News	Lansing
9	New York	Georgia	Virginia	Michigan
10	14210	31165	23605	48919
11	1	4	1	4

Conditional Columns

Power BI allows users to create custom columns that are populated conditionally as a result of values in other columns. These conditional columns provide the flexibility of a custom result and may also be used in reports to add a different perspective to the visualizations.

To create a Conditional Column

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voke Custom Function	탄출 Conditiona 헮i Index Colur 다음 Duplicate C	l Column nn - olumn
General		

Add	Conditiona	l Column			
Add a d	conditional column ti	hat is computed from the o	other columns or values.		
New co	lumn name				
Custor	m				
	Column Name	Operator	Value ①	Output ()	
If	State	* equals	123 - CA	Then 123 * Local Customer	
Add ru Else () 115 -	le	equals does not equal begins with does not begin with ends with does not end with contains does not contain		-	OK Cancel

- From the Add Column ribbon of the Query Editor select Conditional Column
- Add a name for the new column
- Add the criteria for your column
 - o Column Name
 - Operator (see diagram for options)
 - o Value to examine
- Add the output entry for the conditional column
- You may add an else to the condition or leave it blank. Records that do not meet the criteria requirements will have a blank in that column.
- Click OK and the column is created and place at the far right of the table

Keep and Remove Rows

Specific data rows can be isolated without the need for a query and criteria by using the keep or remove rows feature.



This feature can be used to:

- keep or remove duplicate records
- keep or remove rows from the top or bottom of the dataset
- keep or remove a range of records (ie. 15 thru 50).
- You can even remove blanks or rows with errors



Grouping Records

Records may be grouped and summarized using the Group By command on the Transformed tab.

To group and summarize records

- Select the Group By command from the Transform ribbon
- Choose the field to group by
- Add the calculation to be applied (the list of options is on the right)
- Choose the field that the calculation is to be applied to

Add additional grouping levels

Add additional Aggregations



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Group by						
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City						
Add provision						
Add grouping						
Add grouping New column name		Operation		Column		
Add grouping New column name Total by City and State		Operation Sum	Ŧ	Column Purchase Amount	•	
Add grouping New column name Total by City and State Count of Customer by State		Operation Sum Count Rows	¥ T	Column Purchase Amount	Ŧ	
Add grouping New column name Total by City and State Count of Customer by State		Operation Sum Count Rows	* *	Column Purchase Amount	Ŧ	
Add grouping New column name Total by City and State Count of Customer by State Add aggregation		Operation Sum Count Rows	* *	Column Purchase Amount	Ÿ	

Single level grouping of records

Select the Advanced option to:

•

•

Queries [1] <		A ^B _C State	1.2 Total Amount by State
Customer List This Year	1	New York	5142.5
	2	Georgia	3315.9
	3	Virginia	4631.82
	-4	Michigan	2360.58
	5	Mississippi	304.36
	6	Florida	9603.24
	7	Montana	354.48
	8	Texas	12535.9
	9	California	12062.42
	10	New Mexico	1248.58
	11	Indiana	2060.44
	12	Alabama	2436.42
	13	Alaska	502.62
	14	Arizona	1370.2
	15	Ohio	3388.22
	16	Illinois	2165.64

Multi-level grouping

Queries [1] <		A ⁸ _C State	A ^B _C City	1.2 Total by City and State	1.2 Count of Customer by State	
Customer List This Year	1	New York	Buffalo	316.1		4
	2	Georgia	Atlanta	1320.52		13
	3	Virginia	Newport News	175.88		2
	4	Michigan	Lansing	405.7		- 4
	5	Mississippi	Jackson	270.6		3
	6	Florida	Orlando	1399.44		10
	7	Montana	Billings	354.48		3
	8	Texas	Dallas	1097.22		11
	9	California	Riverside	236.48		2
	10	Texas	San Antonio	1127.54		10
	11	New Mexico	Albuquerque	768.48		7
	12	Indiana	Indianapolis	600.74		8
	13	New York	White Plains	216.35		2
	14	New York	Rochester	671.34		5
	15	Texas	El Paso	2347.38		20
	16	Florida	Tallahassee	426.36		3
	17	Alabama	Montgomery	379.18		4
	18	Indiana	Muncle	106.76		1
	19	Texas	Houston	2826.68		20
	20	Alaska	Anchorage	502.62		3
	21	Arizona	Phoenix	815.36		7
	22	California	Los Angeles	663.24		10
	23	Ohio	Cincinnati	1071.65		11
	24	Illinois	Peoria	337.22		3

Editing Visualizations

Working with Themes

Themes in Power BI are a great way to standardize formatting of reports without manually formatting each visualization separately. There are a variety of themes to choose from and users can even create new themes. To view a selection of idea generating themes, visit the theme gallery near the bottom of the themes list.

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Selecting a theme

To apply a theme to your report just select Switch theme from the right side of the home tab. All visualization backgrounds, data points, borders, etc. will change to the selected theme colors.



Create and Import a theme

Themes can be imported into Power BI as JSON files (.json)

{

"name": "St Patrick's Day",

"dataColors": ["#568410", "#3A6108", "#70A322", "#915203", "#D79A12", "#bb7711", "#114400", "#aacc66"],

"background":"#FFFFFF",

"foreground": "#3A6108",

"tableAccent": "#568410"

}

The sample above demonstrates important elements that determine the structure of the theme

- "name" of the theme
- "dataColor"
- "background"
- "foreground"
- "tableAccent"

To apply the theme:

- Select Switch Theme from the Home tab
- Select Import theme
- Find and select the ".json" theme file
- All visualizations in the report will adopt the new theme.

Color choices are entered in a hexadecimal format

For more information on themes select "How to create a theme"

or visit the Microsoft Power BI Theme gallery at the bottom of the Themes list.

Creating New Measures

Although most measures are created naturally in Power BI, you may want to add additional measures to provide specific summarization to your reports. Power BI provide 2 types, Measures and Quick Measures. Let's look at methods for creating both.

To create a new Measure:

- Select New Measure from the Home tab
- A small calculator will appear in the fields pane
- The formula bar will open at the top of the screen
- Create your measure using the DAX formula language
- You can rename the new measure by right clicking the measure in the Fields pane
- Add your new measure to your report as needed

Home Vi Cut Copy Format Painter	ew Modeling He Get Recent Enter Data Sources Data	Edit Queries +	New New Ask A Page Visual Question	Buttons C SI
Format Painter Clipboard X V 1 Me	Data - Sources - Data	Queries▼	Page - Visual Question	ب طبع
	External di	ata	Inse	nt
	asure = AVERAGE ('Custor	mer List This Year	r With Code'[Purchase	Amount])



Create Quick Measures

Quick Measures can create calculable fields for use in reports without the need to write DAX expressions.

To create a new Quick Measure

- Select New Quick Measure from the Home tab.
- Select the type of calculation for your measure

Calculation	Fields
Year-to-date total	O Search
Calculate the total of the base value, starting from th beginning of the current year. Learn more	e Customer List This Year With Code
Bare value ()	Category_Purchased
built voide G	City
Sum of Purchase Amount	× Σ customer_No
Date @	email
vate o	first_name
Purchase_Date	× last_name
	List of last_name values
	E Purchase Amount Amo
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	2 😫 Date Hierarchy
	E Year
	C Quarter
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The measure can now be used in the report to provide a "running total" calculation providing a view of the data that did not previously exist.

Create Hierarchies

While hierarchies are naturally created in Power Bi for date fields (one example), users can create hierarchies for other fields as needed. In this example, we will create our own hierarchy for the state field.

To create a hierarchy:

 In the Fields pane, right click the State field that you would like to add the hierarchy to and choose New hierarchy Purchase_Date
 Σ Region Code
 State
 State Hierarchy
 State
 Σ Zip

• Select the field to add to the State hierarchy (City) and choose Add to hierarchy



- Repeat the process and add the Zip field to the hierarchy
- You may now use the hierarchy in your report allowing users to drill down from the state level

	State
^ □ ≌	State Hierarchy
	State
	City
_ Σ	Zip

Filters

Power BI users have a variety of tools to focus the analysis of values in the dataset. These filters include: Top N Filters, Parameters and Drillthrough.

Top N Filters

Top or bottom values can be identified in visualizations by selecting the visualization and then using the Filter Pane on the right side of the program. The filter is applied by selecting the filter for the category / dimension.

The default filter is Basic filtering.

- Select the drop down and choose Top N filter
- Select a top or bottom target (i.e. Top or bottom 3)
- Add the value field to use as a filter
- Click Apply filter to activate.
- The filter pane will change color (grey) when the filter is applied.
- To clear the filter, click the small eraser at the top of the filter.

Category_Purchased is (All)
Filter type 🛈
Top N 🔹
Show items:
Тор 🔻 3
By value
Purchase Amount \lor ×
Apply filter

Filters on this visual	
Category_Purchased	a
top 3 by Purchase A 🖉	0
Filter type 🛈	
Top N	•

Parameters

Parameters may be added to most visualizations. These prebuilt criteria packages allow users to get a head start on query criteria instead of, or in addition to adding filters on the fly.

To create a Parameter

- Select New Parameter from the Home tab of the Query editor
- Add a name for your criteria in the first field and a description if necessary
- Change Parameter type
 - Types include numerical, text, date, etc. or leave the default ANY type to provide the most flexibility to your users
- In the suggested values field, you may use query results, a typed list of values or you may leave ANY
- Select a default value to start the parameter with
- Add a current value to use as an initial filter.

	New	Name	
A ^B C State Parameter	×	State Parameter	
		Description	
		✓ Required	
		Туре	
		Text *	
		Suggested Values	
		List of values *	
		1 California	
		2 Texas	
		3 New York	
		4 Colorado	
		-	
		Default Value	
		California	
		Current Value	
		California	

To use the parameter

In the below example, we will use a Parameter to change the results of a conditional column.

Create the conditional column

- In the query editor select Conditional column from the Add column tab
- When the dialog box opens, type a name for your new

ldd a	conditional column t	hat is computed from	the other columns or values.		
Targe	t State				
	Column Name	Operator	Value ()	Output ()	
If	State	* equals	* ALC *	Then 123 * Target State	
Add n	ule		ABC 123 Enter a value Select a column Parameter		
se () ac 23 *					

column into the New column name field

- Next, select the column on which to add the condition
- In the value field select parameter from the provided list
- Then choose your newly created parameter
- Add an output to show when the item is found in the column and click OK.
- Your output phrase will show in the column next to each record that meets your filter criteria
- To change the criteria, select the parameter in the panel on the left of the screen and change the current selection field.
- Return to your query and view your results

Texas	null	78230
New Mexico	null	87201
Indiana	null	46226
New York	Target State	10606
New Mexico	null	87105
Texas	null	75358
New York	Target State	14646
Texas	null	88525
Florida	null	32314
Alabama	null	36195
testine.		47300

User Interaction Buttons

User interaction buttons allow anyone viewing the visualization to navigate the visualization with a button click. Some options for the buttons include:

- Reset
- Move left or right
- Request information
- Ask a question of the data in the report

In the example below, we will add the "Ask a question button".

To add user interaction buttons to a report

- Select Buttons from middle the Home tab
- Choose the Q&A button.
 The button will appear

: A tion	Buttons	Image
Inse	t	

i) Ask a question of your report

in the top left corner of the report

- Drag the button to a location of your choosing and make sure that the button selected
- Click the Button text in the in the Visualizations tab and then Button Text
- Type any text that you would like to see on your button.

To use the button, <u>control click</u>, and the Q&A window will appear with sample questions and you will can use the natural language query feature to find insight into your data.

uestions to get you started	C Ask a question about your data	
werage customer no	Ask a related question Clear	Add this question
ount target states		
umber of target states		
ow many category purchased are there		
ompare purchase amount and region code		
ow many customer list this year with code re there		
ort customer list this year with code by irget state		
verage purchase amount for each region ode		
umber of customer list this year with code y region code		
umber of customer list this year with code or each target state		