



# DAX in Power BI



# MEET DAX

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Data Analysis Expressions (DAX) is a set of functions and operators that are combined to create formulas and expressions in Power BI Desktop, Azure Analysis Services, SQL Server Analysis Services, and Power Pivot in Excel data models.

DAX formulas include functions, operators, and values to perform advanced calculations and queries on data in related tables and columns in tabular data models.



# Dax allows you to :

**Calculated Column:**  
This adds a new Column to the data and does a row level calculation

**Calculated Measure :**  
This is visible at the Report view only and does the calculation for the entire column

**Quick Measures :**  
These are pre written Calculations in Power BI

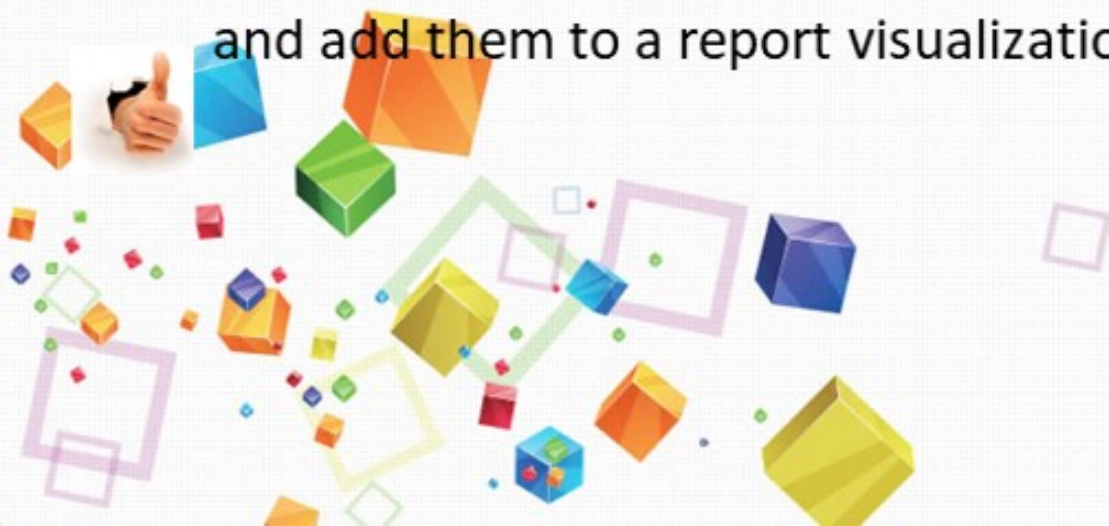




# Calculated Column

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- These are new formula based columns which can be added into the tables.
- When a calculated column contains a valid DAX formula, values are calculated for each row as soon as the formula is entered.
- Values are then stored in the in-memory data model.
- Calculated columns you create appear in the **Fields** list just like any other field, but they'll have a special icon showing its values are the result of a formula. You can name your columns whatever you want, and add them to a report visualization just like other fields.





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1 Quantity Type = IF(Orders[Quantity] > 1, "Multiple Item", "Single Item")

Region	Product ID	Category	Sub-Category	Product Name	Sales	Quantity	Discount	Profit	Quantity Type
West	OFF-ST-10003479	Office Supplies	Storage	Eldon Base for stackable storage shelf, platinum	77.88	2	0	3.893999999999999	Multiple Item
West	OFF-AR-10003811	Office Supplies	Art	Newell 327	6.63	3	0	1.7901	Multiple Item
West	OFF-AR-10001246	Office Supplies	Art	Newell 317	5.88	2	0	1.705	Multiple Item
West	OFF-AR-10000823	Office Supplies	Art	Newell 307	5.46	3	0	1.5218	Multiple Item
West	OFF-AR-10004456	Office Supplies	Art	Panasonic KP-4ABK Battery-Operated Pencil Sharpener	73.2	5	0	21.228	Multiple Item
West	OFF-PA-10002377	Office Supplies	Paper	Adams Telephone Message Book W/Dividers/Space For Phone Nur	22.72	4	0	10.124	Multiple Item
West	OFF-PA-10002005	Office Supplies	Paper	Xerox 225	45.36	7	0	21.7728	Multiple Item
West	OFF-FA-10002975	Office Supplies	Fasteners	Staples	11.34	3	0	5.2164	Multiple Item
West	OFF-ST-10003996	Office Supplies	Storage	Letter/Legal File Tote with Clear Snap-On Lid, Black Granite	80.3	5	0	20.878	Multiple Item
West	OFF-PA-10000477	Office Supplies	Paper	Xerox 1952	64.74	13	0	30.4278	Multiple Item
West	OFF-ST-10001963	Office Supplies	Storage	Tennsco Regal Shelving Units	405.64	4	0	12.692	Multiple Item
West	OFF-AR-10001419	Office Supplies	Art	Newell 325	12.39	3	0	3.717	Multiple Item
West	OFF-AP-10000692	Office Supplies	Appliances	Fellowes Mighty 8 Compact Surge Protector	60.81	3	0	17.0268	Multiple Item
West	OFF-PA-10001457	Office Supplies	Paper	White GlueTop Scratch Pads	90.24	6	0	41.1104	Multiple Item
West	OFF-ST-10000675	Office Supplies	Storage	File Shuttle II and Handi-File, Black	305.01	9	0	76.2525	Multiple Item
West	OFF-AR-10002375	Office Supplies	Art	Newell 351	13.12	4	0	3.8148	Multiple Item
West	OFF-AR-10000657	Office Supplies	Art	Binney & Smith inkTank Desk Highlighter, Chisel Tip, Yellow, 12/Bo	10.75	5	0	3.5175	Multiple Item
West	OFF-FA-10000134	Office Supplies	Fasteners	Advantus Push Pins, Aluminum Head	11.62	2	0	3.6012	Multiple Item
West	OFF-PA-10000552	Office Supplies	Paper	Xerox 200	12.96	2	0	6.2208	Multiple Item
West	OFF-FA-10001135	Office Supplies	Fasteners	Brites Rubber Bands, 1 1/2 oz. Box	3.96	2	0	0.07920000000000001	Multiple Item
West	OFF-AR-10003602	Office Supplies	Art	Quartet Omega Colored Chalk, 12/Pack	11.68	2	0	5.4896	Multiple Item
West	OFF-SU-10004782	Office Supplies	Supplies	Elite 5" Scissors	16.9	2	0	5.07	Multiple Item
West	OFF-SU-10002301	Office Supplies	Supplies	Serrated Blade or Curved Handle Hand Letter Openers	6.28	2	0	0.06280000000000002	Multiple Item
West	OFF-SU-10000616	Office Supplies	Supplies	Premier Automatic Letter Opener	180.74	2	0	14.1222	Multiple Item



# Measures

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- Measures are evaluated based on **filter context**, which means they recalculate when the fields or filters around them change (*like when new row or column labels are pulled into a matrix or when new filters are applied to a report.*)
- Measures are used in reporting that support combining and filtering model data by using multiple attributes such as a Power BI report or Excel PivotTable or PivotChart.
- Measures are created by using the DAX formula bar in the model designer.



File Home Insert Modeling View Help Table tools **Measure tools**

Name  \$%  Data category

Home table  \$ % 0

Structure Formatting Properties Calculations

1 Total Transactions = COUNT('Fact\_Sales 2015-17'[OrderQuantity])

Filters





# Quick Comparison between Calculated Column & Measures

## Calculated Column

- Values are calculated based on information from each row of a table (has row context)
- Appends static values to each row in a table and stores them in the model (*which increases file size*)
- Recalculate on data source refresh or when changes are made to component columns
- Primarily used as rows, columns, slicers or filters

## Measures

- Values are calculated based on information from any filters in the report (has filter context)
- Does not create new data in the tables themselves (*doesn't increase file size*)
- Recalculate in response to any change to filters within the report
- Almost *always* used within the values field of a visual





# DAX Operators

Arithmetic Operator	Meaning	Example
+	Addition	2 + 7
-	Subtraction	5 - 3
*	Multiplication	2 * 6
/	Division	4 / 2
^	Exponent	2 ^ 5

Comparison Operator	Meaning	Example
=	Equal to	[City]="Boston"
>	Greater than	[Quantity]>10
<	Less than	[Quantity]<10
>=	Greater than or equal to	[Unit_Price]>=2.5
<=	Less than or equal to	[Unit_Price]<=2.5
<>	Not equal to	[Country]<>"Mexico"

Text/Logical Operator	Meaning	Example
&	Concatenates two values to produce one text string	[City] & " " & [State]
&&	Create an AND condition between two logical expressions	([State]="MA") && ([Quantity]>10)
(double pipe)	Create an OR condition between two logical expressions	([State]="MA")    ([State]="CT")
IN	Creates a logical OR condition based on a given list (using curly brackets)	'Store Lookup'[State] IN { "MA", "CT", "NY" }

