Introduction to DAX in Power BI

INTRODUCTION TO DAX IN POWER BI



Jess AhmetContent Developer, DataCamp



What is DAX?

- Data Analysis eXpressions
- Formula language to create calculations
 - Columns, tables, measures
- Based on Excel formulas and functions
 - o e.g., SUM()
- Used in other Microsoft tools
 - Power Pivot and Analysis Services

DAX functions

- Predefined formulas that perform calculations on specific values called arguments
- Function syntax indicates the order of arguments expected
- Function categories
 - Aggregation SUM(), AVERAGE(), COUNT()
 - Date and Time TODAY(), MONTH(), YEAR()
 - Logical IF(), AND(), OR()
 - Text CONCATENATE(), UPPER(), LEFT()
 - And many more...
- DAX reference:
 - https://docs.microsoft.com/en-us/dax/dax-function-reference

DAX functions example

- SUM()
 - Syntax: SUM(<column>)
 - Description: Adds all the numbers in a column.
 - One argument: <column>
 - Example: SUM(Sales)

- LEFT()
 - o Syntax: LEFT(<text>, <num_chars>)
 - Description: Returns the specified number of characters from the start of a text.
 - o Two arguments: <text> , <num_chars>
 - Example: LEFT('DataCamp', 4) = "Data"

Creating calculated columns

- Expands our existing datasets without editing the source data
- Evaluates at a row level and adds a new column to an existing table
- Calculated at data load or when the data is refreshed

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- DAX example: Price_w_tax = Price + (Price * Tax)

Item	Price	Tax
Α	\$ 20	25%
В	\$ 45	0%
С	\$ 100	15%

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Item	Price	Tax	Price_w_tax
A	\$ 20	25%	\$25
В	\$ 45	0%	\$45
С	\$ 100	15%	\$115

Creating calculated measures

- Enables complex calculations
- Aggregates multiple rows and adds a new field that can be added to visualizations
- Calculated at query time as you interact and filter
 - More efficient because the calculation is not run every time the table is accessed
- Two ways to create a measure
 - Write a measure from scratch
 - Use the built-in Quick Measure tool

Creating calculated measures

Item	Price	Tax	Price_w_tax
Α	\$ 20	25%	\$25
В	\$ 45	0%	\$45
С	\$ 100	15%	\$115

- Total_price_w_tax = SUM(Price_w_tax)
- Total_price_w_tax = \$25 + \$45 + \$115 = \$185

Summary

Calculated columns:

- Evaluate for each row
- Add a new column to an existing table
- Calculated at data load or when the data is refreshed

Calculated measures:

Summary

Calculated columns:

- For evaluating each row
- Add a new column to an existing table
- Calculated at data load or when the data is refreshed

Item	Price	Tax	Price_w_tax
Α	\$ 20	25%	\$25
В	\$ 45	0%	\$45
С	\$ 100	15%	\$115

Calculated measures:

- For aggregating multiple rows
- Results in another field that you can add to a visualization
- Calculated at query time as you interact and filter
- Total_price_w_tax = SUM(Price_w_tax)

Summary

Calculated columns:

- For evaluating each row
- Add a new column to an existing table
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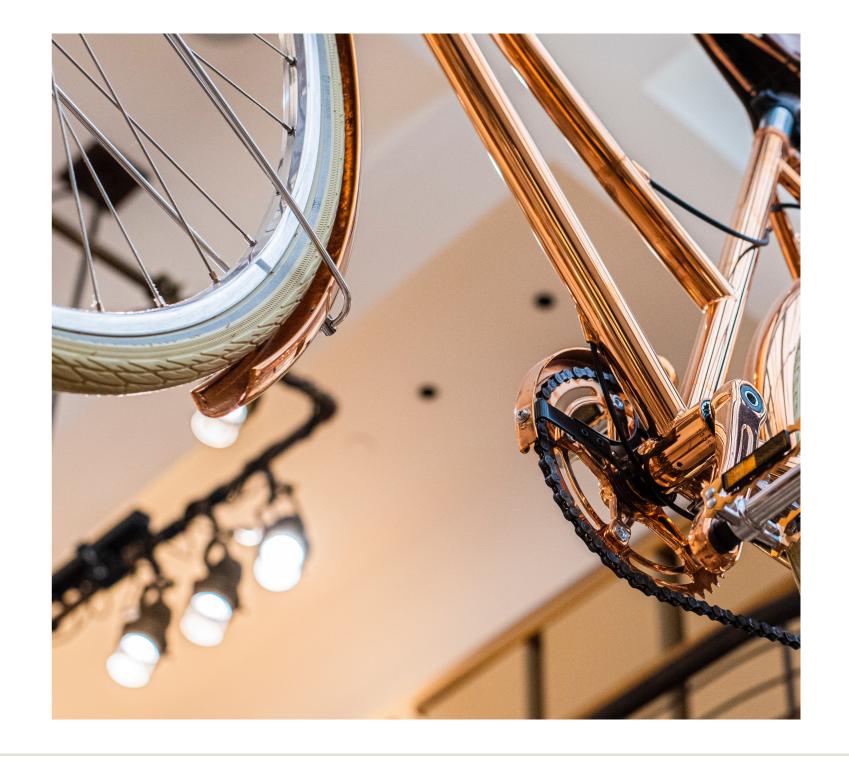
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- For aggregating multiple rows
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- Total_price_w_tax = SUM(Price_w_tax)

¹ Calculated tables will be covered later.

Adventure Works

- Sells bikes and bike-parts globally
- Table: Sales
 - Transactional data for each order line of a sale
 - Contains categorical data including product category



Let's practice!

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Creating calculated columns and measures

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