Introduction to DAX in Power BI

INTRODUCTION TO DAX IN POWER BI



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What is DAX?

- Data Analysis eXpressions
- Formula language to create calculations
  - Columns, tables, measures
- Based on Excel formulas and functions
  - 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()`
  - *Syntax:* `LEFT(<text>, <num_chars>)`
  - *Description:* Returns the specified number of characters from the start of a text.
  - *Two arguments:* `<text>` , `<num_chars>`
  - *Example:* `LEFT('DataCamp', 4)` = "Data"

Creating calculated columns

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- Evaluates at a row level and adds a new column to an existing table
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- DAX example: `Price_w_tax = Price + ( Price * Tax )`

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A	$ 20	25%
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Item	Price	Tax	Price_w_tax
A	$ 20	25%	**$25**
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C	$ 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
A	$ 20	25%	**$25**
B	$ 45	0%	**$45**
C	$ 100	15%	**$115**

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

Summary

Calculated columns:

- For evaluating each row
- Add a new column to an existing table
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- Results in another field that you can add to a visualization
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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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