

# 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 )`

Item	Price	Tax
A	\$ 20	25%
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B	\$ 45	0%	<b>\$45</b>
C	\$ 100	15%	<b>\$115</b>

# 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%	<b>\$25</b>
B	\$ 45	0%	<b>\$45</b>
C	\$ 100	15%	<b>\$115</b>

- `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:

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## 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:

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- 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)`

<sup>1</sup> 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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# Let's practice!

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