

Introduction to DAX

INTRODUCTION TO POWER BI



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What is DAX?

- Data Analysis Expressions
- Language to create calculations in Power BI
 - Columns, tables, measures
- Based on Excel formulas and functions
 - e.g., SUM()

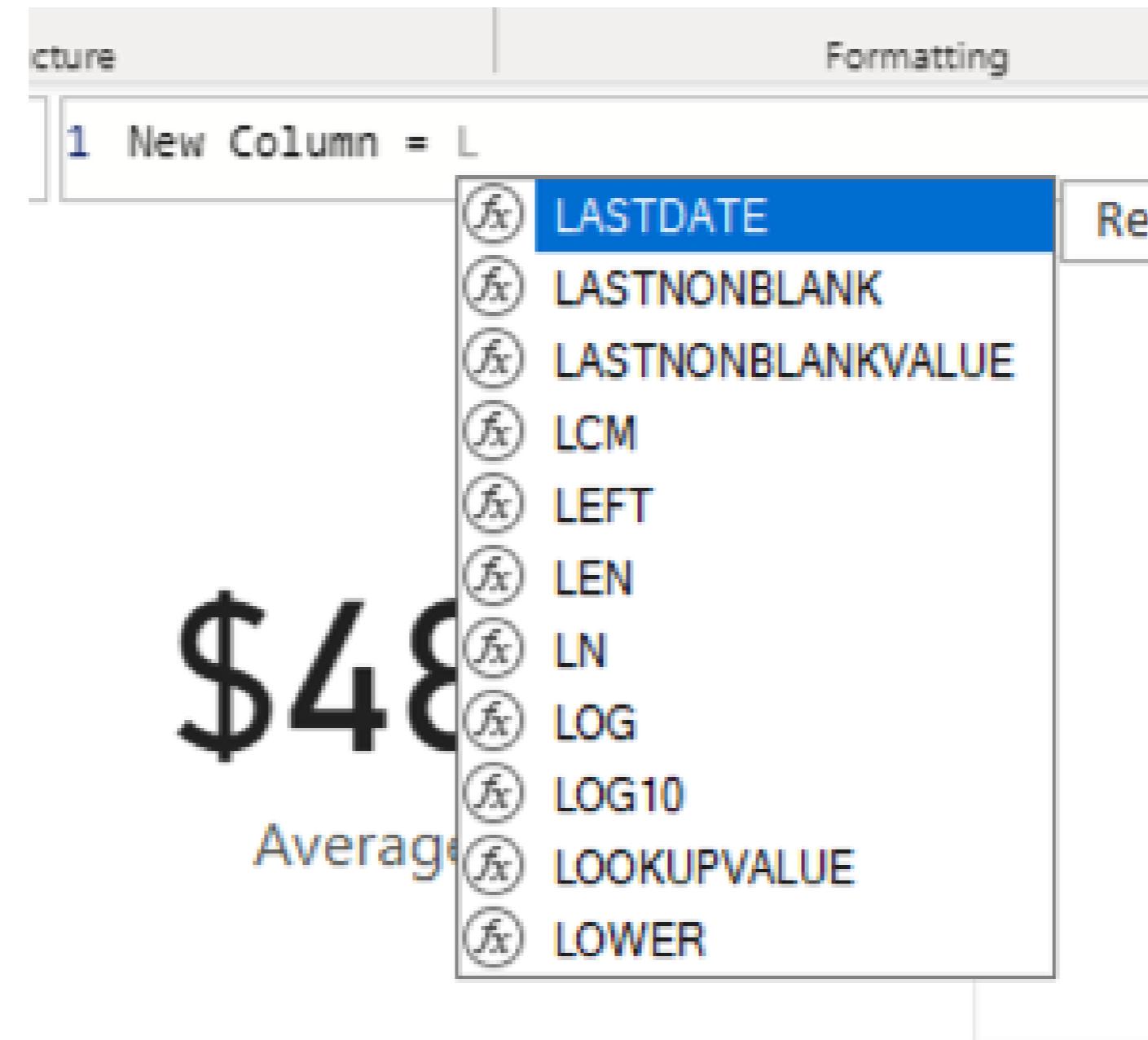
DAX functions

- Functions
 - Predefined formulas that perform calculations on specific values called **arguments**
 - **Function syntax** indicates the order of arguments expected
- Microsoft documentation:
 - <https://docs.microsoft.com/en-us/dax/dax-function-reference>

DAX functions examples

- `SUM()`
 - *Syntax:* `SUM(<column>)`
 - *Description:* Adds all the numbers in a column.
 - *One argument:* `<column>`
- `LEFT()`
 - *Syntax:* `LEFT(<text>, <num_chars>)`
 - *Description:* Returns the specified number of characters from the start of a text.
 - *Example:* `LEFT('DataCamp', 4) = 'Data'`
 - *Two arguments:* `<text> , <num_chars>`

Power BI Intellisense

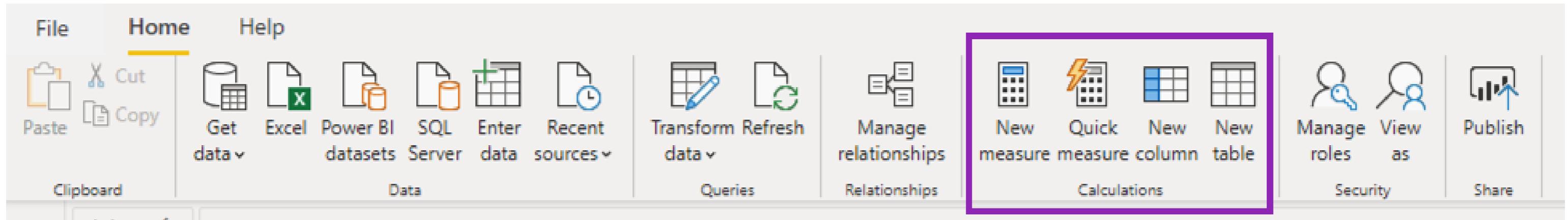


Power BI Intellisense

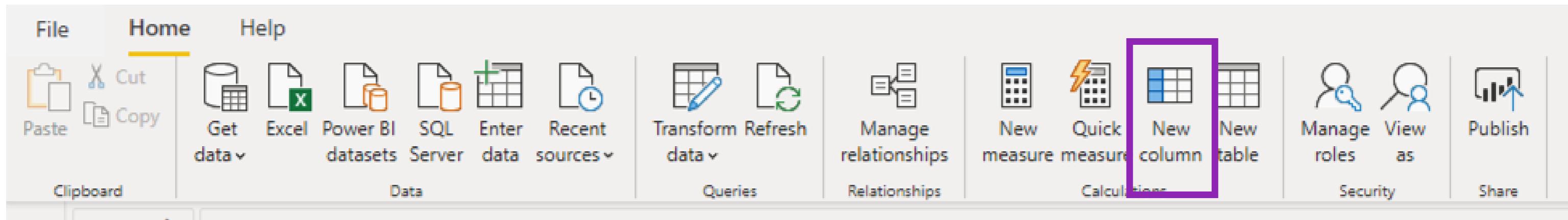
The screenshot shows a Power BI interface with a formula bar at the top. The formula bar contains the text "1 New Column = LEFT(" followed by a cursor. Below the formula bar is a tooltip box with the following details:

- Text**: LEFT(Text, [NumberOfCharacters])
- Description**: Returns the specified number of characters from the start of a text string.

Creating calculations



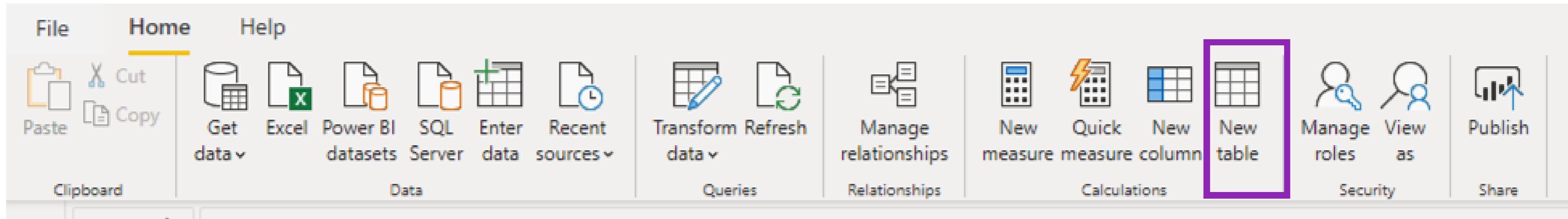
Creating calculated columns



- Can be based on other columns from any table
- Calculated at data load and when the data is refreshed

Creating calculated tables

It is not supported in Power BI to connect two columns to the same table so we need to create a new table.

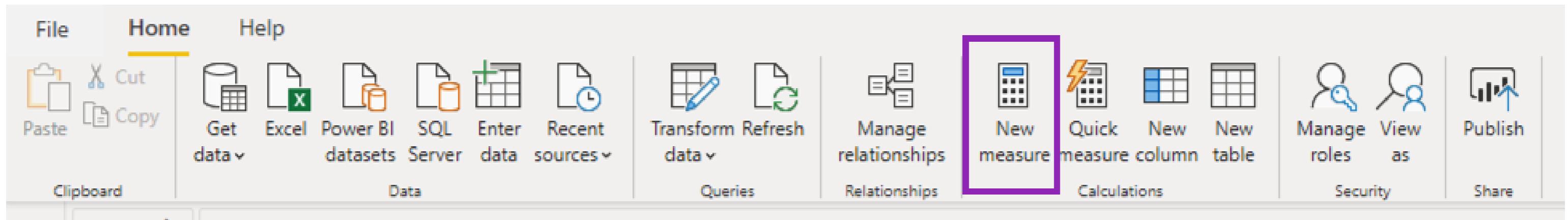


- Can be based on other columns from any table
- Calculated at data load and when the data is refreshed

Example uses:

- Blank table
- Copy an existing table

Creating calculated measures



- Defined calculations
- Calculated as you interact and filter
- Calculated at **query time**
 - More efficient than every time a table is accessed

For example, if we filter on a specific year, our calculated measures will be based on that year only.

Calculated measures vs columns

Calculated columns:

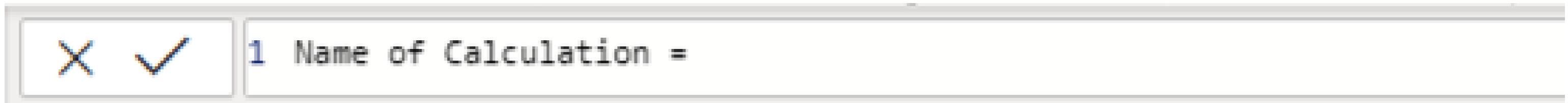
- For evaluating each row
- Add a new column to an existing table
- *Example:* Profit
 - The Sales Amount column minus the Cost column and the Tax column

Calculated measures:

- For aggregating multiple rows
- Results in another field that you can add to a visualization
- *Example:* Average Transaction
 - The average of the values in the Sales Amount column

Creating calculations

Start with a name and an equal sign:



AdventureWorks Data Warehouse

- Fact Table:
 - FactSales.csv
- Dimension Tables:
 - DimCustomer.csv
 - DimProduct.xlsx
 - DimSalesTerritory.csv
 - DimDate.csv



Demo time!

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Calculated tables and columns

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Let's practice!

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Calculated measures

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Calculated measures and Quick Measures

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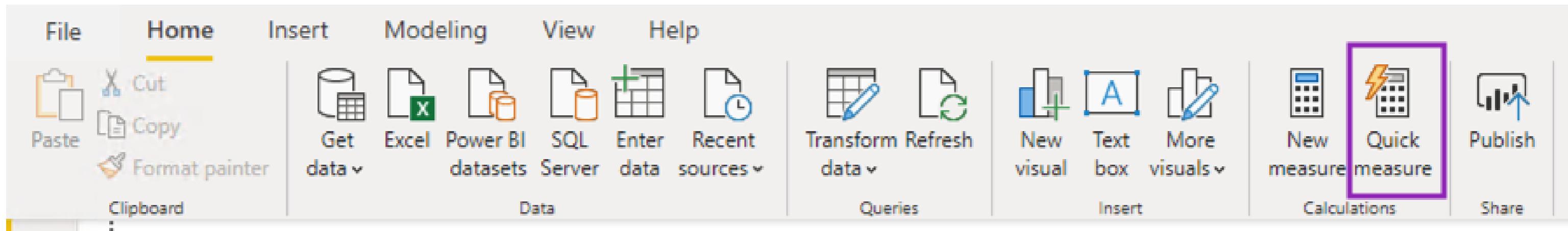
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Calculate function

Syntax: `CALCULATE(Aggregation, filter, [filter]...)`

- Aggregation:
 - `SUM()` , `COUNT()` , `AVERAGE()` , etc
 - Another calculated measure
- Filter:
 - `ProductColor = "RED"`
 - `SalesLocation = "New York"`
- Example: *Calculate sales for New York Office*
 - `NYC Sales = Calculate(SUM[Sales], SalesLocation= "New York")`

Quick measures



Quick Measures

- Complex measures without writing DAX
- Menu provides calculations under 6 categories:
 - *Aggregates, Filters, Time intelligence, Totals, Mathematical Operations, Text*
- All you need to do is add the fields needed

Quick measures

Calculation

Select a calculation

Select a calculation

Aggregate per category

- Average per category
- Variance per category
- Max per category
- Min per category
- Weighted average per category

Filters

- Filtered value
- Difference from filtered value
- Percentage difference from filtered value
- Sales from new customers

Time intelligence

- Year-to-date total
- Quarter-to-date total
- Month-to-date total

Time-based calculations

- A date dimension allows us to calculate time values easily
 - e.g., year to date, quarter over quarter growth
- Provide the ability to create in-depth time analysis



Demo time!

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Calculate function and Quick Measures

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Time-based calculations

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Let's practice!

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Congratulations!

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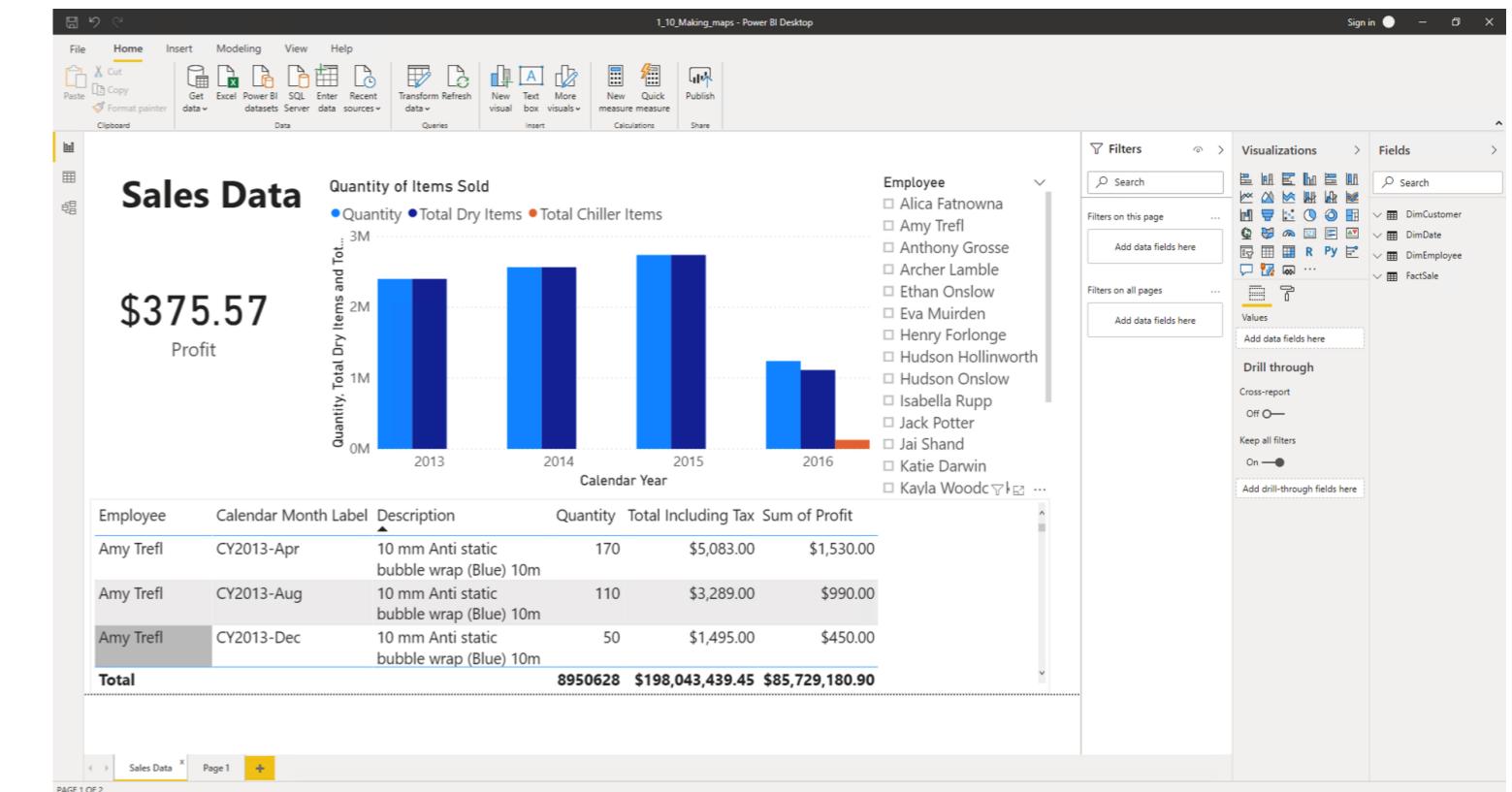


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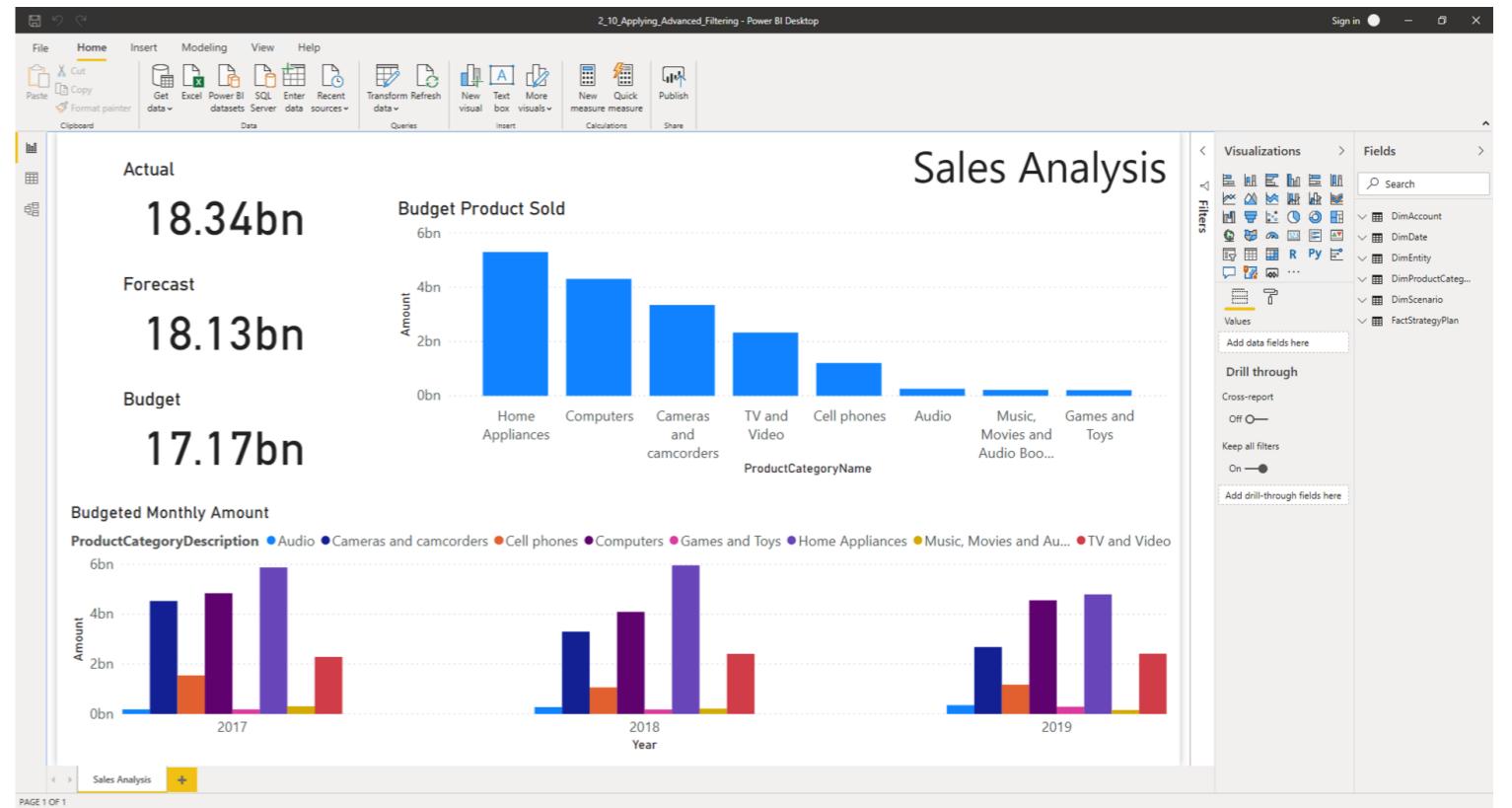
Chapter 1: Getting Started with Power BI

- Data, Model, and Report view
- Loading multiple datasets
- Building a data model
- First interactive report
- Power Query Editor



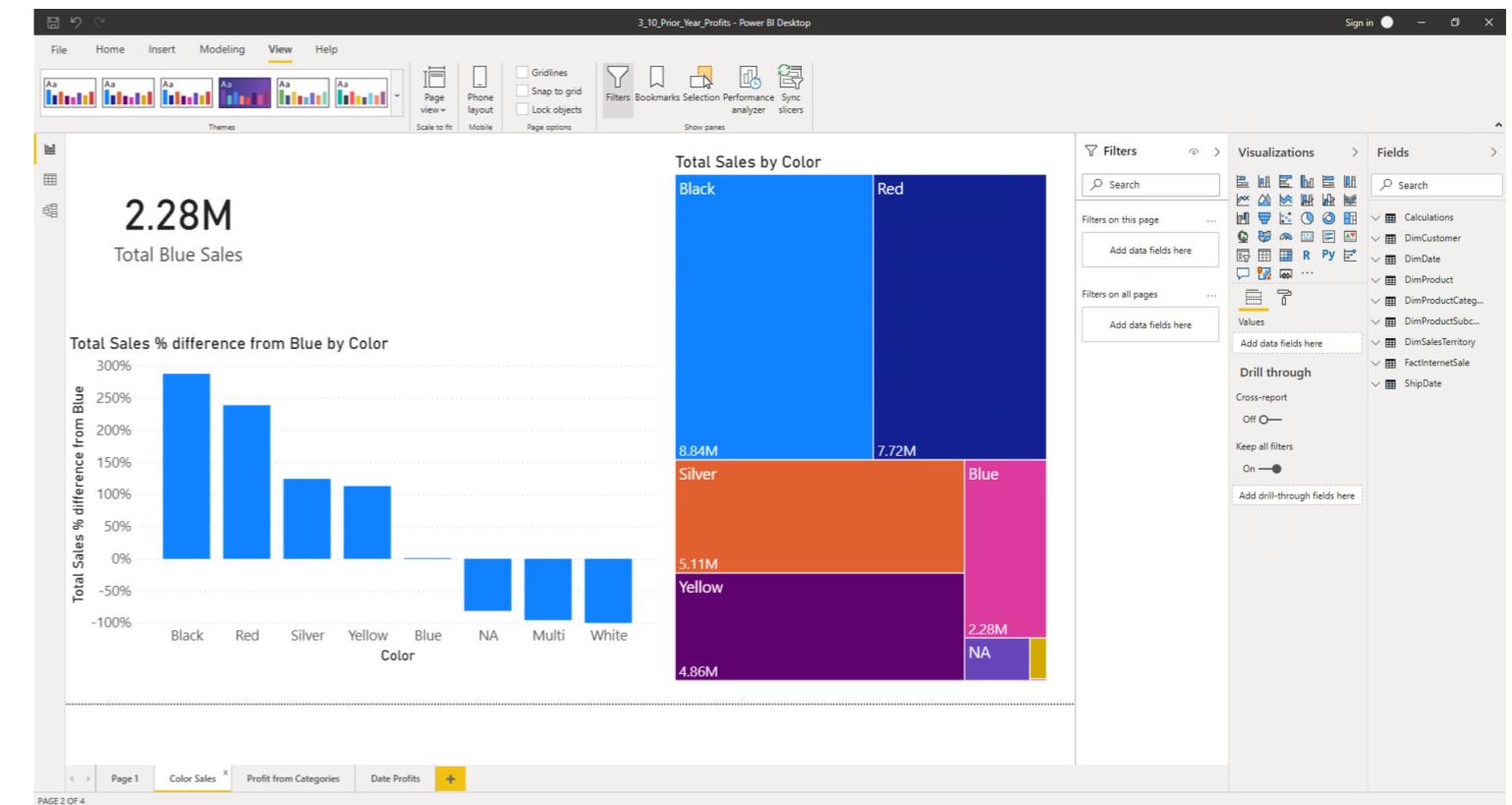
Chapter 2: Visualizing data

- Different types of visualization
- Hierarchies
- Drill-down paths
- Sorting
- Filtering
- Controlling interactivity



Chapter 3: Creating Calculations with DAX

- DAX (Data Analysis Expressions) functions
- Calculated columns and tables
- Calculated measures
- Quick Measures



Congratulations!

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