

# 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()

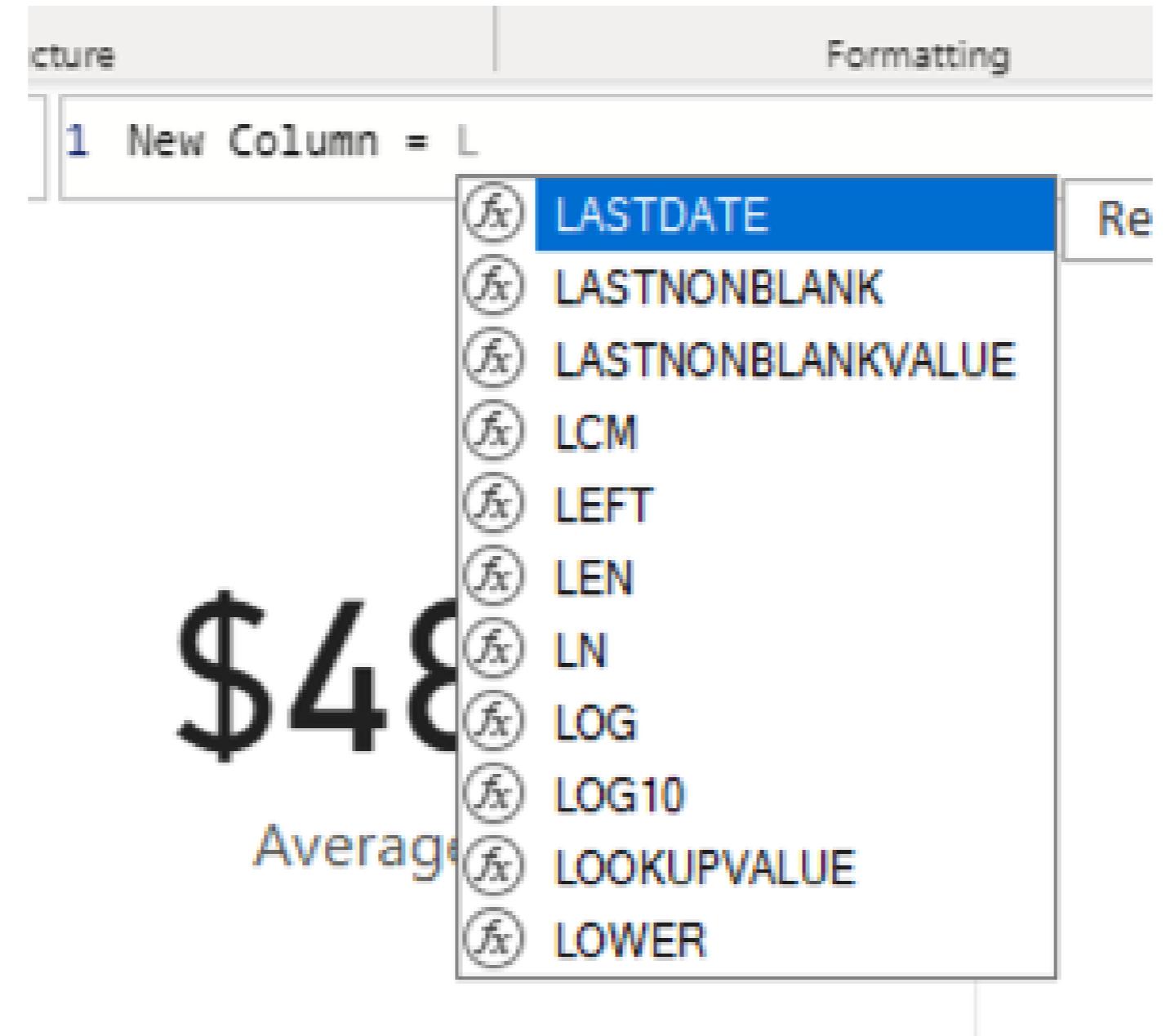
# DAX functions

- 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

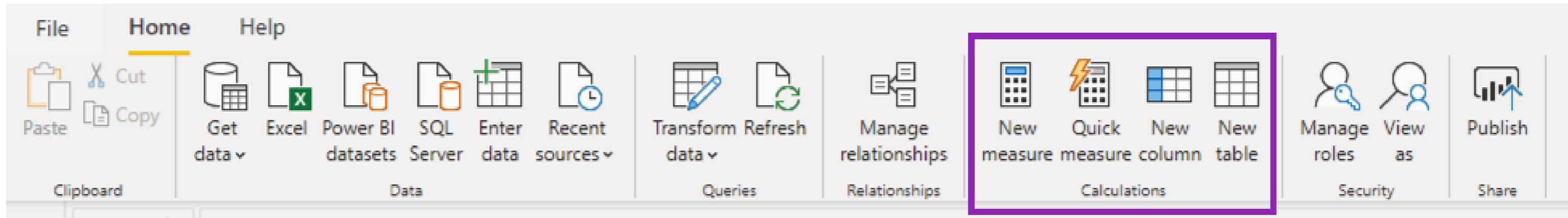
The screenshot shows a Power BI interface with a search bar at the top. Below it, a table-like structure displays a single row with three columns: 'Name', 'Formatting', and 'Properties'. In the 'Name' column, the text '1 New Column = LEFT(' is visible, with the word 'LEFT' highlighted in blue. A tooltip box is overlaid on the screen, containing the function signature 'LEFT(Text, [NumberOfCharacters])' and a descriptive text: 'Returns the specified number of characters from the start of a text string.'

Name	Formatting	Properties
1 New Column = LEFT(		

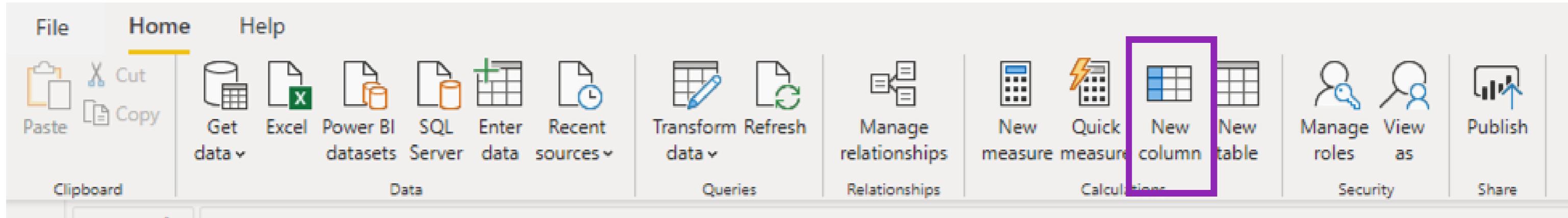
LEFT(Text, [NumberOfCharacters])

Returns the specified number of characters from the start of a text string.

# Creating calculations

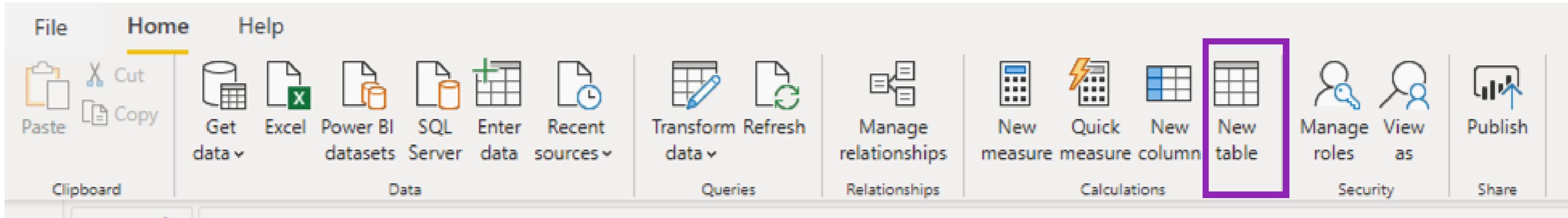


# Creating calculated columns



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

# Creating calculated tables

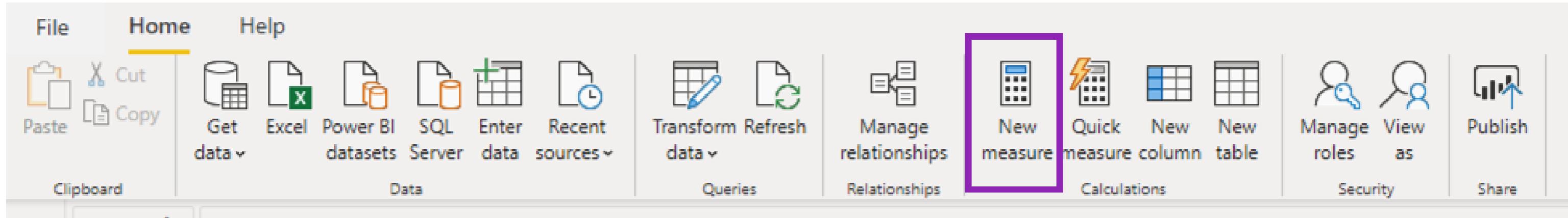


- Can be based on other columns from any table
- Calculated at data load and when the data is refreshed

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

# 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:

X ✓ 1 Name of Calculation =

X ✓ 1 Average Transaction = AVERAGE(FactInternetSale[SalesAmount])

# 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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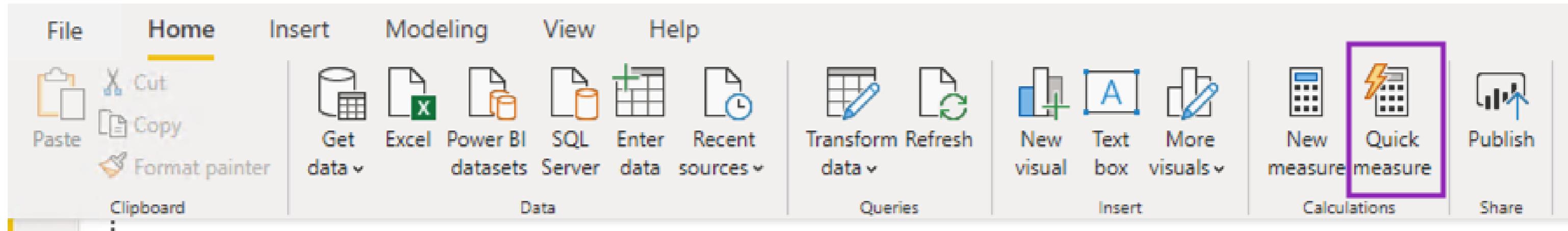
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# Calculate function

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
- Year-over-year change
- Quarter-over-quarter change

# 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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# **Let's practice!**

## **INTRODUCTION TO POWER BI**

# Time-based calculations

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# **Let's practice!**

## **INTRODUCTION TO POWER BI**

# Congratulations!

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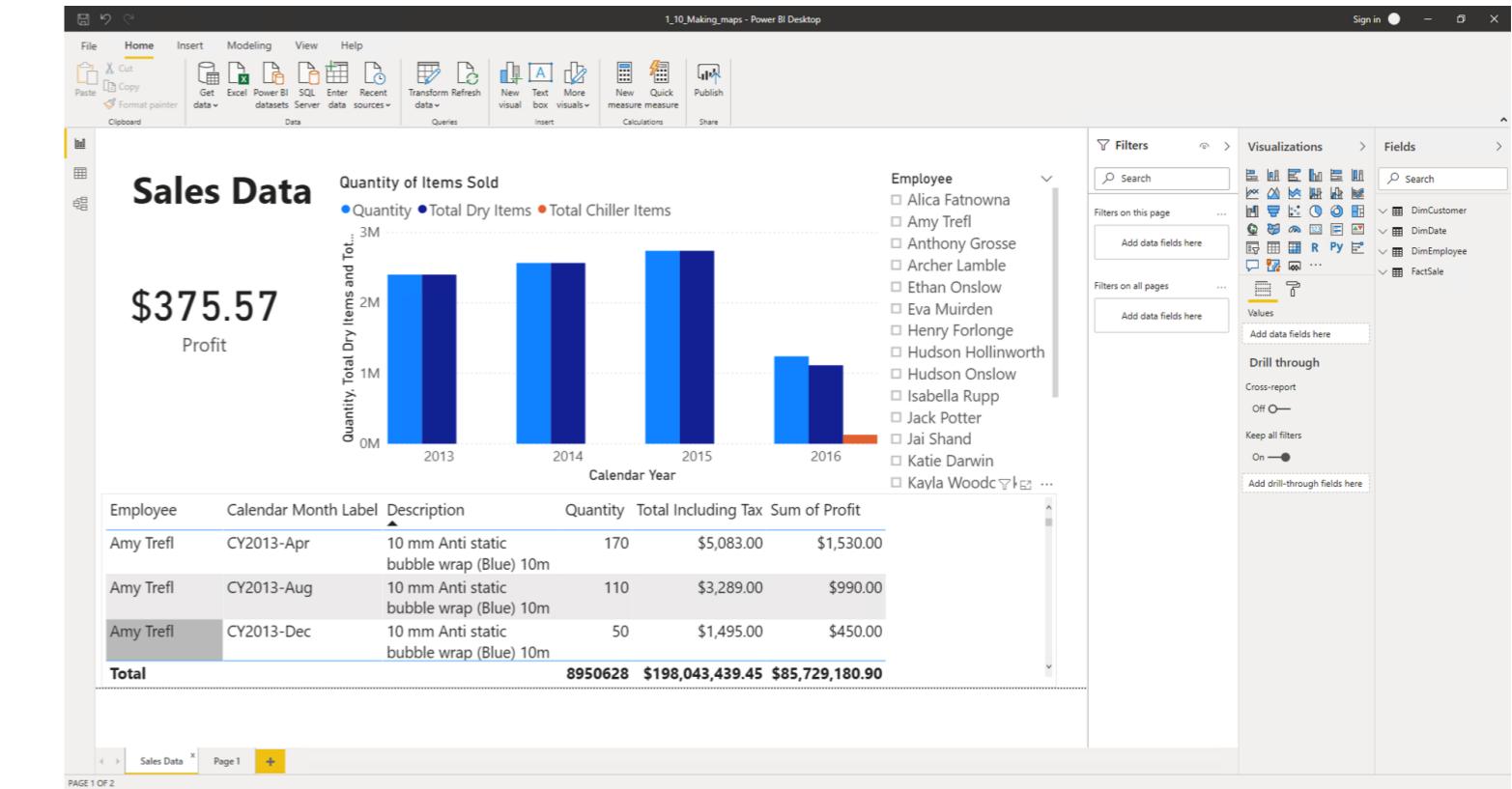


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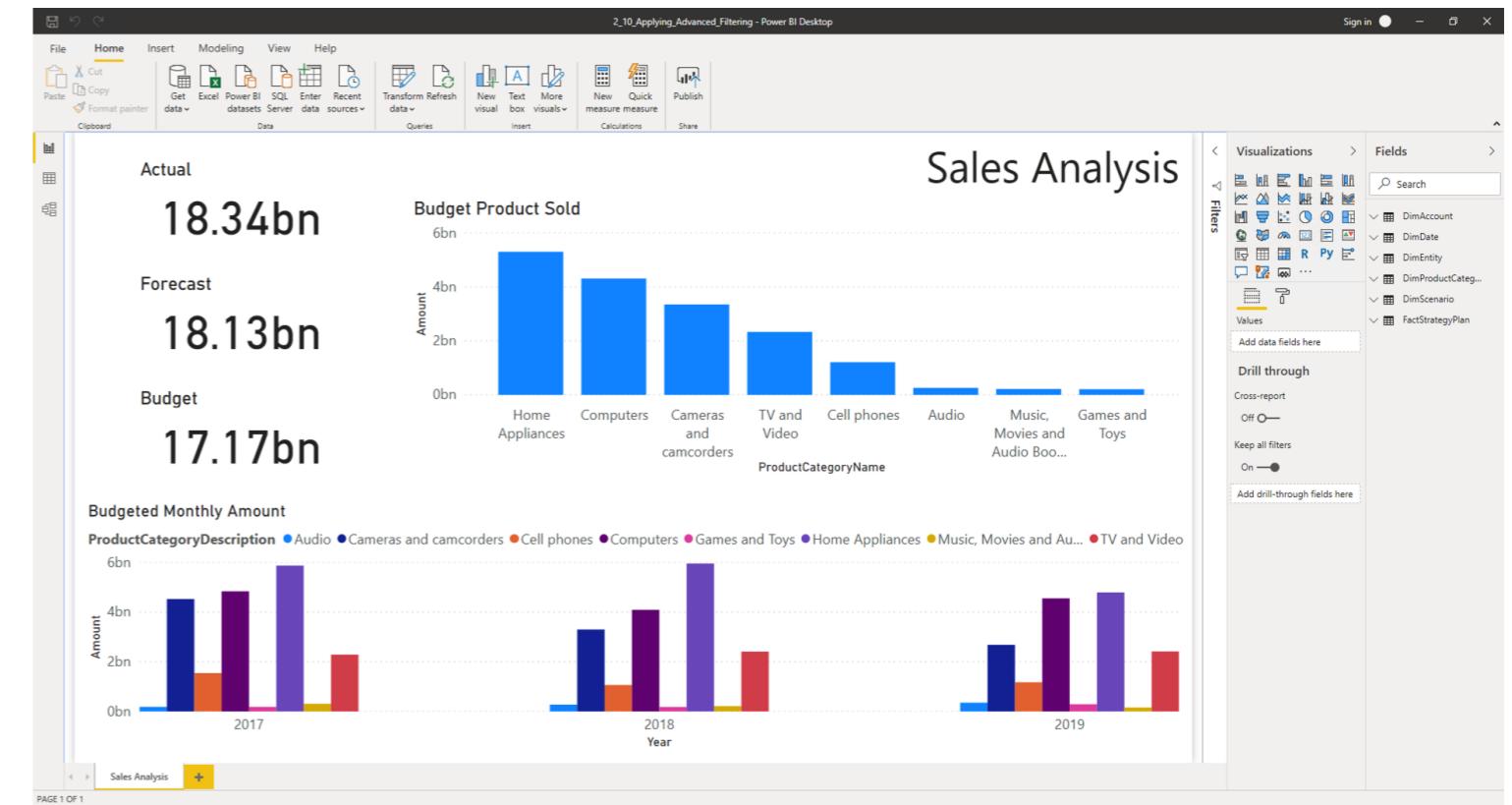
# Chapter 1: Getting Started with Power BI

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



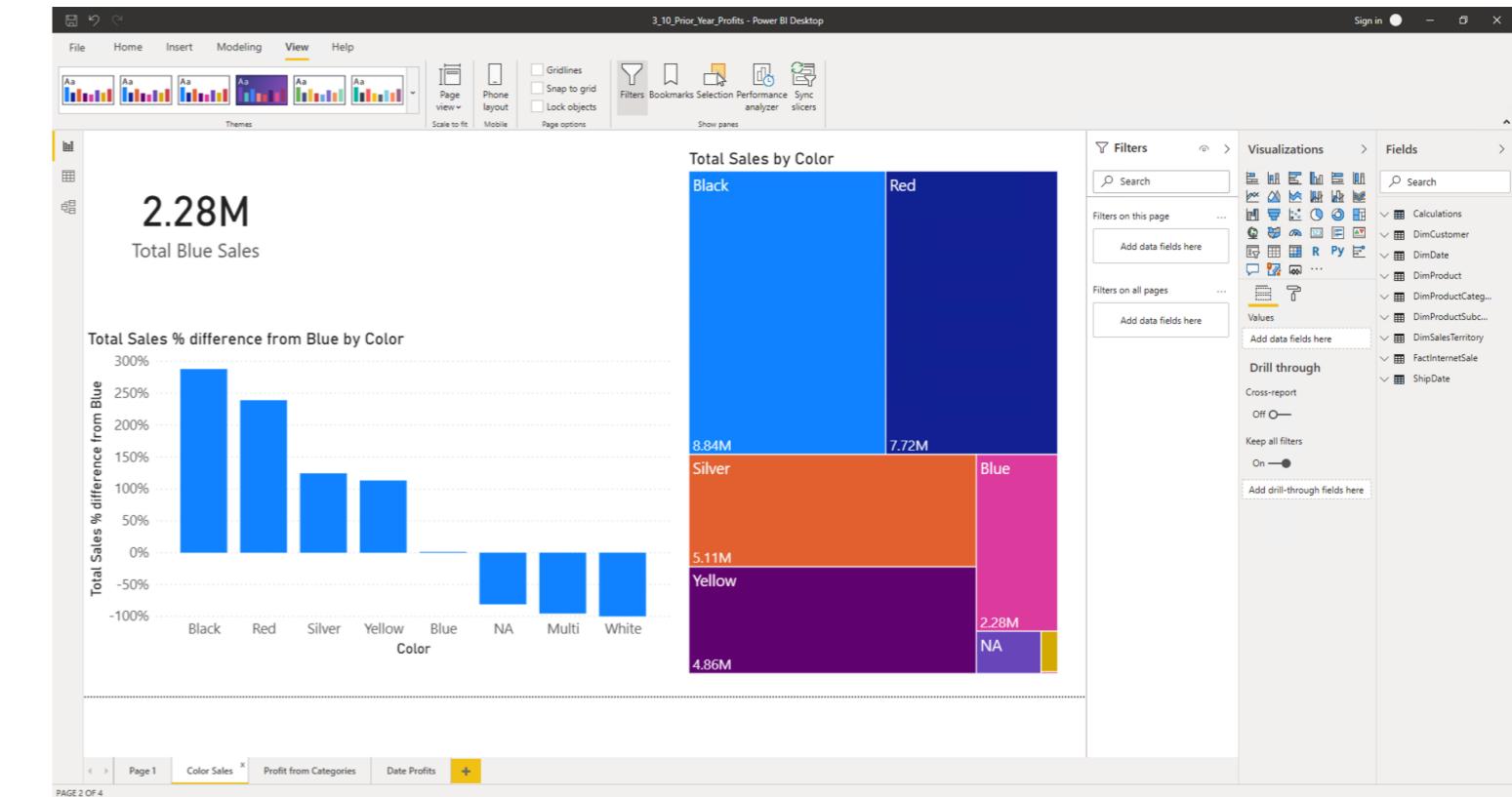
# Chapter 2: Visualizing data

- 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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