

Introduction to DAX

INTRODUCTION TO POWER BI



Lis Sulmont
Curriculum Manager

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()

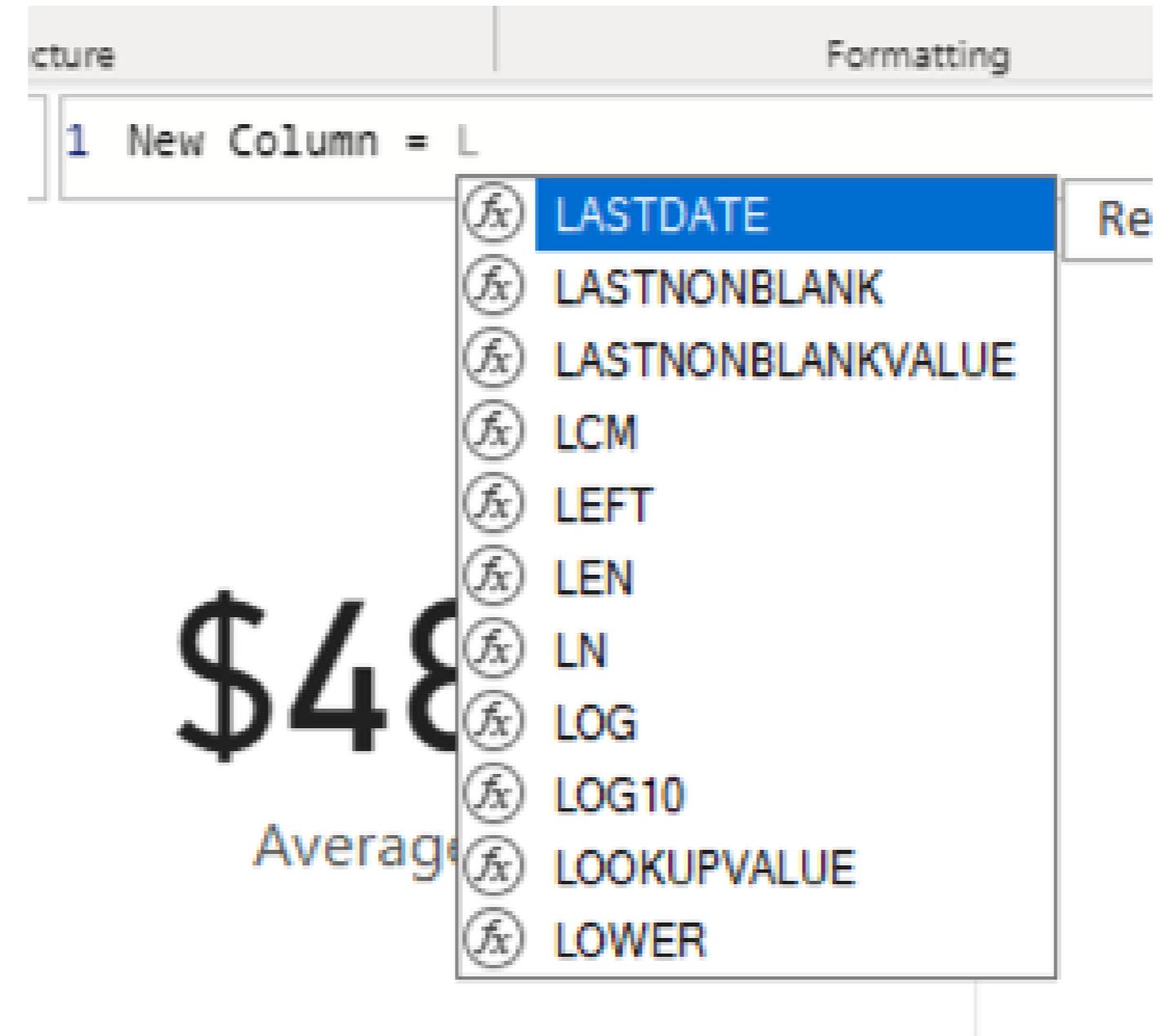
DAX functions

- 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

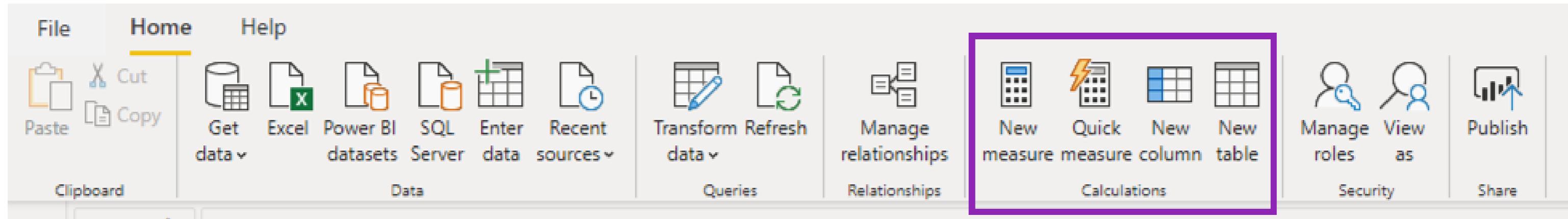
The screenshot shows a Power BI Intellisense interface. At the top, there are tabs for 'Query', 'Formatting', and 'Properties'. Below the tabs, a code snippet is displayed: '1 New Column = LEFT('. A tooltip box is open over the word 'LEFT', containing the function signature 'LEFT(Text, [NumberOfCharacters])' and a description: 'Returns the specified number of characters from the start of a text string.'

1 New Column = LEFT(

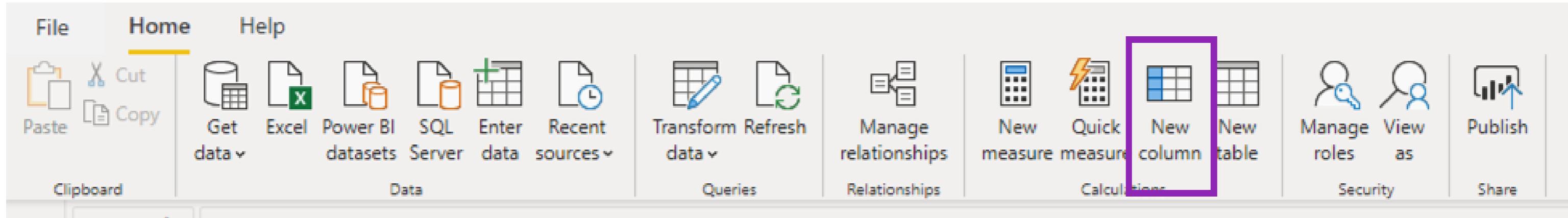
LEFT(Text, [NumberOfCharacters])

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

Creating calculations

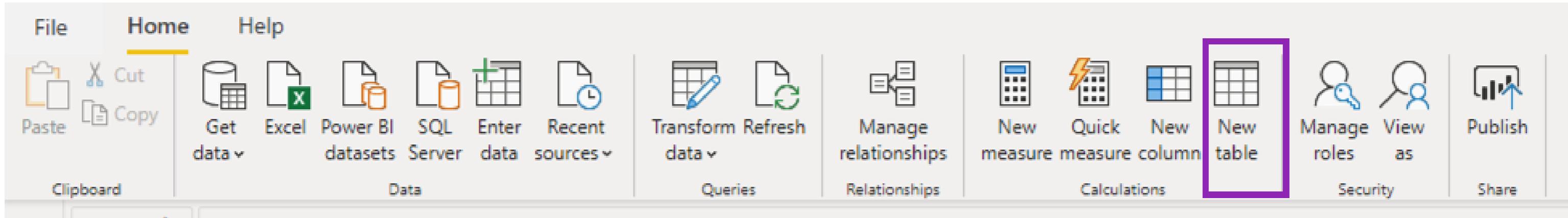


Creating calculated columns



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

Creating calculated tables

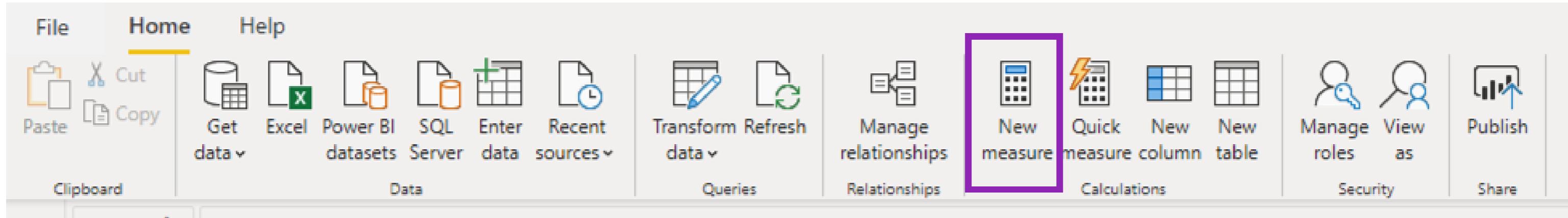


- Can be based on other columns from any table
- Calculated at data load and when the data is refreshed

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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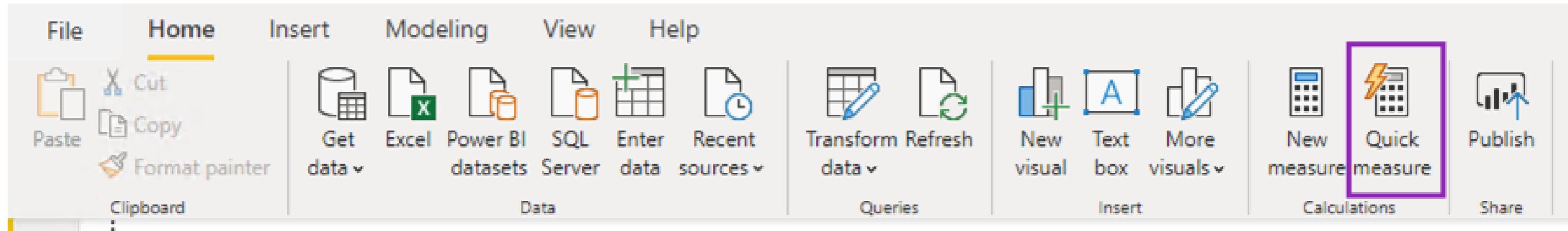
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Calculate function

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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Time-based calculations

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Let's practice!

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Congratulations!

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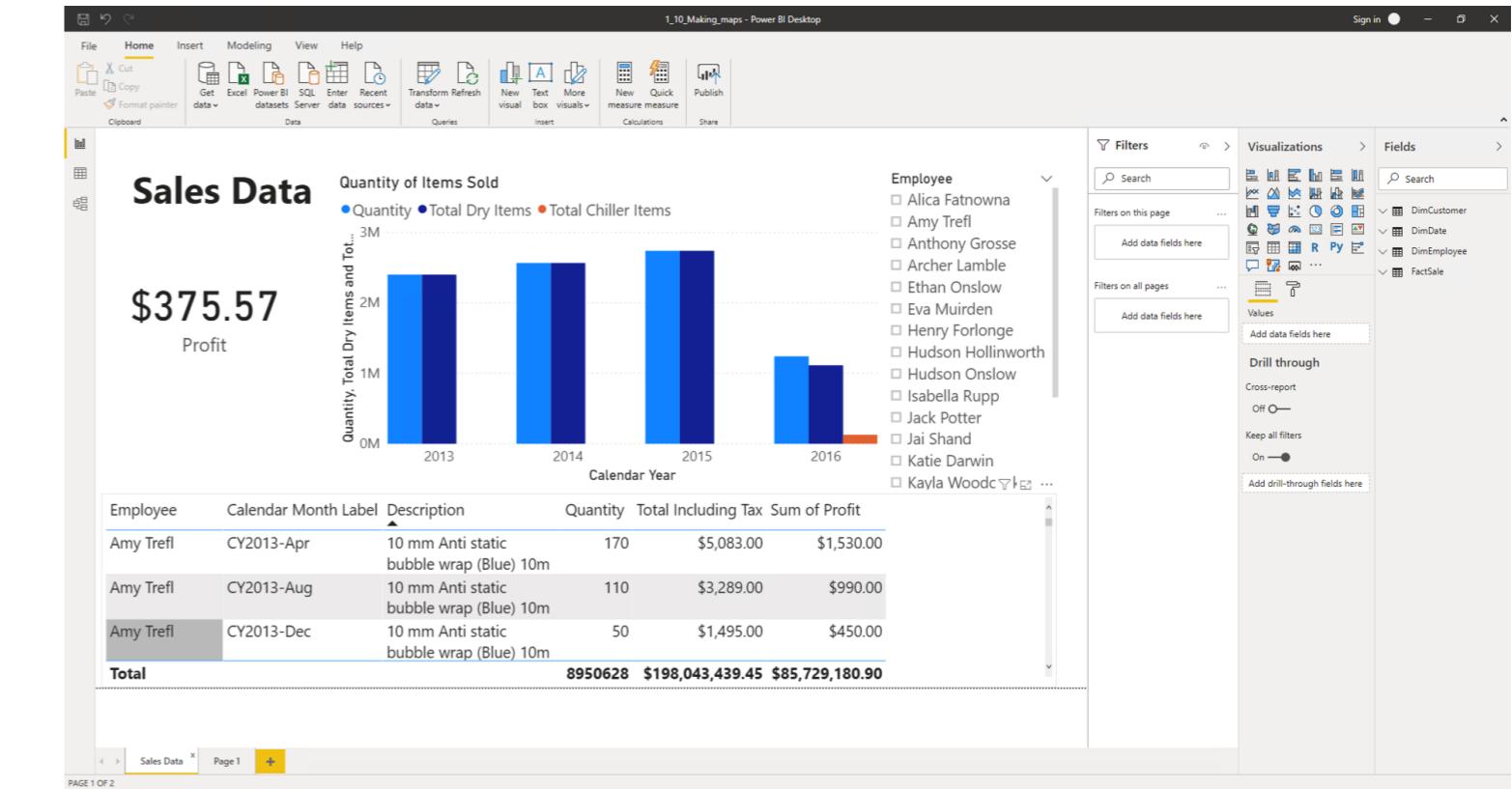


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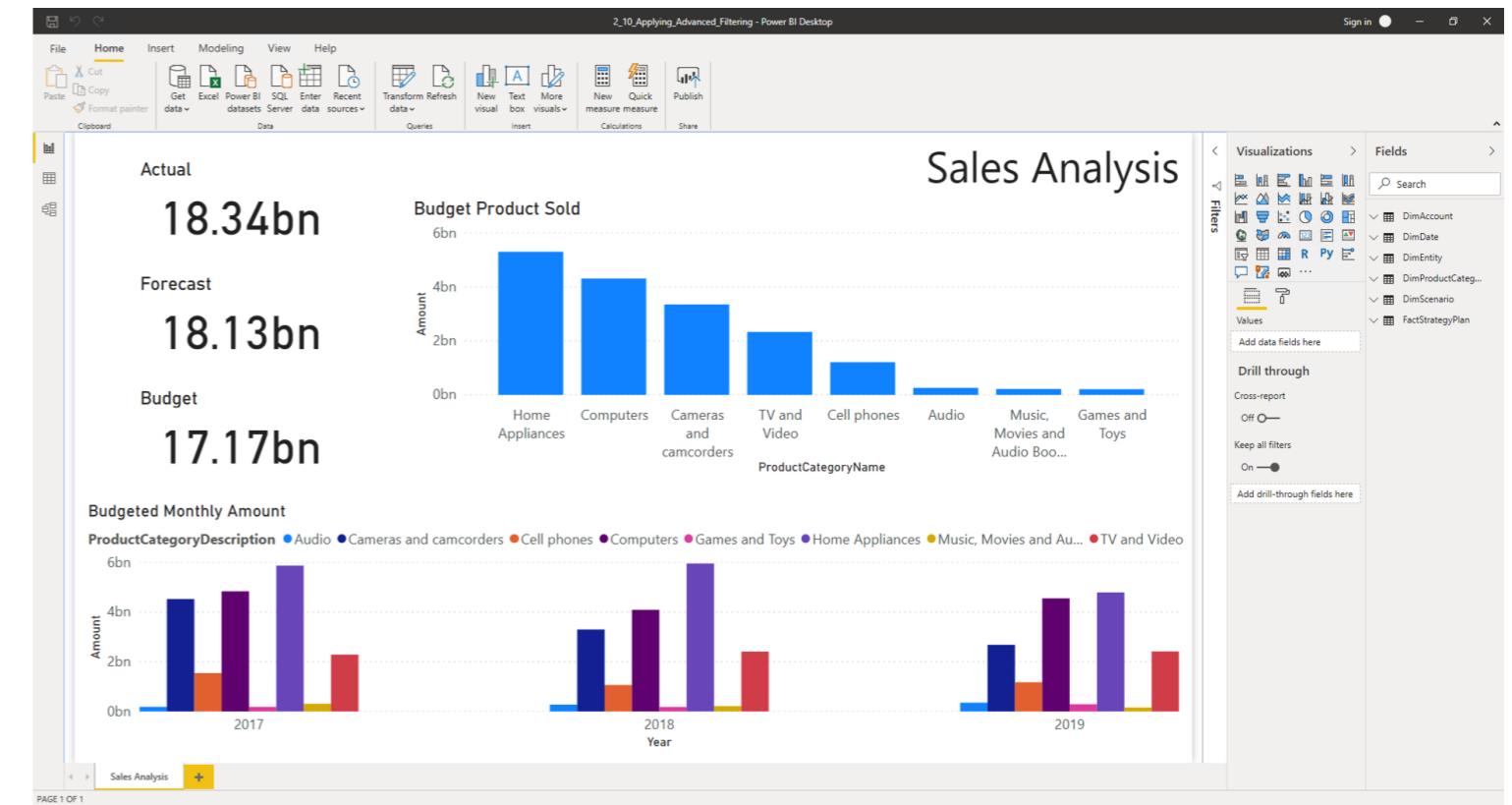
Chapter 1: Getting Started with Power BI

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



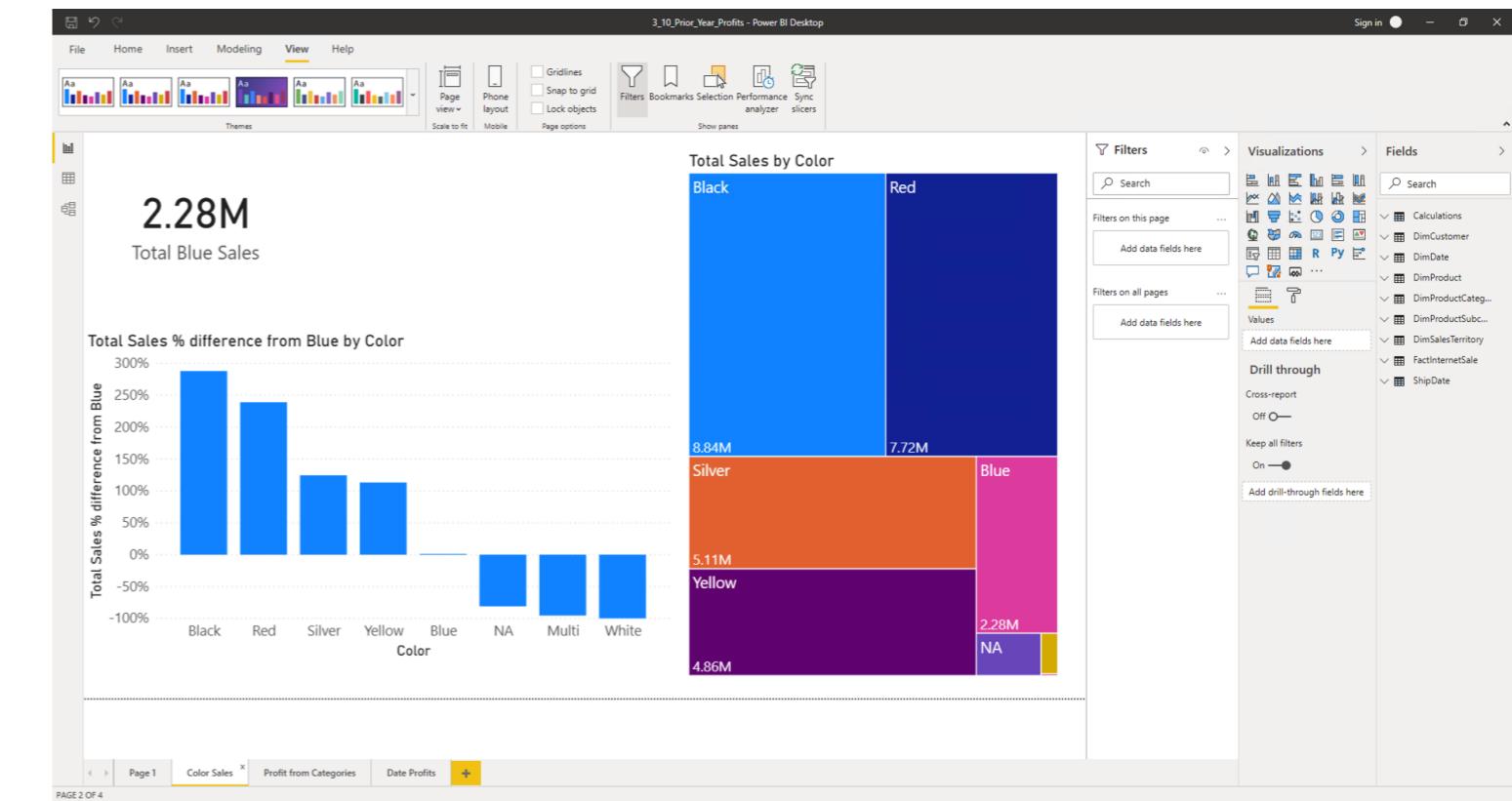
Chapter 2: Visualizing data

- 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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