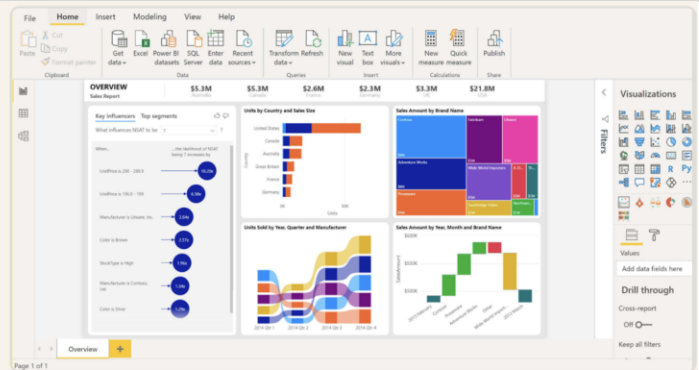


What is Power BI?

Power BI is a business intelligence tool that allows you to effectively report insights through easy-to-use customizable visualizations and dashboards.



> Why use Power BI?

<> Easy to use—no coding involved

Integrates seamlessly with any data source

Fast and can handle large datasets

> Power BI Components

There are three components to Power BI—each of them serving different purposes

POWER BI DESKTOP

Free desktop application that provides data analysis and creation tools.

POWER BI SERVICE

Cloud-based version of Power BI with report editing and publishing features.

POWER BI MOBILE

A mobile app of Power BI, which allows you to author, view, and share reports on the go.

> Getting started with Power BI

There are three main views in Power BI



REPORT VIEW

This view is the default view, where you can visualize data and create reports



DATA VIEW

This view lets you examine datasets associated with your reports




MODEL VIEW

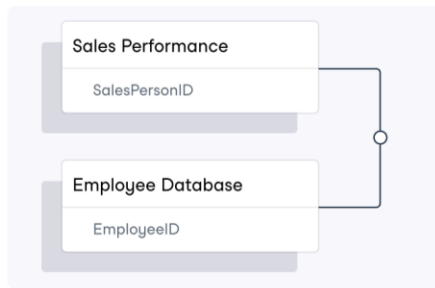
This view helps you establish different relationships between datasets


> Visualizing your first dataset

Upload datasets into Power BI


- Underneath the *Home* tab, click on *Get Data*
- Choose any of your datasets and double click
- Click on *Load* if not prior data needs processing
- If you need to transform the data, click *Transform* which will launch Power Query. Keep reading this cheat sheet for how to apply transformations in Power Query.
- Inspect your data by clicking on the  *Data View*

Create relationships in Power BI



- If you have different datasets you want to connect. First, upload them into Power BI
- Click on the  *Model View* from the left-hand pane
- Connect key columns from different datasets by dragging one to another (e.g., EmployeeID to e.g., SalespersonID)

Create your first visualization


- Click on the  *Report View* and go to the *Visualizations* pane on the right-hand side
- Select the type of visualization you would like to plot your data on. Keep reading this cheat to learn different visualizations available in Power BI.
- Under the *Field* pane on the right-hand side, drag the variables of your choice into *Values* or *Axis*.

Values let you visualize aggregate measures (e.g. Total Revenue)

Axis let you visualize categories (e.g. Sales Person)

Aggregating data













Power BI sums numerical fields when visualizing them under *Values*. However, you can choose different aggregations

- Select the visualization you just created
- Go to the *Visualizations* section on the right-hand side
- Go to *Values*—the visualized column should be there
- On the selected column—click on the dropdown arrow  and change the aggregation (i.e., AVERAGE, MAX, COUNT, etc..)



Data Visualizations in Power BI

Power BI provides a wide range of data visualizations. Here is a list of the most useful visualizations you have in Power BI

-  **Bar Charts:** Horizontal bars used for comparing specific values across categories (e.g. sales by region)
-  **Column Charts:** Vertical columns for comparing specific values across categories
-  **Line Charts:** Used for looking at a numeric value over time (e.g. revenue over time)
-  **Area Chart:** Based on the line chart with the difference that the area between the axis and line is filled in (e.g. sales by month)
-  **Scatter:** Displays one set of numerical data along the horizontal axis and another set along the vertical axis (e.g. relation age and loan)
-  **Combo Chart:** Combines a column chart and a line chart (e.g. actual sales performance vs target)
-  **Treemaps:** Used to visualize categories with colored rectangles, sized with respect to their value (e.g. product category based on sales)
-  **Pie Chart:** Circle divided into slices representing a category's proportion of the whole (e.g. market share)
-  **Donut Chart:** Similar to pie charts; used to show the proportion of sectors to a whole (e.g. market share)
-  **Maps:** Used to map categorical and quantitative information to spatial locations (e.g. sales per state)
-  **Cards:** Used for displaying a single fact or single data point (e.g. total sales)
-  **Table:** Grid used to display data in a logical series of rows and columns (e.g. all products with sold items)



Power Query Editor in Power BI

Power Query is Microsoft's data transformation and data preparation engine. It is part of Power BI Desktop, and lets you connect to one or many data sources, shape and transform data to meet your needs, and load it into Power BI.

Open the Power Query Editor

While loading data

- Underneath the *Home* tab, click on *Get Data*
- Choose any of your datasets and double click
- Click on *Transform Data*

When data is already loaded

- Go to the  *Data View*
- Under *Queries* in the *Home* tab of the ribbon, click on *Transform Data* drop-down, then on the *Transform Data* button

Using the Power Query Editor

Removing rows

You can remove rows dependent on their location, and properties

- Click on the *Home* tab in the *Query* ribbon
- Click on *Remove Rows* in the *Reduce Rows* group
- Choose which option to remove, whether *Remove Top Rows*, *Remove Bottom Rows*, etc..
- Choose the number of rows to remove
- You can undo your action by removing it from the *Applied Steps* list on the right-hand side

Adding a new column

You can create new columns based on existing or new data

- Click on the *Add Column* tab in the *Query* ribbon
- Click on *Custom Column* in the *General* group
- Name your new column by using the *New Column Name* option
- Define the new column formula under the custom column formula using the available data

Replace values

You can replace one value with another value wherever that value is found in a column

- In the Power Query Editor, select the cell or column you want to replace
- Click on the column or value, and click on *Replace Values* under the *Home* tab under the *Transform* group
- Fill the *Value to Find* and *Replace With* fields to complete your operation

Appending datasets

You can append one dataset to another

- Click on *Append Queries* under the *Home* tab under the *Combine* group
- Select to append either *Two tables* or *Three or more tables*
- Add tables to append under the provided section in the same window

Merge Queries

You can use merge tables based on a related column

- Click on *Merge Queries* under the *Home* tab under the *Combine* group
- Select the first table and the second table you would like to merge
- Select the columns you would like to join the tables on by clicking on the column from the first dataset, and from the second dataset
- Select the *Join Kind* that suits your operation:



- Click on *Ok*—new columns will be added to your current table

Data profiling

Data Profiling is a feature in Power Query that provides intuitive information about your data

- Click on the *View* tab in the *Query* ribbon
- In the *Data Preview* tab—tick the options you want to visualize
- Tick *Column Quality* to see the amount of missing data
- Tick *Column Distribution* to see the statistical distribution under every column
- Tick *Column Profile* to see summary statistics and more detailed frequency information of columns



DAX Expressions

Data Analysis Expressions (DAX) is a calculation language used in Power BI that lets you create calculations and perform data analysis. It is used to create calculated columns, measures, and custom tables. DAX functions are predefined formulas that perform calculations on specific values called arguments.

Sample data

Throughout this section, we'll use the columns listed in this sample table of `sales_data`

deal_size	sales_person	date	customer_name
1,000	Maria Shuttleworth	30-03-2022	Acme Inc.
3,000	Nuno Rocha	29-03-2022	Spotflix
2,300	Terence Mickey	13-04-2022	DataChamp

Simple aggregations

- SUM(<column>) adds all the numbers in a column
- AVERAGE(<column>) returns the average (arithmetic mean) of all numbers in a column
- MEDIAN(<column>) returns the median of numbers in a column
- MIN/MAX(<column>) returns the smallest/biggest value in a column
- COUNT(<column>) counts the number of cells in a column that contain non-blank values
- DISTINCTCOUNT(<column>) counts the number of distinct values in a column.

EXAMPLES

- Sum of all deals — SUM('sales_data'[deal_size])
- Average deal size — AVERAGE('sales_data'[deal_size])
- Distinct number of customers — DISTINCTCOUNT('sales_data'[customer_name])

Logical functions

- IF(<logical_test>, <value_if_true>[, <value_if_false>]) check the result of an expression and create conditional results

EXAMPLES

- Create a column called large_deal that returns "Yes" if deal_size is bigger than 2,000 and "No" otherwise
large_deal = IF('sales_data'[deal_size] > 2000, "Yes", "No")

Text Functions

- LEFT(<text>, <num_chars>) returns the specified number of characters from the start of a text
- LOWER(<text>) converts a text string to all lowercase letters
- UPPER (<text>) converts a text string to all uppercase letters
- REPLACE(<old_text>, <start_num>, <num_chars>, <new_text>) replaces part of a text string with a different text string.

EXAMPLES

- Change column customer_name be only lower case
customer_name = LOWER('sales_data'[customer_name])

Date and time functions

- CALENDAR(<start date>, <end date>) generates a column of continuous sets of dates
- DATE(<year>, <month>, <day>) returns the specified date in the datetime format
- WEEKDAY(<date>, <return_type>) returns 1-7 corresponding to the day of the week of a date (return_type indicates week start and end (1: Sunday-Saturday, 2: Monday-Sunday))

EXAMPLES

- Return the day of week of each deal
week_day = WEEKDAY('sales_data'[date], 2)