POWER BI CHEATSHEET

YOUR ESSENTIAL GUIDE

QUICK REFERENCE & FORMULAS

Power BI Cheat Sheet

Table of Contents

ADDITION (+)
SUBTRACTION (-)
MULTIPLICATION (*)
DIVISION (/)
EXPONENTIATION (^)
CONCATENATION (&)
EQUAL TO (=)
NOT EQUAL TO (<>)
GREATER THAN (>)
LESS THAN (<)
GREATER THAN OR EQUAL (>=)
LESS THAN OR EQUAL (<=)
LOGICAL AND (&&)
LOGICAL OR (||)
LOGICAL NOT (NOT)
INCLUSION (IN)
PARENTHESIS (())
TABLE CONSTRUCTOR ({})
EQUALITY FOR RELATIONSHIPS (=)

3. **Data Interaction**
   POWER BI WORKFLOWS
   CONNECT TO DATA
   DATA TRANSFORMATION
   PUBLISH REPORTS
   MANAGE DATA SOURCES

4. **Data Modeling**
   VIEW MODEL LAYOUT
   CREATE RELATIONSHIPS
   AUTODETECT RELATIONSHIPS
   MARK A TABLE AS A DATE TABLE
   CREATE DAX MEASURES
   CREATE DAX CALCULATED COLUMNS
   HIERARCHIES IN DIMENSION TABLES
   MANAGE CARDINALITY
   FLATTEN HIERARCHIES
   PERFORMANCE OPTIMIZATION
   AGGREGATION COLUMNS
   BIDIRECTIONAL CROSS-FILTERING
   CREATE QUICK MEASURES

CONCATENATE COLUMNS
CIRCULAR RELATIONSHIP DETECTION
USE AGGREGATION MANAGER

5. **Power BI Visuals and Analytics**

ADD VISUALS
TOOLTIPS
CONDITIONAL FORMATTING
ADD SLICER
SORTING DATA
FILTERS
BACKGROUND AND BORDERS
DRILLTHROUGH
BOOKMARKS
BUTTONS
ALIGN AND DISTRIBUTE VISUALS
HIERARCHY
ADD ALT TEXT
KEY PERFORMANCE INDICATORS (KPIS)
VISUALIZATION MARKETPLACE
CLUSTERING
TOP N ANALYSIS
HISTOGRAMS AND BELL CURVES
ANALYZE FEATURE
AI INSIGHTS
KEY INFLUENCERS VISUAL
DECOMPOSITION TREE
Q&A VISUAL
STATISTICAL SUMMARY
ADVANCED ANALYTICS VISUALS
TIME SERIES ANALYSIS
SLICERS
CUSTOM BIN GROUPS
QUICK INSIGHTS

6. **Transform Data in Power BI**

PROMOTE HEADERS
RENAME QUERIES
RENAME COLUMNS
REPLACE VALUES
REMOVE ROWS

REMOVE BLANK ROWS
REMOVE COLUMNS
REMOVE DUPLICATES
PIVOT COLUMNS
UNPIVOT COLUMNS
SPLIT COLUMNS
COMBINE COLUMNS
SORT COLUMNS
GROUP BY
MERGE QUERIES
DUPLICATE COLUMNS
TRANSPOSE DATA
FILL DOWN/UP
CHANGE COLUMN DATA TYPE
FIND ANOMALIES
MODIFY M CODE
ADD CONDITIONAL COLUMNS
COMBINE FILES

7. **Workspaces and Security**
   CREATE A WORKSPACE
   ASSIGN WORKSPACE ROLES
   DEPLOYMENT PIPELINES
   LINEAGE VIEW
   USAGE METRICS
   SENSITIVITY LABELS
   SCHEDULED REFRESH
   PROMOTE AND CERTIFY DATASETS
   IMPLEMENT ROW-LEVEL SECURITY (RLS)
   TEST RLS ROLES
   GATEWAYS FOR ON-PREMISES DATA
   PARAMETERS FOR DYNAMIC REPORTS
   WHAT-IF PARAMETERS
   MANAGE SEMANTIC MODELS
   CREATE DYNAMIC MEASURES

1. DAX Functions

CALCULATE

```
CALCULATE(Expression, Filters)
```

Modifies the filter context of an expression, enabling advanced calculations like conditional totals or time intelligence analysis.

SUM

```
SUM(Table[Column])
```

Adds all numerical values in a column, commonly used in measures.

AVERAGE

```
AVERAGE(Table[Column])
```

Calculates the average of a column's numerical values.

TOTALYTD

```
TOTALYTD(Table[Column])
```

Calculates the Year-To-Date total for an expression.

LASTDATE

```
LASTDATE(Dates[Column])
```

Returns the last date in a given date column, often used in semi-additive measures.

PATH

```
PATH(Table[Child_Column], Table[Parent_Column])
```

Creates a string that shows the hierarchical path from a parent to a child.

USERELATIONS HIP

```
USERELATIONSHIP(Table1[Column1], Table2[Column2])
```

Activates an inactive relationship between two tables for a specific calculation.

CALENDAR

```
CALENDAR(START_DATE, END_DATE)
```

Generates a continuous range of dates between two specified dates.

CALENDARAUTO

```
CALENDARAUTO()
```

Automatically creates a date table based on the minimum and maximum values of date columns in the model.

RELATED

```
RELATED(Table[Column])
```

Retrieves a related value from another table using an existing relationship.

CONCATENATE

```
CONCATENATE(Value1, Value2)
```

Combines two values into a single text string.

DIVIDE

```
DIVIDE(Numerator, Denominator, AlternateResult)
```

Performs division while handling divide-by-zero errors gracefully by returning an alternate result.

IF

```
IF(Condition, TrueResult, FalseResult)
```

Evaluates a condition and returns different results based on whether the condition is true or false.

DISTINCTCOUNT

```
DISTINCTCOUNT(Table[Column])
```

Counts the number of unique values in a column.

RANKX

```
RANKX(Table, Expression, Value, Order, Ties)
```

Returns the rank of a value in a table based on an expression, with options for handling ties.

SWITCH

```
SWITCH(Expression, Value1, Result1, [Value2, Result2], ..., [ElseResult])
```

Evaluates an expression and returns a matching result for the first case.

FORMAT

```
FORMAT(Value, FormatString)
```

Formats a value as a string using a specified format (e.g., currency, percentage).

VALUES

```
VALUES(Table[Column])
```

Returns a single-column table with unique values from the specified column.

EARLIER

```
EARLIER(Column, Offset)
```

Refers to a row context in an earlier iteration of the same calculation.

ALLEXCEPT

```
ALLEXCEPT(Table, Column1, Column2, ...)
```

Removes all filters except those applied to the specified columns.

FILTER

```
FILTER(Table, Condition)
```

Returns a table that contains only rows matching a specified condition.

ALL

```
ALL(Table[Column])
```

Removes all filters from a table or column, returning all rows.

HASONEVALUE

```
HASONEVALUE(Table[Column])
```

Returns `TRUE` if the column contains only one distinct value in the current filter context.

MAX

```
MAX(Table[Column])
```

Returns the largest numeric value in a column.

MIN

```
MIN(Table[Column])
```

Returns the smallest numeric value in a column.

COUNTROWS

```
COUNTROWS(Table)
```

Counts the number of rows in a table.

SUMMARIZE

```
SUMMARIZE(Table, GroupByColumnName, [Name, Expression], ...)
```

Groups data by specified columns and calculates aggregated values.

LOOKUPVALUE

```
LOOKUPVALUE(Result_Column, Search_Column, Search_Value,
[Search_Column2, Search_Value2])
```

Returns the value of a result column based on search criteria.

ISBLANK

```
ISBLANK(Value)
```

Returns `TRUE` if the specified value is blank.

ROUND

```
ROUND(Number, NumDigits)
```

Rounds a number to the specified number of digits.

2.DAX Operators

Addition (+)

```
Sales[Amount] + Sales[Tax]
```

Adds two numerical values or columns.

Subtraction (-)

```
Sales[Amount] - Sales[Discount]
```

Subtracts one numerical value or column from another.

Multiplication (*)

```
Sales[Price] * Sales[Quantity]
```

Multiplies two numerical values or columns.

Division (/)

```
Sales[Total] / Sales[Units]
```

Divides one numerical value or column by another.

Exponentiation (^)

```
Value ^ 2
```

Raises a number to the power of another number.

Concatenation (&)

```
Customer[FirstName] & " " & Customer[LastName]
```

Combines two text strings into one.

Equal To (=)

```
Sales[Category] = "Electronics"
```

Compares two values for equality.

Not Equal To (<>)

```
Sales[Category] <> "Electronics"
```

Compares two values for inequality.

Greater Than (>)

```
Sales[Price] > 100
```

Checks if one value is greater than another.

Less Than (<)

```
Sales[Price] < 100
```

Checks if one value is less than another.

Greater Than or Equal (>=)

```
Sales[Price] >= 100
```

Checks if one value is greater than or equal to another.

Less Than or Equal (<=)

```
Sales[Price] <= 100
```

Checks if one value is less than or equal to another.

Logical AND (&&)

```
(Sales[Price] > 100) && (Sales[Units] > 10)
```

Returns `TRUE` if both conditions are true, otherwise `FALSE`.

Logical OR (||)

```
(Sales[Price] > 10) || (Sales[Units] > 10)
```

Returns `TRUE` if at least one condition is true, otherwise `FALSE`.

Logical NOT (NOT)

```
NOT(Sales[Category] = "Electronics")
```

Reverses the logical value of an expression (`TRUE` to `FALSE` and vice versa).

Inclusion (IN)

```
Sales[Category] IN {"ELECTRONICS","BOOKS"}
```

Checks if a value exists in a specified list of values and returns `TRUE` or `FALSE`.

Parenthesis (())

```
(Sales[Price] + Sales[Tax]) * Sales[Units]
```

Groups expressions or specifies the order of operations in calculations.

Table Constructor ({})

```
{1, 2, 3}
```

Creates a table with a single column containing the listed values.

Equality for Relationships (=)

```
Customer[ID] = Sales[CustomerID]
```

Creates relationships between tables based on key columns.

3. Data Interaction

Power BI Workflows

```
> Connect to data
> Transform and model data
> Create visualizations
> Publish and share
```

Workflow includes importing data from sources like Excel or CSV, transforming data in Power Query Editor, building reports, and sharing insights via Power BI Service.

Connect to Data

```
> Home
> Get data
> Select File Type (e.g., CSV, Excel)
> Open File
> Load or Transform Data
```

Easily connect to various data sources like Excel, CSV, XML, or databases, and load them into Power BI for further processing.

Data Transformation

```
> Home
> Transform data
> Use Power Query Editor
```

Clean and shape your data, such as renaming columns, filtering rows, and changing data types, to prepare it for analysis.

Publish Reports

```
> File
> Publish
> Power BI Service
```

Share your reports with others by publishing them to Power BI Service, where dashboards and access can be managed.

Manage Data Sources

```
> Transform Data
> Data Source Settings
>Change Source
```

Update data source paths or settings to maintain the accuracy of your reports when file locations change.

4. Data Modeling

View Model Layout

```
> Home Tab
> Model view
> View Diagram
```

Allows managing table relationships, creating measures, and organizing data for effective data modeling.

Create Relationships

```
> Modeling Tab
> Manage Relationships
> New
> Choose Columns
> Define Cardinality
```

Establish connections between tables using key columns, defining cardinality (e.g., many-to-one, oneto-one).

Autodetect Relationships

```
> Modeling Tab
> Manage Relationships
> Autodetect
```

Automatically identifies and creates relationships between tables based on column names and data types.

Mark a Table as a Date Table

```
> Data Pane
> Right-click Table
> Mark as Date Table
> Select Date Column
```

Assigns a table as the primary date table, ensuring accurate time-based calculations and filtering.

Create DAX Measures

```
> Data Pane
> Right-click
> New Measure
```

Use DAX to calculate values like sums, averages, or percentages, enabling dynamic and reusable calculations.

Create DAX Calculated Columns

```
> Data Pane
> Right-click
> New Column
> Enter DAX Formula
```

Add new columns derived from existing ones, materialized into the dataset, increasing file size.

Hierarchies in Dimension Tables

```
> Data Pane
> Right-click
> New Hierarchy
```

Organize columns (e.g., Year > Month > Day) into a hierarchy for drill-down capabilities in visualizations.

Manage Cardinality

```
> Modeling Tab
> Manage Relationships
> New
> Define Cardinality (e.g., Many-to-One, Oneto-Many)
```

Adjusts how tables relate to each other (e.g., many-to-many for flexible connections).

Flatten Hierarchies

```
> Model Tab
> View Diagram
> Select Flattened Table Option
```

Breaks down hierarchical relationships into a single-level table for simpler analysis.

Performance Optimization

```
> View Tab
> Performance Analyzer
```

Analyzes report performance, identifying areas for improvement like visuals or DAX queries.

Aggregation Columns

```
> Power Query Editor
> Group By
> Add Aggregation
```

Pre-aggregate data by grouping and summarizing at desired levels of detail.

Bidirectional Cross-Filtering

```
> Manage Relationships
> Enable Bi-Directional Filtering
```

```
```

Allows filters to flow both ways in relationships, ensuring comprehensive filtering.

Enable Auto Date/Time

```
> File
> Options
> Data Load
> Auto Date/Time for New Files
```

Automatically generates date hierarchies for date columns, simplifying time-based analysis.

Create Quick Measures

```
> Data Pane
> Right-click
> New Quick Measure
```

Generate commonly used calculations like totals or averages without writing DAX.

Concatenate Columns

```
> Power Query Editor
> Add Column
> Custom Column
> Define Concatenation Formula
```

Combine multiple columns into a single column (e.g., concatenating Year and Month to create "MonthYear").

Circular Relationship Detection

```
> Model Tab
> Analyze Relationships
> Resolve Circular References
```

Identifies and resolves circular dependencies in relationships to avoid calculation errors.

Use Aggregation Manager

```
> Data Pane
```

```
> Right-click Table
> Manage Aggregations
```

Defines pre-aggregations for tables, improving performance when querying large datasets.
Note Diagram view is only available in Power Query Online.

5. Power BI Visuals and Analytics

Add Visuals

```
> Visualizations Pane
> Select Visual Icon (e.g., Table, Chart)
```

Allows adding visuals such as tables, bar charts, line charts, etc., to represent data insights effectively.

Tooltips

```
> Format Pane
> Tooltip Section
> Configure Custom Tooltip
```

Adds customized hover-over descriptions for enhanced data context in visuals.

Conditional Formatting

```
> Format Pane
> Conditional Formatting Options
```

Specifies cell colors, data bars, KPI icons, or web links based on field values.

Add Slicer

```
> Visualizations Pane
> Slicer Icon
> Drag Fields to Slicer Visualization
```

Adds a slicer to filter data interactively by specific criteria (e.g., year or region).

Sorting Data

```
> More Options (Three Dots)
> Sort Ascending/Descending or By Field
```

Organizes data logically, highlighting the most relevant information without removing any.

Filters

```
> Drag Fields to Filter Pane
> Configure Filters
```

Removes unnecessary data, enabling focus on relevant information in reports.

Background and Borders

```
> Format Pane
> Background/Border Sections
> Configure Color or Image
```

Adds visual elements like colors or borders to highlight and isolate specific visuals on the canvas.

Drillthrough

```
> Add Drillthrough Fields
> Configure Target Page
```

Allows users to navigate to detailed pages for in-depth analysis by clicking on a specific field or value.

Bookmarks

```
> View Tab
> Bookmarks
> Add Bookmark
```

Saves the current view of a report page for quick access, enhancing navigation and storytelling.

Buttons

```
> Insert Tab
> Buttons
> Add Button
> Configure Action (e.g., Page Navigation)
```

Adds interactive buttons for navigation or specific actions in a report.

Align and Distribute Visuals

```
> CTRL + Click Visuals
> Format Tab
> Align/Distribute Options
```

Aligns and evenly distributes visuals on the canvas for a clean, professional layout.

Hierarchy

```
> Data Pane
> Drag Fields to Create Hierarchy
```

Groups data into hierarchical levels (e.g., Year > Month > Day) for drill-down capabilities.

Add Alt Text

```
> Format Pane
> General Section
> Alt Text
> Enter Description
```

Ensures accessibility by providing descriptions for visuals that screen readers can interpret.

Key Performance Indicators (KPIs)

```
> Visualizations Pane
```

```
> KPI Icon
> Add Value, Goal, and Time Frame
```

Tracks performance against a target using metrics, goals, and timelines (e.g., total sales vs. sales target).

Clustering

```
> Scatter Chart
> More Options
> Automatically Find Clusters
```

Analyzes and groups similar data points in a scatter chart based on attribute values.

Top N Analysis

```
> Filters Pane
> Field
> Filter Type
> Top N
```

Displays the top N records based on a selected value (e.g., Top 10 selling products).

Histograms and Bell Curves

```
Use Column Charts for Histograms;
Use Area Charts for Bell Curves
```

Represents statistical data distributions for insights into data patterns.

Analyze Feature

```
> Right-click Visual Data Point
> Analyze
> Choose Option (Explain Increase or Distribution Differences)
```

Provides AI-generated insights into why data has changed or it distribution differences.

AI Insights

```
> Power Query Editor
```

```
> Add Column Tab
> Select Text Analytics, Vision, or Azure Machine Learning
```

Applies pretrained machine learning models for tasks like sentiment analysis, image processing, or anomaly detection.

Key Influencers Visual

```
> Visualizations Pane
> Key Influencers Icon
> Add Metric to Analyze and Dimensions to Explain By
```

Identifies and ranks factors that influence a specific metric, aiding in root cause analysis.

Decomposition Tree

```
> Visualizations Pane
> Decomposition Tree Icon
> Add Fields to Analyze and Explain
```

Allows data exploration across multiple dimensions, providing insights into high and low values in hierarchical data.

Q&A Visual

```
> Double-Click Canvas
> Enter Natural Language Question
```

Uses natural language processing to generate visual answers to datarelated questions.

Statistical Summary

```
> Visualizations Pane
> Add Summary Visual
```

Provides quick descriptive statistics like averages, distributions, and clusters for high-level insights.

Advanced Analytics Visuals

```
> Visualizations Pane
```

```
> Get More Visuals
> Select Advanced Analytics Category
```

Imports specialized visuals from Microsoft AppSource for complex analytical needs.

Time Series Analysis

```
Use Line Charts, Gantt Charts, or Area Charts
```

Tracks and visualizes data trends over time, useful for identifying disruptions or seasonal patterns.

Slicers

```
> Visualizations Pane
> Slicer Icon
> Add Field to Slicer
```

Filters data interactively by categories such as time or geography, enabling segmentation of data.

Custom Bin Groups

```
> Data Pane
> Right-click Field
> New Group
> Set Bin Size
```

Groups continuous data (e.g., numerical values or dates) into equal intervals for better analysis.

Quick Insights

```
> Power BI Web Service
> Report
> More Options
> Quick Insights
```

Automatically generates insights using machine learning algorithms, ideal for initial dashboard exploration.

6. Transform Data in Power BI

Promote Headers

```
> Home
> Use First Row as Headers
```

Converts the first row of data into column headers.

Rename Queries

```
> Queries Pane
> Right-click on Query
> Rename
```

Updates query names to make them meaningful and organized.

Rename Columns

```
> Right-click on column
> Rename OR Double-click column header
> Enter new name
```

Updates column names for clarity and organization of the dataset.

Replace Values

```
> Transform Tab
> Replace Values
> Enter Value to Find and Replace
> Close & Apply
```

Substitutes specific values or nulls with new ones to resolve inconsistencies or make values user-friendly.

Remove Rows

```
> Select rows
> Home
> Remove Rows
> Remove Top Rows
```

Deletes unnecessary rows to clean the dataset and improve analysis accuracy.

Remove Columns

```
> Select columns
> Home
> Remove Columns OR Remove Other Columns
```

Deletes unwanted columns or retains only necessary ones.

Remove Duplicates

```
> Right-click Column Header
> Remove Duplicates
```

Eliminates duplicate values to ensure accuracy and uniqueness in data.

Pivot Columns

```
> Transform
> Pivot Column
> Select Value Column
> Choose Aggregate Function
```

Summarizes data by converting rows into columns using aggregate functions like `SUM`, `COUNT`, or `AVERAGE`.

Unpivot Columns

```
> Select columns
> Transform
> Unpivot Columns
```

Converts column data into rows, enabling easier analysis of wide datasets.

Split Columns

```
> Home
> Split Column
> By Delimiter
```

Divides a column into two or more based on a specified delimiter (e.g., comma, space).

Combine Columns

```
> Add Column
> Custom Column
```

```
> Concatenate values with delimiter
```

Merges multiple columns into one, improving readability or preparing data for analysis.

Sort Columns

```
> Home
> Sort Ascending/Descending
> Choose column
```

Reorders data within a column alphabetically, numerically, or by other criteria.

Group By

```
> Transform
> Group By
> Select column(s)
> Define operation (SUM, COUNT, etc.)
```

Aggregates data based on selected columns to perform calculations like sums or counts.

Merge Queries

```
> Home
> Merge Queries
> Choose Tables and Columns
> Select Join Type
```

Combines data from multiple queries into one using a join operation (e.g., INNER JOIN, OUTER JOIN).

Duplicate Columns

```
> Right-click column
> Duplicate Column
```

Creates a copy of a column for further transformations without altering the original.

Transpose Data

```
> Transform
```

```
> Transpose
```

Switches rows to columns or columns to rows for reformatting data.

Fill Down/Up

```
> Transform
> Fill
> Fill Down or Fill Up
```

Fills blank cells in a column with values from the cell above or below.

Combine Files

```
> Home
> Combine Files
> Select Folder
```

Consolidates data from multiple files (e.g., Excel or CSV) into one query.

Change Column Data Type

```
> Select Column
> Transform Tab
> Data Type
> Choose Correct Data Type
```

Fixes data type issues by selecting the correct type for calculations and transformations.

Find Anomalies

```
> View Tab
> Data Preview
> Check Column Distribution, Quality, and Profile
```

Identifies irregularities or quality issues in data through visual summaries like column statistics and value distributions.

Modify M Code

```
> View Tab
> Advanced Editor
> Edit Code
```

```
> Click Done
```

Edits the underlying M code for advanced or customized transformations.

Add Conditional Columns

```
> Home
> Add Column
> Conditional Column
> Define conditions and values
```

Adds a new column based on defined conditions (e.g., categorizing data into ranges).

7. Workspaces and Security

Create a Workspace

```
> Power BI Service
> Workspaces
> Create a Workspace
```

Enables you to organize and collaborate on dashboards, reports, and datasets.

Assign Workspace Roles

```
> Workspace
> Access
> Add Email or Group
> Assign Role (Admin, Member, Contributor, Viewer)
```

Defines user permissions for collaboration and content management within the workspace.

Deployment Pipelines

```
> Power BI Service
> Deployment Pipelines
> Create Pipeline
> Configure Workspace
```

Manages content migration between development, testing, and production environments (Premium accounts only).

Lineage View

```
> Workspace
> View Drop-Down
> Lineage
```

Visualizes relationships between workspace artifacts (reports, datasets) and external dependencies.

Usage Metrics

```
> Workspace
> Report
> More Options
> View Usage Metrics
```

Tracks performance and user interaction metrics for reports and dashboards.

Sensitivity Labels

```
> Power BI Desktop
> Apply Sensitivity Labels
> Publish
```

Protects sensitive data by specifying export permissions.

Scheduled Refresh

```
> Dataset
> Settings
> Scheduled Refresh
```

Automates data updates to ensure reports and dashboards display the latest information.

Promote and Certify Datasets

```
> Power BI Service
> Dataset
> Promote or Certify
```

Endorses high-quality datasets for organizational use, ensuring reliability and consistency.

Test RLS Roles

```
> Power BI Desktop
> Modeling Tab
> View as Roles
```

Simulates role-specific views to verify correct implementation of row-level security.

Gateways for On-Premises Data

```
> Install Power BI Gateway
> Configure Gateway in Power BI Service
```

Connects on-premises data sources to Power BI cloud services, enabling seamless data access and refresh.

Parameters for Dynamic Report

```
> Power Query Editor
> Manage Parameters
> Create New Parameter
> Replace Filter with Parameter
```

Enables dynamic filtering of reports based on user input or predefined values.

What-If Parameters

```
> Modeling Tab
> New Parameter
> Define Parameter
> Create Measure
```

Runs scenario analysis by dynamically changing parameter values (e.g., forecasting sales impact with variable discounts).

Manage Semantic Models

```
> Power BI Desktop
> Create Relationships
> Define Star Schema
```

Organizes data into fact and dimension tables for optimized performance and analysis.

Create Dynamic Measures

```
DAX: Measure = (Data[Field]) * Parameter[Value]
```

Dynamically changes calculations in reports based on input parameters.