Introduction of POWER BI

Power BI helps you turn raw data into interactive reports and dashboards.

Key Components of Power BI:

1. **Power BI Desktop –** A free application for building reports on your PC.
2. **Power BI Service –** An online SaaS (cloud) platform for sharing and collaborating on reports.
3. **Power BI Mobile App –** For viewing reports and dashboards on mobile devices.
4. **Power BI Gateway –** Connects on-premise data securely to Power BI cloud.
5. **Power BI Report Builder –** For creating paginated reports (used in printing scenarios).

What You Can Do with Power BI:

- Connect to various data sources (Excel, SQL Server, Web, SharePoint, etc.)
- Clean and transform messy data with Power Query
- Create relationships between data tables
- Write formulas using DAX (Data Analysis Expressions)
- Design interactive visualizations like charts, KPIs, maps, and tables
- Publish reports to the cloud and collaborate with others
- Schedule automatic data refreshes

Why Learn Power BI?

- It's one of the most in-demand tools in data analytics and business intelligence
- Widely used across industries (Finance, Sales, Marketing, HR, etc.)
- Enables faster, smarter decision-making through data visualization

OVERVIEW OF MICROSOFT POWER BI

Cloud-based business intelligence

Power BI is a cloud-based business intelligence service that provides a single view of your most critical business data, accessible from anywhere with internet access.

Data integration and connectivity

With Power BI, you can connect to a wide range of data sources, including Excel, SQL Server, and cloud-based data services, and create interactive dashboards and reports that provide actionable insights.

Interactive dashboards and reports

Power BI allows you to create interactive, immersive dashboards and reports that provide actionable insights and drive business results.

BENEFITS OF USING POWER BI

Ease of Use

Power BI's drag-and-drop interface makes it easy for even non-technical users to create stunning visualizations and interactive reports.

Real-Time Updates

Power BI provides real-time updates, allowing you to stay on top of your data and make informed decisions.

Mobile Access

Power BI's mobile app allows you to access your data and reports from anywhere, making it easy to stay connected and make informed decisions on-the-go.

Install Power BI Desktop

How to Install Power BI Desktop (Free)

Option 1: Install from Microsoft Store (Recommended for Windows 10/11 users)

1. Open the Microsoft Store on your computer.
2. Search for "Power BI Desktop".
3. Click Install (or Get).
4. Once installed, launch Power BI Desktop from your Start menu.

Option 2: Install from the Official Website

1. Go to the official Power BI download page:

 https://powerbi.microsoft.com/desktop/

2. Click on Download Free.
3. Choose your language and click Download.
4. Select the correct version (64-bit or 32-bit) based on your system.
5. Run the downloaded .msi file and follow the installation prompts.

After Installation:

- Open Power BI Desktop.
- On first launch, you may be asked to sign in with a Microsoft account (you can skip this if you just want to explore).
- Start a new report and explore the interface (Home, Insert, Modeling tabs, Fields pane, and Visualizations pane).

3. Import Data

How to Connect to Data in Power BI Desktop

Step-by-Step: Connect to Excel or CSV

1. Open Power BI Desktop
2. Click Home > Get Data
3. Choose a data source:
    a. For Excel: click Excel
    b. For CSV: click Text/CSV
4. Browse and select your file.
5. Click Open
6. In the preview window, you'll see the tables/sheets.
    a. Select the table/sheet you want to use.
    b. Click Load to bring it directly into Power BI.
    c. Or click Transform Data to open it in Power Query Editor for cleaning.
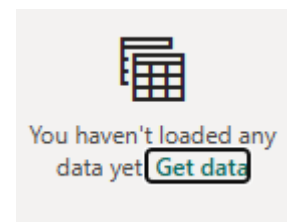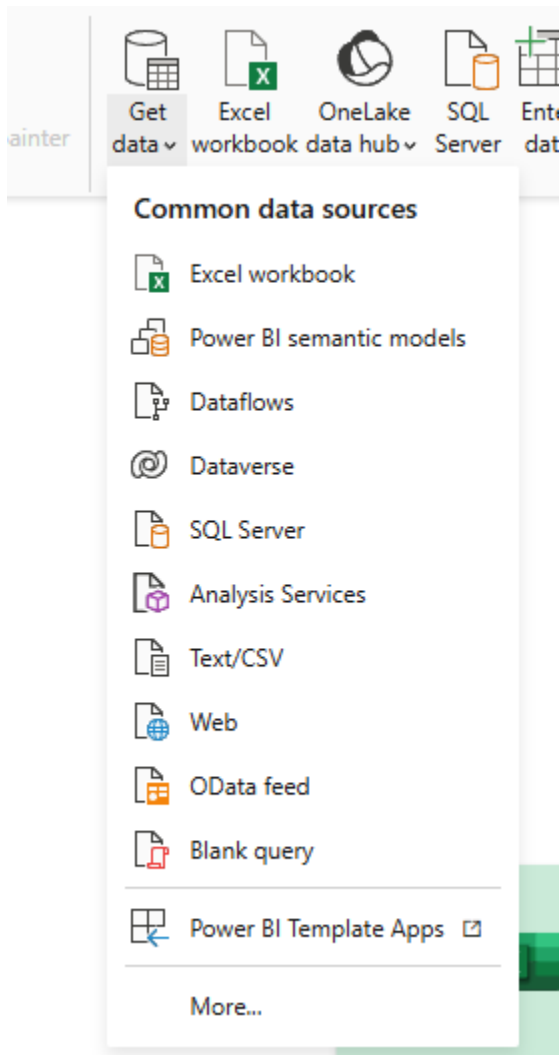
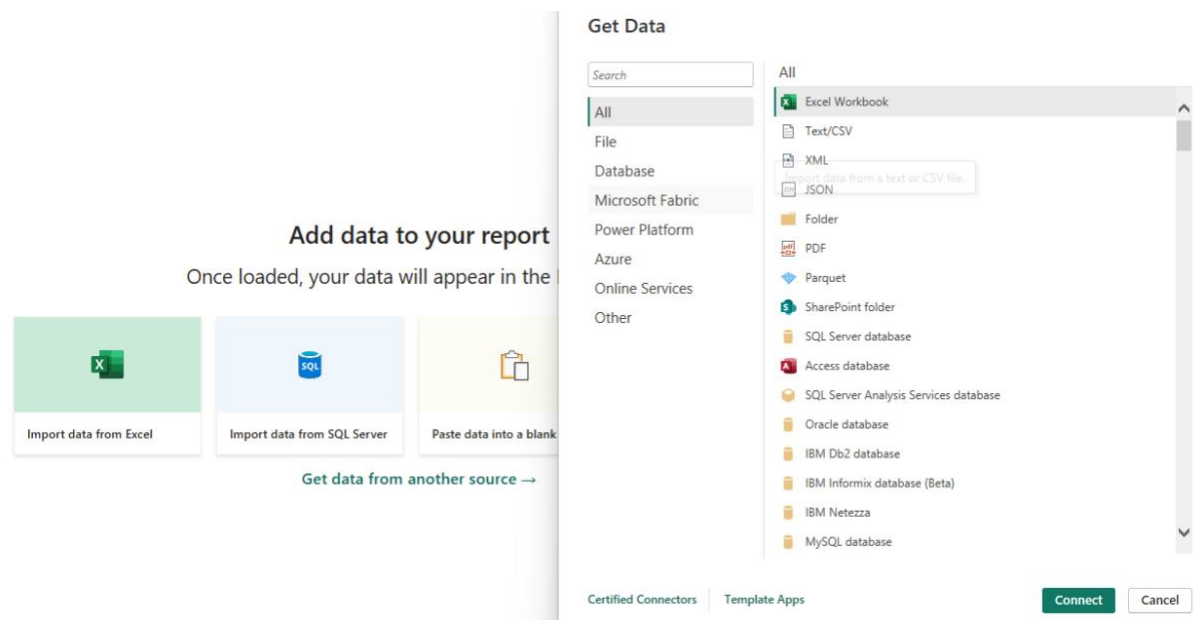Other Common Data Sources You Can Connect To:

- Excel, CSV, XML, JSON
- SQL Server, MySQL, PostgreSQL

- SharePoint Lists
- Web URLs
- Power BI datasets
- Azure Services
- Google Sheets (with connector or workaround)

🧠 Pro Tip:

If you're working with Excel, make sure your data is in table format (Insert > Table in Excel). It ensures smoother import and better structure in Power BI.

4. Data Transformation - Using Power Query (ETL Tool)

Data Transformation in Power BI (Using Power Query Editor)

Once you've connected to a data source, transforming the data ensures it's clean, structured, and ready for analysis.

Why Transform Data?

Raw data is often messy. You need to:

- Remove irrelevant columns
- Correct data types
- Filter rows
- Rename columns
- Combine datasets

All of this happens in Power Query Editor — Power BI's built-in data cleaning tool.

Common Data Transformations

Here are beginner-friendly transformations you can try:

1. Remove Unwanted Columns

- Select a column > Right-click > Remove

2. Rename Columns

- Double-click the column name or right-click > Rename

3. Change Data Type

- Select a column > Go to the top ribbon > Data Type > choose (e.g., Text, Date, Whole Number)

4. Filter Rows

- Click the dropdown on a column > select/unselect values to filter (like Excel)

5. Sort Data

- Click the dropdown on a column > Sort Ascending/Descending

6. Split Column

- Go to Transform > Split Column (e.g., split full name into first and last name)

7. Remove Duplicates

- Select the column(s) > Remove Duplicates

8. Trim or Clean Text

- Go to Transform > Format > Trim (removes leading/trailing spaces), or Clean (removes non-printable characters)
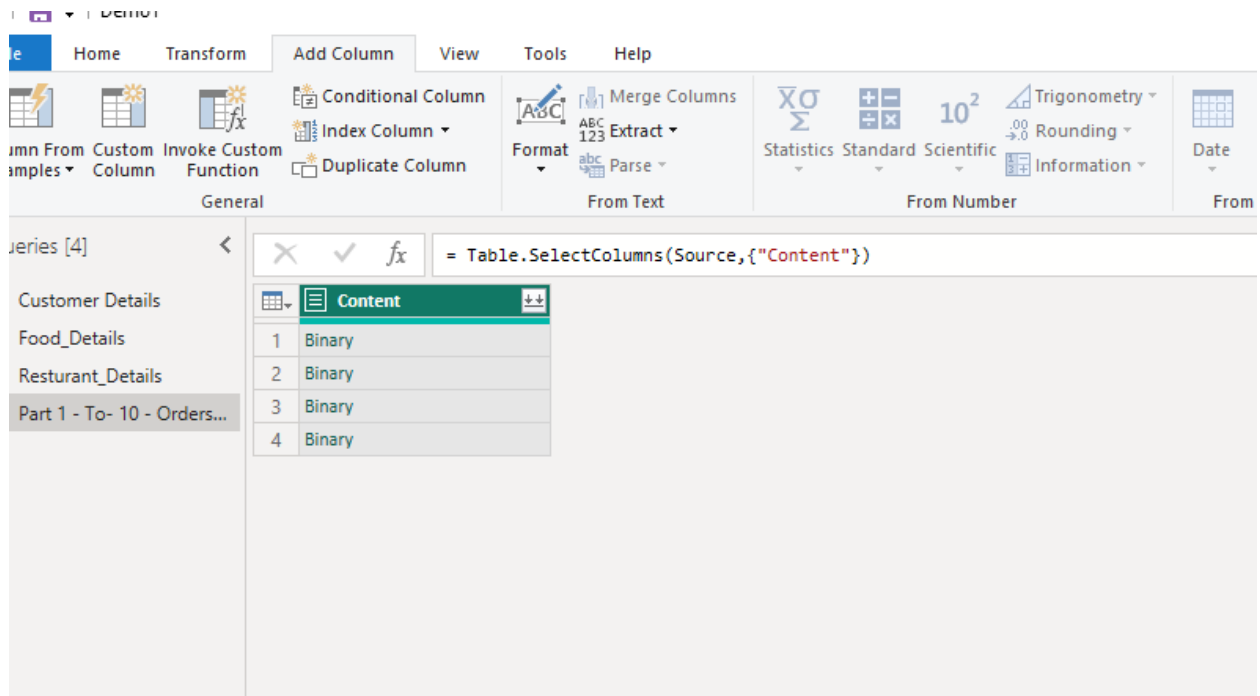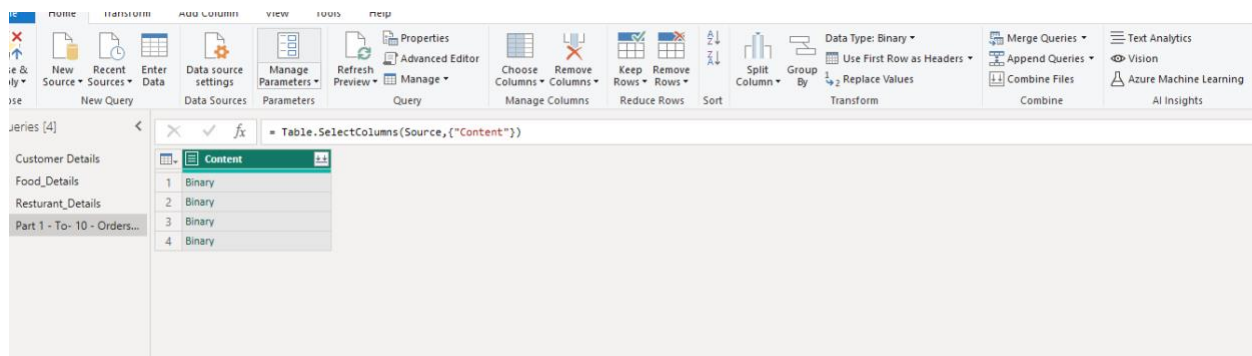
How to Get to Power Query Editor

1. After loading data: Click Home > Transform Data
2. Power Query Editor will open in a new window

All changes are recorded as steps in the "Applied Steps" pane, so you can undo or audit any transformation.
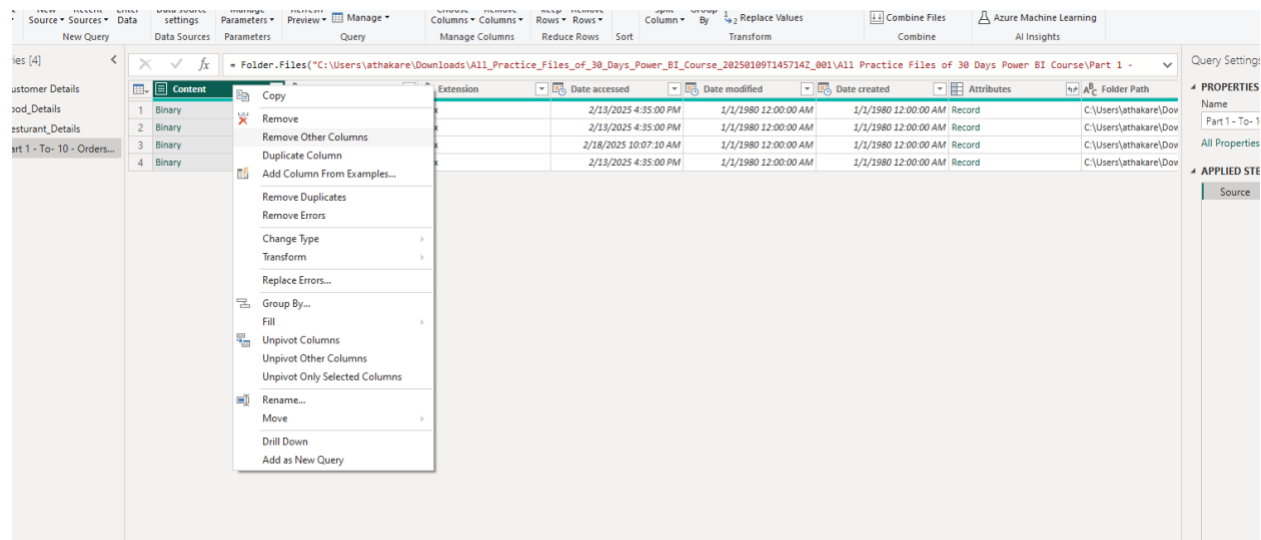
Right click on content and select remove other columns

Now go to add column -> then select custom column

Custom Column

Add a column that is computed from the other columns.

New column name

Table

Custom column formula ⓘ

= Excel.Workbook([Content])

Available columns

Content

<< Insert

Learn about Power Query formulas

✔ No syntax errors have been detected.

OK   Cancel

| le | Home | Transform | Add Column | View | Tools | Help |

Conditional Column
Index Column ▾
Duplicate Column

umn From Custom Invoke Custom
amples ▾ Column Function

General

Format

Merge Columns
Extract ▾
Parse ▾

From Text

Statistics Standard Scientific

From Number

Trigonometry ▾
Rounding ▾
Information ▾

Date Time Duration

From Date & Time

Text
Analytics

Vision Azure Machine
Learning

AI Insights

ueries [4]

= Table.AddColumn(#"Removed Other Columns", "Table", each Excel.Workbook([Content]))

Customer Details
Food_Details
Resturant_Details
Part 1 - To- 10 - Orders...

	Content		ABC
1	Binary		
2	Binary		
3	Binary		
4	Binary		

Copy
Remove
Remove Other Columns
Duplicate Column
Add Column From Examples...
Remove Duplicates
Remove Errors
Change Type ▸
Transform ▸
Replace Errors...
Group By...
Fill ▸
Unpivot Columns
Unpivot Other Columns
Unpivot Only Selected Columns
Rename...

After creating Table column just remove the content column by just right click and select remove

Here just hold the **Shift** button and select **table.name, Table.data**

And click on remove other columns

= Table.SelectColumns(#"Expanded Table",{"Table.Name", "Table.Data"})

Table.Name   Table.Data

Expand Aggregate

☑ (Select All Columns)
☑ Column1
☑ Column2
☑ Column3
☑ Column4
☑ Column5
☑ Column6
☑ Column7
☑ Column8

☑ Use original column name as prefix

⚠ List may be incomplete.   Load more

OK   Cancel

= Table.ExpandTableColumn(#"Removed Other Columns1", "Table.Data", {"Column1", "Column2", "Column3", "Column4", "Column5", "Column6", "Column7", "Column8"},

Table.Name	Table.Data.Column1	Table.Data.Column2	Table.Data.Column3	Table.Data.Column4	Table.Data.Column5	Table.Data.Column6	Table.Data.Col
1 April_Sales_2023	order_id	orderDate	customer_id	Resturant_ID	Fooditem	quantity	deliver_status
2 April_Sales_2023	256184	4/1/2023	29	212	2142	5 Delivered
3 April_Sales_2023	256185	4/1/2023	24	213	2152	7 Delivered
4 April_Sales_2023	256186	4/1/2023	28	212	2145	2 Delivered
5 April_Sales_2023	256187	4/1/2023	4	213	2149	2 Delivered
6 April_Sales_2023	256188	4/1/2023	30	211	2141	4 Cancelled
7 April_Sales_2023	256189	4/1/2023	17	212	2147	4 Delivered
8 April_Sales_2023	256190	4/1/2023	17	211	2142	4 Delivered
9 April_Sales_2023	256191	4/1/2023	15	216	2161	7 Delivered
10 April_Sales_2023	256192	4/2/2023	10	211	2141	7 Delivered
11 April_Sales_2023	256193	4/2/2023	29	212	2147	7 Delivered
12 April_Sales_2023	256194	4/2/2023	25	213	2148	4 Delivered
13 April_Sales_2023	256195	4/2/2023	3	212	2145	10 Delivered
14 April_Sales_2023	256196	4/2/2023	4	213	2150	5 Delivered
15 April_Sales_2023	256197	4/2/2023	13	211	2144	1 Delivered
16 April_Sales_2023	256198	4/2/2023	4	212	2147	9 Delivered
17 April_Sales_2023	256199	4/2/2023	25	217	2165	10 Delivered
18 April_Sales_2023	256200	4/2/2023	4	212	2145	1 Delivered
19 April_Sales_2023	256201	4/2/2023	28	211	2142	9 Delivered
20 April_Sales_2023	256202	4/2/2023	6	211	2144	2 Delivered
21 April_Sales_2023	256203	4/2/2023	9	212	2145	8 Delivered
22 April_Sales_2023	256204	4/2/2023	26	212	2145	1 Delivered
23 April_Sales_2023	256205	4/2/2023	12	211	2142	9 Delivered
24 April_Sales_2023	256206	4/2/2023	18	211	2142	7 Delivered
25 April_Sales_2023	256207	4/2/2023	30	211	2142	6 Delivered
26 April_Sales_2023	256208	4/2/2023	6	211	2142	7 Cancelled
27 April_Sales_2023	256209	4/2/2023	18	212	2147	8 Delivered
28 April_Sales_2023	256210	4/2/2023	27	216	2163	2 Delivered
29 April_Sales_2023	256211	4/2/2023	30	212	2147	6 Delivered

Query Settings

PROPERTIES
Name
Part 1 - To- 10 - Orders Data
All Properties

APPLIED STEPS
Source
Removed Other Columns
Added Custom
Removed Columns
Expanded Table
Removed Other Columns1
✕ Expanded Table.Data

= Table.ExpandTableColumn(#"Removed Other Columns1", "Table.Data", {"Column1", "Column2", "Column3", "Column4", "Column5", "Column6", "Column7", "Column8"},

Table.Name	Table.Data.Column1	Table.Data.Column2	Table.Data.Column3	Table.Data.Column4	Table.Data.Column5	Table.Data.Column6	Table.Data.Col
	● Valid 100%	● Valid 100%	● Valid 100%	● Valid 100%	● Valid 100%	● Valid 100%	● Valid
	● Error 0%	● Error 0%	● Error 0%	● Error 0%	● Error 0%	● Error 0%	● Error
	● Empty 0%	● Empty 0%	● Empty 0%	● Empty 0%	● Empty 0%	● Empty 0%	● Empty
1 April_Sales_2023	order_id	orderDate	customer_id	Resturant_ID	Fooditem	quantity	deliver_status
2 April_Sales_2023	256184	4/1/2023	29	212	2142	5 Delivered
3 April_Sales_2023	256185	4/1/2023	24	213	2152	7 Delivered
4 April_Sales_2023	256186	4/1/2023	28	212	2145	2 Delivered
5 April_Sales_2023	256187	4/1/2023	4	213	2149	2 Delivered
6 April_Sales_2023	256188	4/1/2023	30	211	2141	4 Cancelled

after we have mention the headers so, go to **home** and click on **use first Row as Headers**

We got some errors. So, to remove errors just right click on one column and all columns errors will be removed directly.
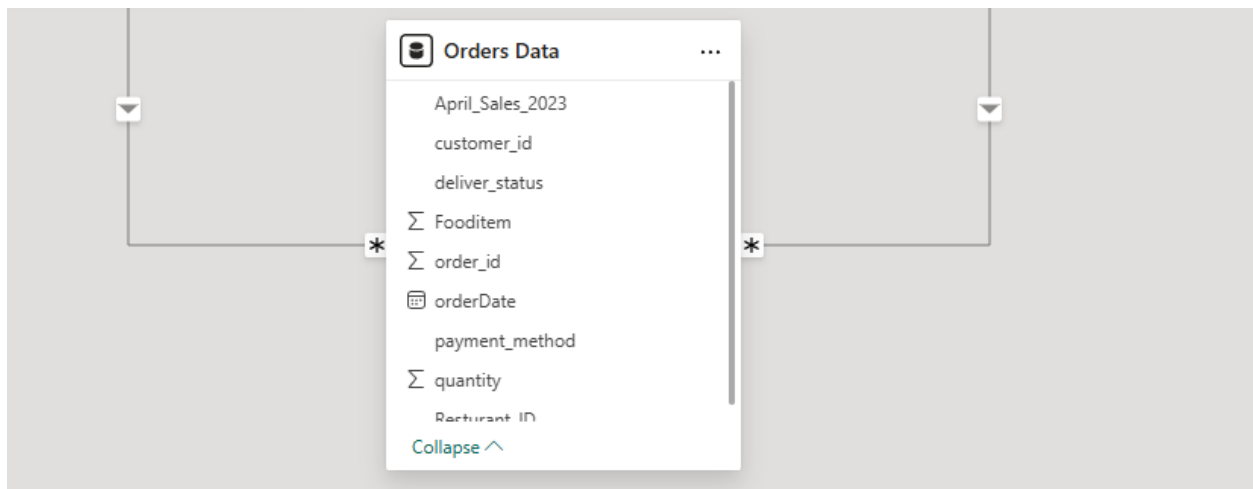

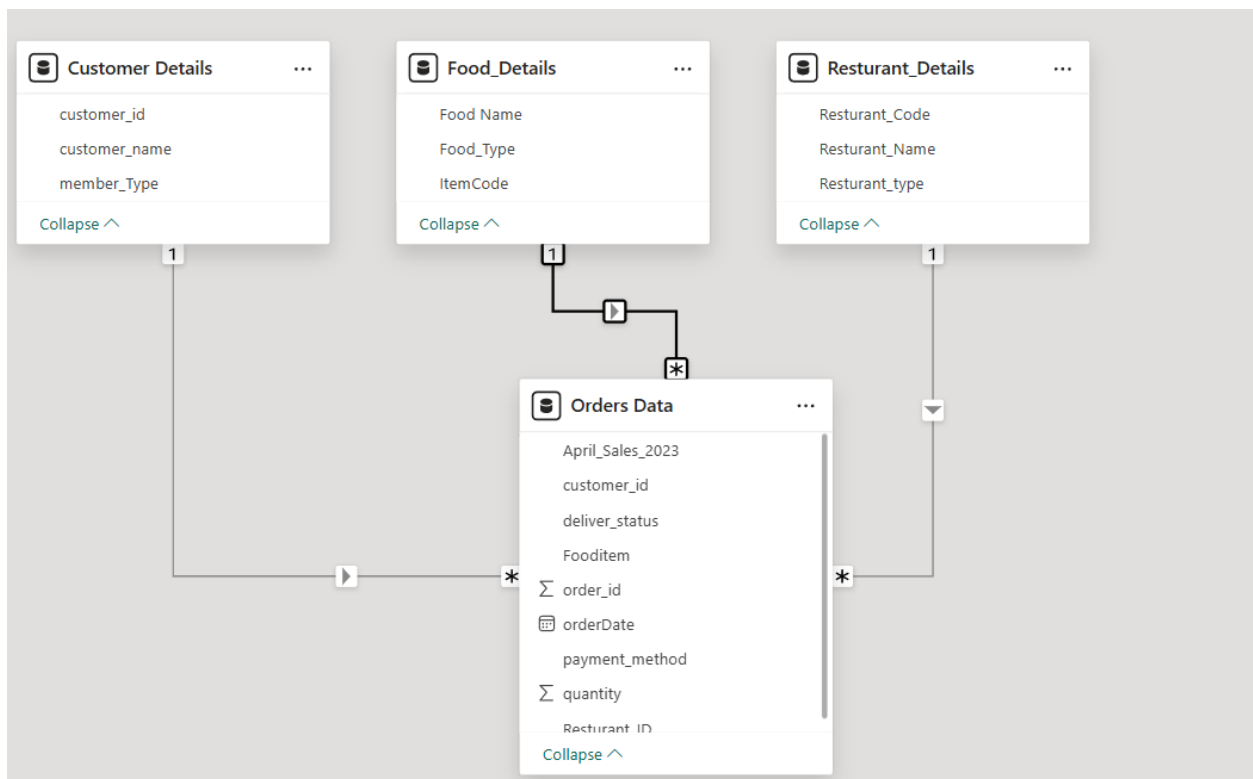# 5. Data modelling – Creating Relationship

For creating relation go to **model view**

Dimension table – unique values available

Fact Table/Data Table – Repeated Values

Relation of tables from **one to many cardinality**

6.Power Query Editor

The **Power Query Editor** is where you clean, shape, and transform your raw data before it gets loaded into your Power BI report.

How to Open Power Query Editor

- After importing data, click on **Home > Transform Data**
- This opens the **Power Query Editor** window

Main Areas of the Power Query Editor

Area	Description
Ribbon	Contains commands like Remove Columns, Filter, Group By, Split Column, etc.
Queries Pane	Shows all your loaded tables or data sources
Data Preview	Shows a preview of your data where you can make changes
Applied Steps	Shows every transformation step applied to the selected query

Key Features & Tasks You Can Perform

- **Remove, Rename, and Reorder Columns**
- **Filter Rows** (e.g., remove nulls, keep top 10)
- **Group Data** (e.g., group sales by region)
- **Merge and Append Queries** (join or stack tables)
- **Create Custom Columns** using formulas
- **Change Data Types** (text, date, number, etc.)
- **Format Data** (uppercase, trim, clean)
- **Pivot and Unpivot Columns**

Good to Know:

- Power Query uses a language called **M** under the hood, which you can see in the **Advanced Editor**.
- All changes are **non-destructive** and tracked step-by-step—you can undo or modify them anytime.

Real-Life Use Case:

Imagine you receive a messy Excel sheet with:

- Extra columns
- Inconsistent date formats
- Duplicates

With Power Query, you can:
 1) Clean it
 2) Structure it
 3) Load only what you need into Power BI

7.Load Data & Build Simple Report

Step 1: Load Transformed Data

1. After transforming your data in **Power Query Editor**, click **Home > Close & Apply**.
2. Power BI will load the cleaned data into the report view.

Step 2: Understand the Report View Layout

- **Fields Pane (Right):** Your tables and columns
- **Visualizations Pane (Right):** Choose charts and visuals

- **Canvas (Center):** Drag and drop to build reports

Step 3: Create a Simple Report (Example: Sales Data)

Assume you have a table with columns like: `Product`, `Region`, `Sales`, and `Date`.

Create a Bar Chart

1. Click on **Clustered Bar Chart** from the Visualizations pane.
2. Drag `Region` to the **Y-axis**.
3. Drag `Sales` to the **X-axis**.

Add a Card for Total Sales

1. Click on the **Card** visual.
2. Drag `Sales` to the **Fields** – it will show the total.

Add a Slicer for Product

1. Click on the **Slicer** visual.
2. Drag `Product` to it – now you can filter your report by product name.

Change Titles and Labels

- Click on any visual > go to **Format (paint roller icon)** > edit titles, colors, data labels, etc.

Save Your Report

- Click **File > Save As** and save it with a `.pbix` extension.