EXPERIMENT 1

Task :

Explore Microsoft Power BI desktop:
i) Ribbon ii) canvas iii) pages tab iv) visualization pane v) Fields pane
vi) Filters pane vii) Report view viii) Table view ix) Model view.

Microsoft Power BI :

Data Visualization: Power BI is a powerful data visualization tool that allows users to create interactive and shareable dashboards.

Integration: It integrates seamlessly with various data sources, including Excel, SQL Server, Azure, and many more, enabling users to gather data from multiple platforms.

Power Query: Power BI includes Power Query, which allows users to extract, transform, and load (ETL) data from different sources.

DAX (Data Analysis Expressions): Power BI uses DAX, a formula language, to create custom calculations and analyses within your data models.

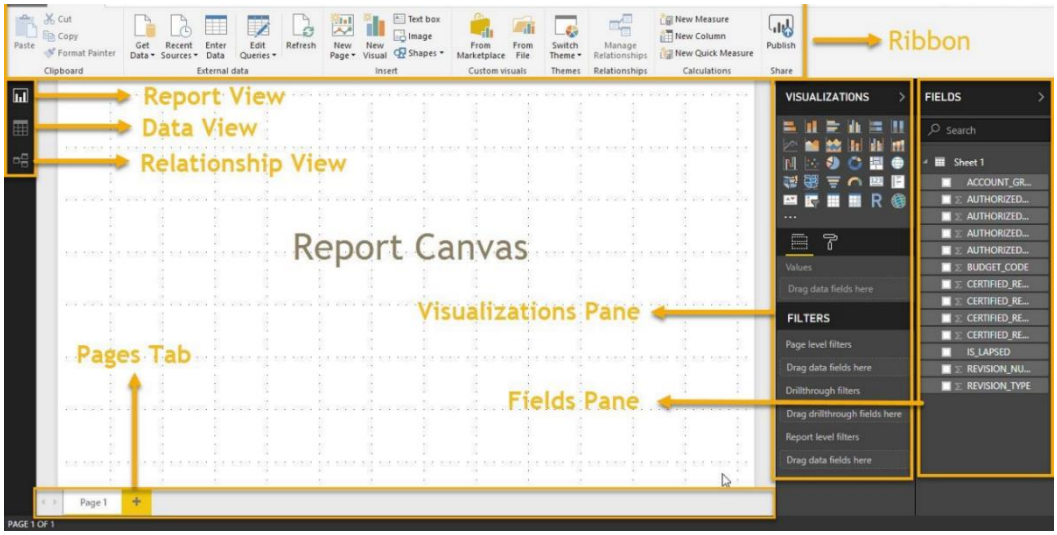
Power BI Desktop: This is a free application that can be installed on your computer, allowing you to connect to, transform, and visualize your data.

Power BI Service: This is an online SaaS (Software as a Service) where users can share and collaborate on their Power BI reports and dashboards.

AI Features: It includes AI capabilities such as natural language processing (NLP) and machine learning integrations to help users get deeper insights from their data.

Realtime Data: Power BI can handle realtime data, allowing users to monitor data as it comes in, providing uptodate insights.

Custom Visuals: Users can create and import custom visuals to enhance their reports and dashboards, offering more flexibility in how data is presented.



Power BI Desktop Interface: The Report has Five Main Areas

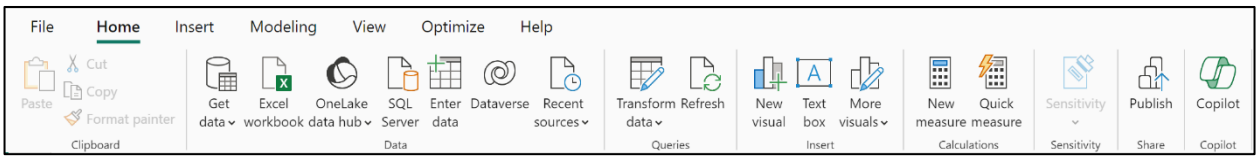
1. **Ribbon:** Displays common tasks associated with reports and visualizations.
2. **Pages**: The Pages tab area along the bottom allows you to select or add a report page.
3. **Visualizations:** The Visualizations pane allows you to:
   - Change visualizations
   - Customize colors or axes
   - Apply filters
   - Drag fields … and many more
4. **Fields:** The Fields pane allows you to:
   - Drag and drop query elements and filters onto the Report view
   - Drag to the Filters area of the Visualizations pane
5. **Views Pane**:

   There are three types of views:
   - *Reports View*: Allows you to create any number of report pages with visualizations.
   - *Data View:* Allows you to inspect, explore, and understand data in your Power BI Desktop model.
   - *Relationship or Model View*: Allows you to show all of the tables, columns, and relationships in your model.

Now, let's take a look into each of the important features in detail:

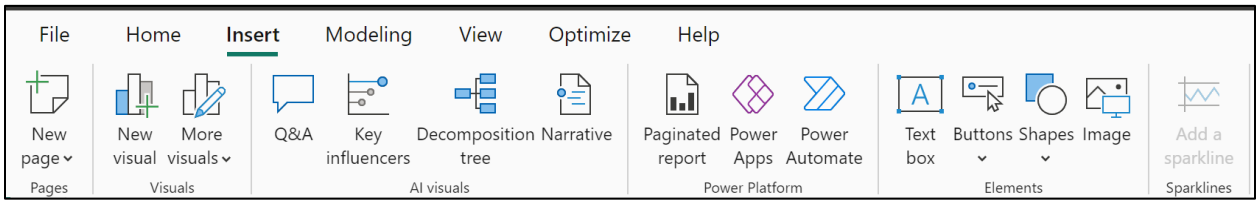
1. Ribbon:

Home Tab:



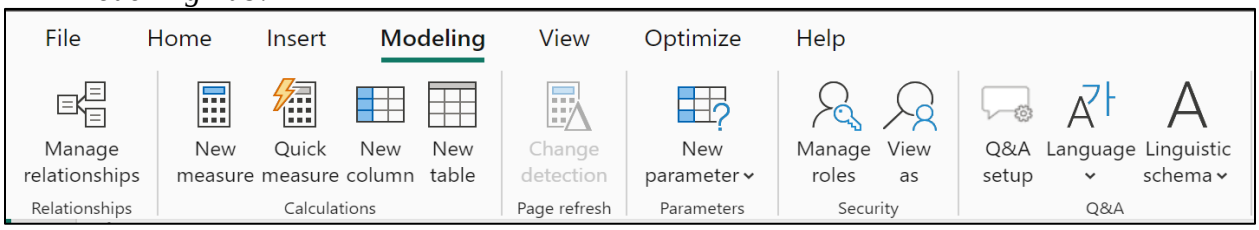
- Clipboard: Basic clipboard actions such as cut, copy, and paste.
- New Visual: Add new visualizations like charts, maps, tables, and more.
- Data: Connect to various data sources, manage data queries, and refresh data.
- Transform Data: Open Power Query Editor to clean and transform data.
- Publish: Share your report to the Power BI Service.

Insert Tab:



- Add new pages, Q&A , inserting buttons, shapes ….
- Visuals: Add different types of visuals such as charts, maps, KPIs, and custom visuals.
- Text and Images: Insert text boxes, images, shapes, and buttons to enhance the report design.
- Add visuals for advanced analytics.

Modelling Tab:

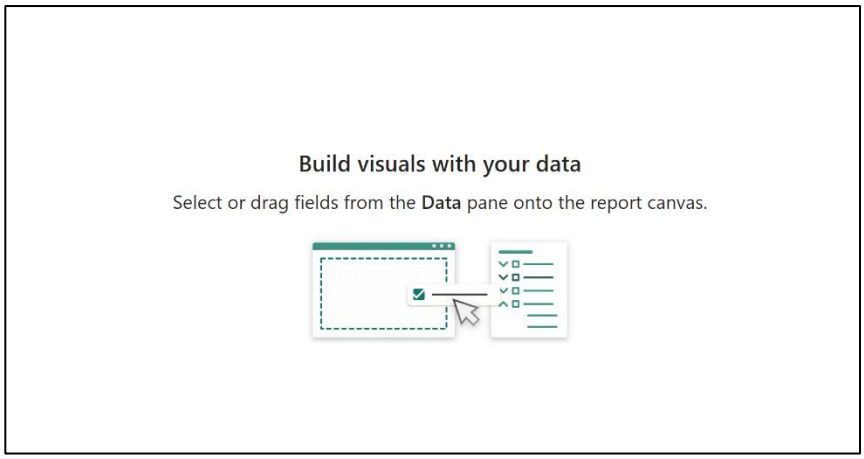


- Calculations: Create new calculated columns, measures, and quick measures using DAX (Data Analysis Expressions).
- New Table: Create new tables using DAX.
- New Measure: Create new measures from the data
- Manage Relationships: Define and manage relationships between tables.
- Security: Set up roles and manage rowlevel security.
- *Manage Relationships*: Define relationships between different tables in your data model.

View Tab:

- Page View: Toggle between different page views (Fit to Page, Fit to Width, Actual Size).
- Show: Display gridlines, snap objects to the grid, and other layout options.
- Themes: Apply different themes to your report for consistent styling.
- Bookmarks: Create and manage bookmarks for specific views or states of your report.
- Selection Pane: Manage the visibility of report elements.
- Sync Slicers: Synchronize slicers across multiple pages.

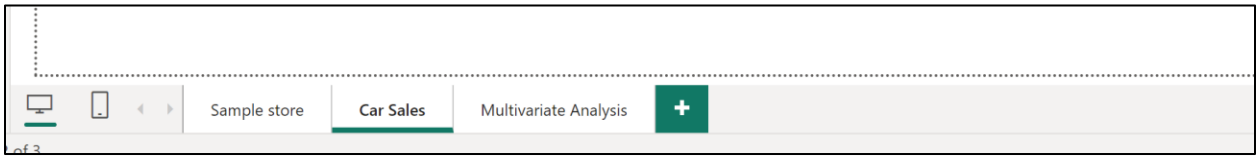
2. Canvas:



- Primary Workspace: The Canvas is the main area where you create and arrange your data visualizations.
- Adding Visuals: Drag fields from the Fields pane or use the Visualizations pane to add charts, tables, maps, and more.
- Customization: Resize, move, and format visuals to create a visually appealing layout with customized colors, labels, and titles.
- Interactivity: Configure crossfiltering, crosshighlighting, drillthrough, and drilldown to explore data interactively.
- Multiple Pages: Use the Pages tab to add, rename, and navigate between multiple report pages.

- Annotations: Add text boxes, shapes, and images to provide context and enhance visual appeal
- Tooltips: Create detailed tooltips for additional context and insights when hovering over visuals.
- Bookmarks and Selections: Save specific views and manage the visibility and layering of elements for a clean layout.
- Themes: Apply builtin or custom themes for a consistent color scheme and style across your report.
- Workflow Integration: Integrates with data connection, transformation, modeling, and publishing workflows for endtoend report creation.

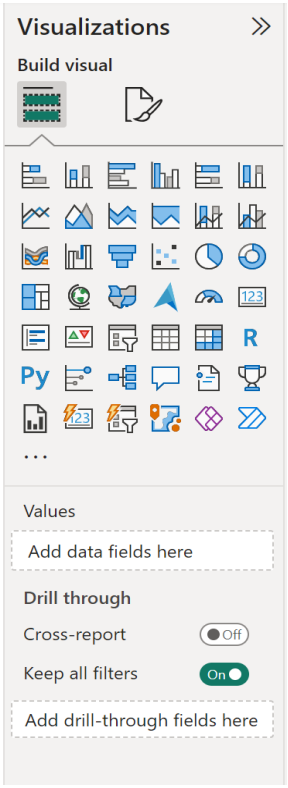
Pages Tab:

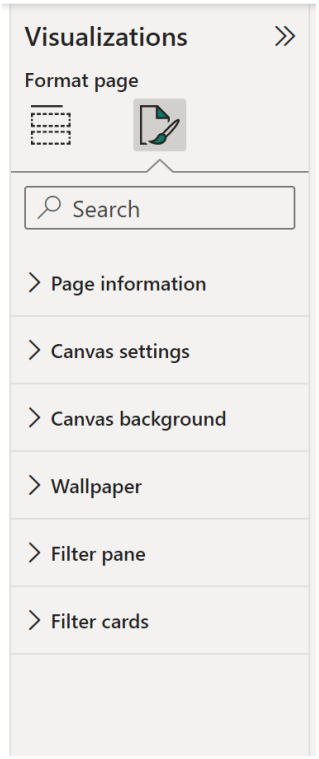


The Pages tab in Power BI Desktop is an essential feature that allows users to manage multiple report pages within a single report file. Here are the key points:

- The Pages tab is located at the bottom of the Power BI Desktop interface.
- You can add new pages to your report by clicking the "+" icon. Each page can contain different sets of visuals and data insights.
- Click on the page tabs to navigate between different report pages. This allows you to organize your report into logical sections.
- Double Click on the page tab name to rename it. Giving pages descriptive names helps in identifying the content quickly.
- Right click on a page tab and select "Duplicate" to create a copy of an existing page. This is useful for creating similar layouts with slight variations.
- Rightclick on a page tab and select "Delete" to remove a page from your report.
- Drag and drop page tabs to reorder them. This helps in arranging the flow of the report as per your requirements.
- The Pages tab in Power BI Desktop provides flexibility in organizing and presenting complex data insights across multiple sections within a single report.

Visualization Pane:





The Visualizations pane in Power BI Desktop is a critical component that allows users to customize and manage their data visualizations.

- The Visualizations pane is located on the right side of the Power BI Desktop interface.

Adding Visuals:

- Select from a variety of pre-built visualizations such as bar charts, line charts, pie charts, maps, tables, and more.
- Drag fields from the Fields pane directly onto the canvas, and the Visualizations pane will automatically suggest appropriate visual types.

Customization Options:

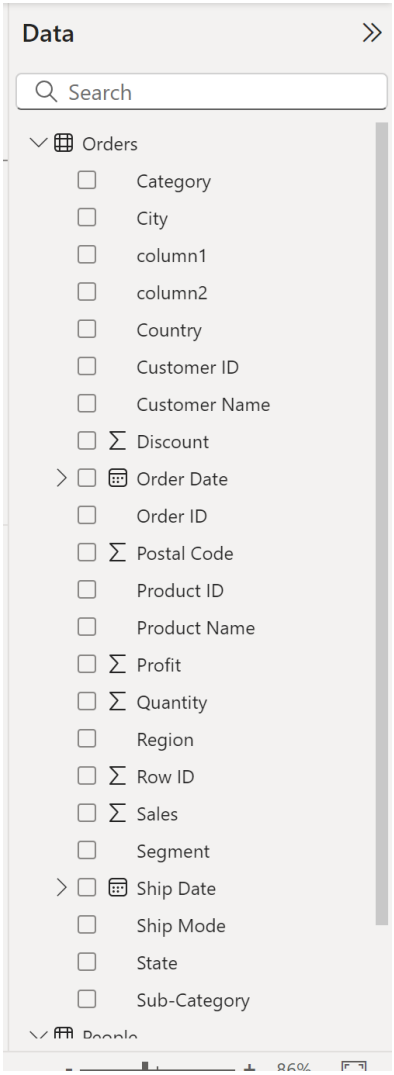
- Fields: Assign fields to different roles within the visual, such as values, axes, legends, and tooltips.
- Format: Customize the appearance of the visual, including colors, fonts, titles, labels, backgrounds, and borders.
- Analytics: Add analytical elements like trend lines, constant lines, and other statistical measures to your visuals.

Filters:

- Apply filters directly within the Visualizations pane to control which data is displayed in the visual.
- Visual-level filters: Affect only the selected visual.
- Page-level filters: Affect all visuals on the current report page.
- Report-level filters: Affect all visuals across the entire report.

The Visualizations pane is a powerful tool in Power BI Desktop that enables users to create, customize, and manage their data visualizations effectively, providing deep insights and a compelling visual representation of their data.

Fields pane



Location:
The Fields pane is located on the right side of the Power BI Desktop interface, usually below the Visualizations pane.

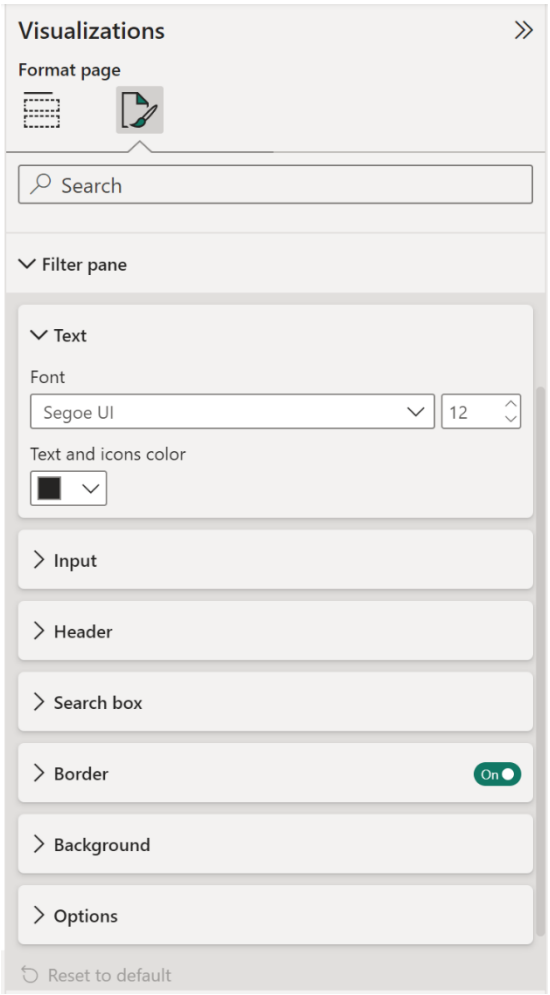
Data Sources:
Displays all tables and fields from the connected data sources.

Drag and Drop:
Fields can be dragged and dropped onto the canvas to create visuals or into the Visualizations pane to specify visual roles (e.g., axis, legend, value).

Hierarchy Management:
Allows users to create and manage data hierarchies for better capabilities in visuals.

Calculated Fields:
Users can create calculated columns and measures using DAX (Data Analysis Expressions) directly within the Fields pane.

Filters pane



The Filters pane enables users to apply filters to their data to control what data is displayed in their reports.

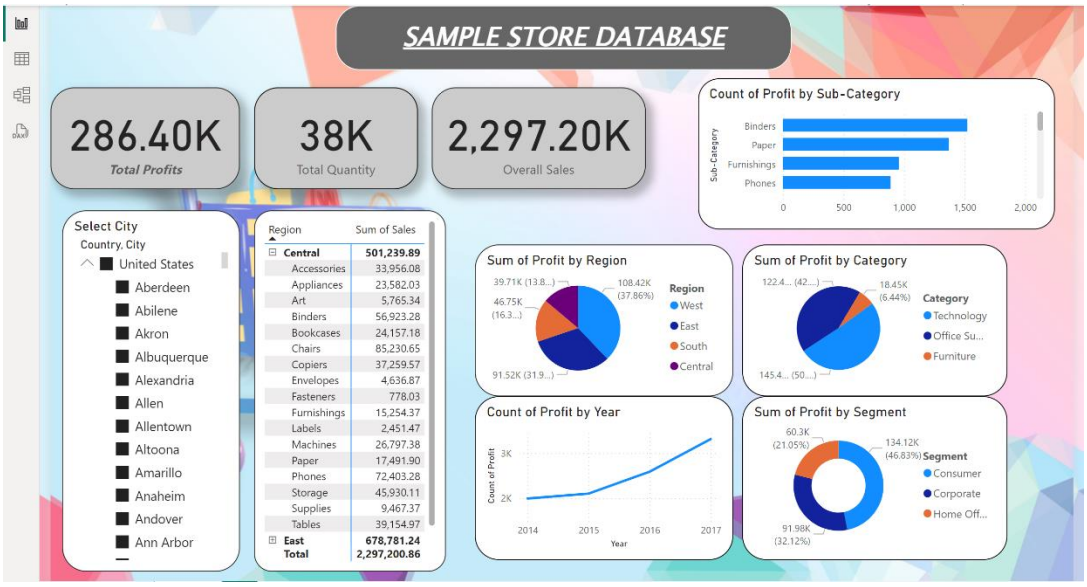
Location:
The Filters pane is located inside Visualization pane.

Types of Filters:
Visual-level filters: Affect only the selected visual.
Page-level filters: Affect all visuals on the current report page.
Report-level filters: Affect all visuals across the entire report.

Filter Conditions:
Users can specify filter conditions such as include/exclude values, numeric ranges, date ranges, and more.

Interactivity:
Filters can be interactive, allowing users to adjust filter settings dynamically to explore data from different perspectives.

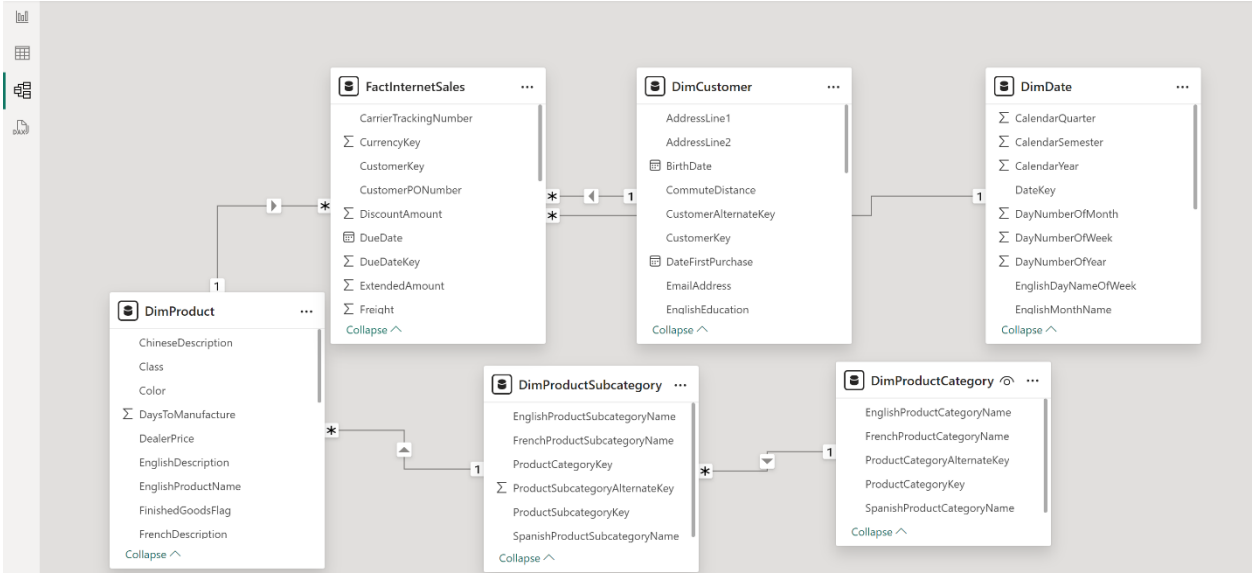
Report view



The Report view is where users create and design their reports.

Primary Workspace:
The Report view is the main area where users create, arrange, and customize their visualizations on the canvas.
Multiple Pages:
Users can create multiple report pages to organize different sections or aspects of their data.
Interactivity:
Users can set up interactive features such as slicers, filters, and drill through actions in the Report view.
Design Tools:
Provides various design tools and options to format visuals, apply themes, and add text boxes, shapes, and images.

Model view



The Model view allows users to manage relationships between tables and define the data model. Here are the key points:

Relationships:
Users can view and manage relationships between tables, ensuring the correct connections for data analysis.

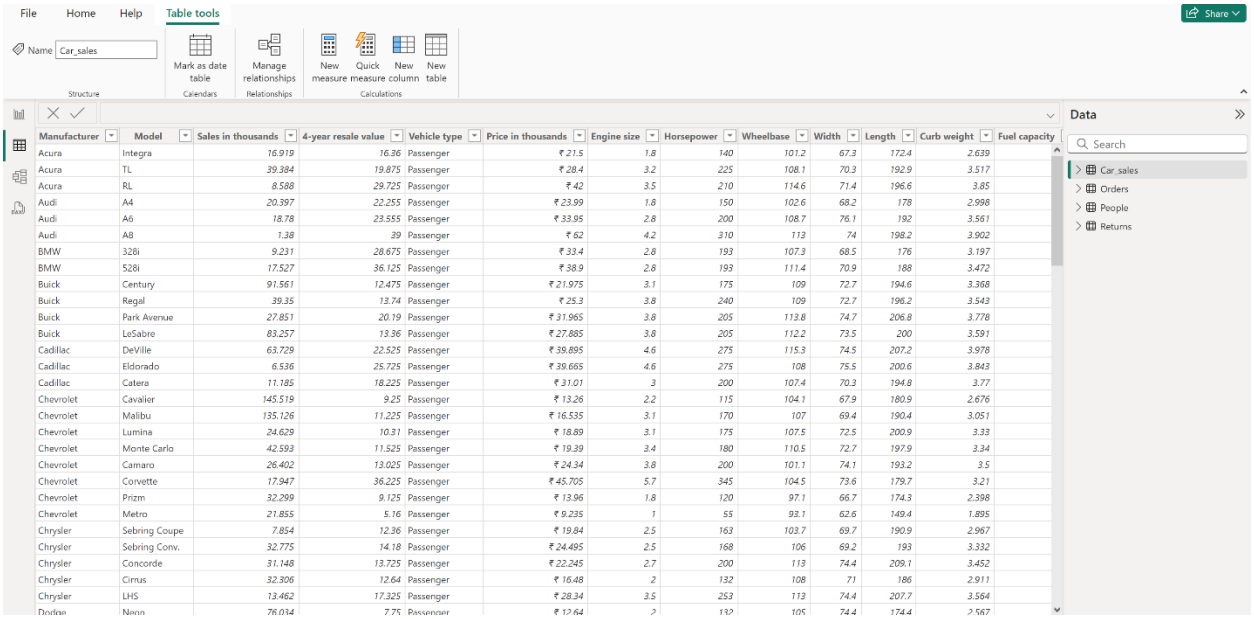
Diagram Layout:
Displays tables and their relationships in a visual diagram, making it easier to understand the data model.

Metadata Management:
Users can manage table properties, field properties, and define hierarchies.

Complex Models:
Supports the creation of complex data models with multiple tables and relationships, essential for advanced data analysis.

By leveraging these features, users can effectively manage their data, create insightful reports, and build comprehensive data models in Power BI Desktop.

Table view.



Manufacturer	Model	Sales in thousands	4-year resale value	Vehicle type	Price in thousands	Engine size	Horsepower	Wheelbase	Width	Length	Curb weight	Fuel capacity
Acura	Integra	16.919	16.36	Passenger	₹ 21.5	1.8	140	101.2	67.3	172.4	2.639	
Acura	TL	39.384	19.875	Passenger	₹ 28.4	3.2	225	108.1	70.3	192.9	3.517	
Acura	RL	8.588	29.725	Passenger	₹ 42	3.5	210	114.6	71.4	196.6	3.85	
Audi	A4	20.397	22.255	Passenger	₹ 23.99	1.8	150	102.6	68.2	178	2.998	
Audi	A6	18.78	23.555	Passenger	₹ 33.95	2.8	200	108.7	76.1	192	3.561	
Audi	A8	1.38	39	Passenger	₹ 62	4.2	310	113	74	198.2	3.902	
BMW	328i	9.231	28.675	Passenger	₹ 33.4	2.8	193	107.3	68.5	176	3.197	
BMW	528i	17.527	36.125	Passenger	₹ 38.9	2.8	193	111.4	70.9	188	3.472	
Buick	Century	91.561	12.475	Passenger	₹ 21.975	3.1	175	109	72.7	194.6	3.368	
Buick	Regal	39.35	13.74	Passenger	₹ 25.3	3.8	240	109	72.7	196.2	3.543	
Buick	Park Avenue	27.851	20.19	Passenger	₹ 31.965	3.8	205	113.8	74.7	206.8	3.778	
Buick	LeSabre	83.257	13.36	Passenger	₹ 27.885	3.8	205	112.2	73.5	200	3.591	
Cadillac	DeVille	63.729	22.525	Passenger	₹ 39.895	4.6	275	115.3	74.5	207.2	3.978	
Cadillac	Eldorado	6.536	25.725	Passenger	₹ 39.665	4.6	275	108	75.5	200.6	3.843	
Cadillac	Catera	11.185	18.225	Passenger	₹ 31.01	3	200	107.4	70.3	194.8	3.77	
Chevrolet	Cavalier	145.519	9.25	Passenger	₹ 13.26	2.2	115	104.1	67.9	180.9	2.676	
Chevrolet	Malibu	135.126	11.225	Passenger	₹ 16.535	3.1	170	107	69.4	190.4	3.051	
Chevrolet	Lumina	24.629	10.31	Passenger	₹ 18.89	3.1	175	107.5	72.5	200.9	3.33	
Chevrolet	Monte Carlo	42.593	11.525	Passenger	₹ 19.39	3.4	180	110.5	72.7	197.9	3.34	
Chevrolet	Camaro	26.402	13.025	Passenger	₹ 24.34	3.8	200	101.1	74.1	193.2	3.5	
Chevrolet	Corvette	17.947	36.225	Passenger	₹ 45.705	5.7	345	104.5	73.6	179.7	3.21	
Chevrolet	Prizm	32.299	9.125	Passenger	₹ 13.96	1.8	120	97.1	66.7	174.3	2.398	
Chevrolet	Metro	21.855	5.16	Passenger	₹ 9.235	1	55	93.1	62.6	149.4	1.895	
Chrysler	Sebring Coupe	7.854	12.36	Passenger	₹ 19.84	2.5	163	103.7	69.7	190.9	2.967	
Chrysler	Sebring Conv.	32.775	14.18	Passenger	₹ 24.495	2.5	168	106	69.2	193	3.332	
Chrysler	Concorde	31.148	13.725	Passenger	₹ 22.245	2.7	200	113	74.4	209.1	3.452	
Chrysler	Cirrus	32.306	12.64	Passenger	₹ 16.48	2	132	108	71	186	2.911	
Chrysler	LHS	13.462	17.325	Passenger	₹ 28.34	3.5	253	113	74.4	207.7	3.564	
Dodge	Neon	76.034	7.75	Passenger	₹ 12.64	2	132	105	74.4	174.4	2.567	

- The Data View, often referred to as Table View, in Power BI Desktop allows users to inspect and explore their data in a tabular format.
- The Data View can be accessed by clicking the Data icon on the left sidebar, which is represented by a table icon.
- Displays data in a spreadsheet-like format with rows and columns, similar to a table in Excel.
- Allows users to explore the data loaded into Power BI, view individual records, and understand the structure and content of their data tables.
- Users can see detailed information about each field, including data types, field values, and any applied transformations.
- While primarily for inspection, users can also perform some basic transformations and calculations directly in the Data View.
- Create calculated columns using DAX (Data Analysis Expressions) to add new fields based on existing data.

Data Validation:

Helps in validating data to ensure it is accurate and correctly imported.

Useful for identifying and correcting data quality issues before using the data in visualizations.

Understanding Relationships:

While relationships are managed in the Model View, the Data View allows users to see how data from different tables relates and to understand the context of their data.