

Question 1 : Define Power BI and What are the key components of the Power BI ecosystem? Briefly explain:

- Power BI Desktop
- Power BI Service
- Power BI Mobile
- Power BI Gateway

Answer : Power BI is a Business Intelligence (BI) tool developed by Microsoft.

It is used to analyze data and create interactive reports and dashboards for better decision-making.

Key Components of Power BI Ecosystem

1. Power BI Desktop

- A free Windows application
- Used to **connect data, clean data, and create reports**

2. Power BI Service

- Cloud-based (online) platform
- Used to **publish, share, and manage reports and dashboards**

3. Power BI Mobile

- Mobile app for Android and iOS
- Used to **view reports and dashboards on mobile devices**

4. Power BI Gateway

- Connects **on-premises (local) data sources** to Power BI Service
- Allows data refresh from local servers to the cloud

Question 2 : Compare the following Power BI visuals:

- Pie Chart vs Donut Chart
- Bar Chart vs Column Chart

When would you prefer one over the other? Give one example for each pair.

Answer : 1. Pie Chart vs Donut Chart

Pie Chart

- Shows part-to-whole relationship
- Best when there are few categories (2–5)
- Easy to understand

When to use:

When you want to clearly show percentage share

Example:

Market share of products (Product A 40%, B 35%, C 25%)

Donut Chart

- Similar to pie chart but has a hole in the center
- Center space can show total value or label
- Looks more visually attractive

When to use:

When you want part-to-whole + total value

Example:

Sales contribution by region with total sales shown in center

2. Bar Chart vs Column Chart

Bar Chart

- Bars are horizontal
- Best when category names are long
- Easy to compare many categories

When to use:

When labels are long or many items exist

Example:

Sales by product names with long product titles

Column Chart

- Bars are vertical
- Best for time-based data
- Very common and easy to read

When to use:

When comparing values over time (months/years)

Example:

Monthly sales from Jan to Dec

Question 3 : Explain the significance of:

- Star schema vs Snowflake schema
- Primary key vs Foreign key in relationships (Power BI)

Why is cardinality important?

Answer : 1. Star Schema vs Snowflake Schema**Star Schema**

- One fact table connected directly to dimension tables
- Simple design and faster performance
- Easy to understand and use in Power BI

Preferred when:

You want better performance and simple reporting

Example:

Sales Fact connected to Date, Product, Customer tables

Snowflake Schema

- Dimension tables are further normalized (split into sub-tables)
- More complex design
- Slightly slower performance

Preferred when:

Data is highly normalized and storage optimization is needed

Example:

Product → Category → Sub-Category in separate tables

2. Primary Key vs Foreign Key (in Power BI)

Primary Key

- A column with unique values
- Identifies each row in a table
- Cannot have duplicates or blanks

Example:

CustomerID in Customer table

Foreign Key

- A column that links to the primary key of another table
- Can have repeated values

Example:

CustomerID in Sales table

Why is Cardinality Important?

Cardinality defines the relationship type between tables:

- One-to-One (1:1)
- One-to-Many (1:*)

- Many-to-Many (:)

Importance:

- Ensures correct data relationships
- Prevents wrong totals and calculations
- Improves report accuracy and performance in Microsoft Power BI

Example:

One Customer → Many Sales (1:*)

If wrong cardinality is set, sales numbers may be incorrect.

Question 4 : Differentiate between:

- Calculated column vs Measure

Also, define Row context and Filter context with simple examples.

Answer : Calculated Column vs Measure

Calculated Column

- Calculated row by row
- Stored in the table (uses memory)
- Value is fixed once data is refreshed
- Used in rows, columns, filters, slicers

Example:

TotalPrice = Quantity * UnitPrice

→ Calculated for each row in Sales table

Measure

- Calculated on the fly
- Not stored in the table
- Changes based on filters and visuals
- Used mainly in values area

Example:

Total Sales = SUM(Sales[TotalPrice])
→ Value changes by year, region, product, etc.

Row Context vs Filter Context

Row Context

- Calculation works one row at a time
- Mostly used in calculated columns

Example:

In a Sales table,
Profit = Sales - Cost
→ Power BI calculates profit for each row separately

Filter Context

- Calculation works on filtered data

- Created by slicers, filters, rows/columns in visuals
- Mostly affects measures

Example:

If Year = 2024 is selected,
Total Sales shows only 2024 sales

Question 5: What is the difference between a report and a dashboard in Power BI?

Answer : Report (Power BI Report)

- Created in Power BI Desktop
- Can have multiple pages
- Uses data from one dataset
- Allows detailed analysis with filters and slicers
- More interactive

Example:

A sales report with separate pages for Monthly Sales, Product-wise Sales, and Region-wise Sales

Dashboard (Power BI Dashboard)

- Created in Power BI Service (online)
- Has only one page

- Can combine visuals from multiple reports/datasets
- Used for quick overview
- Less interactive than reports

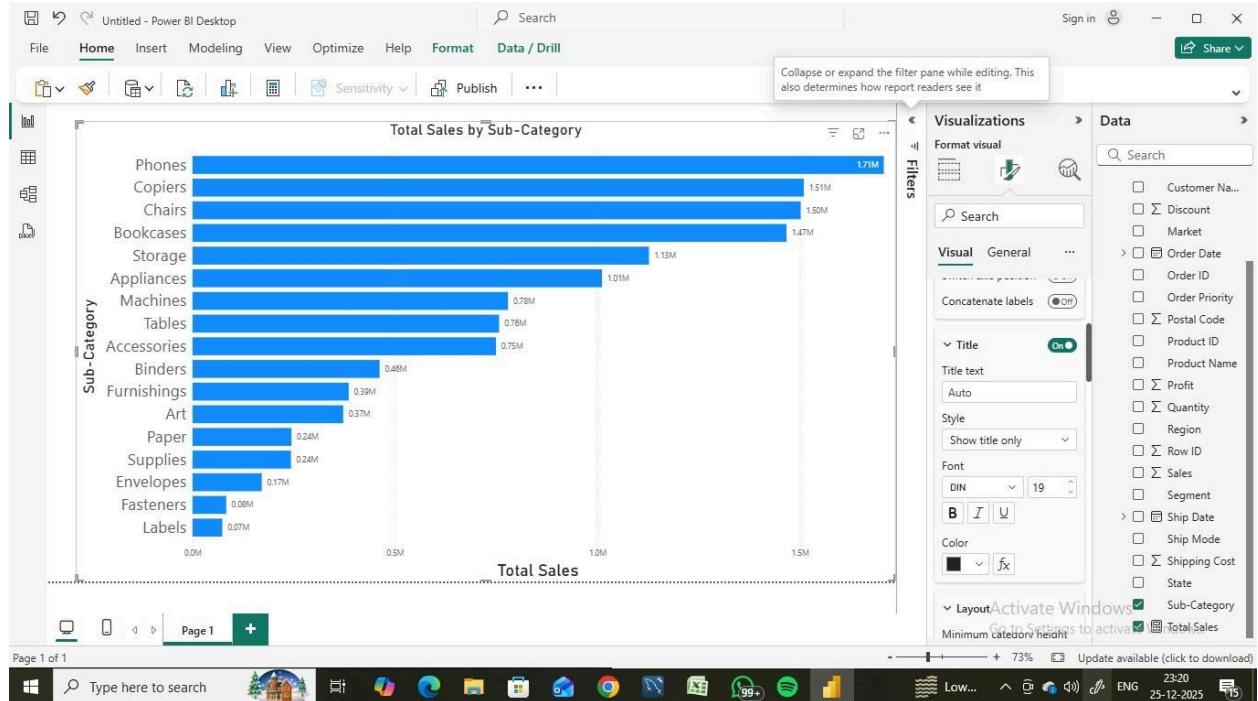
Example:

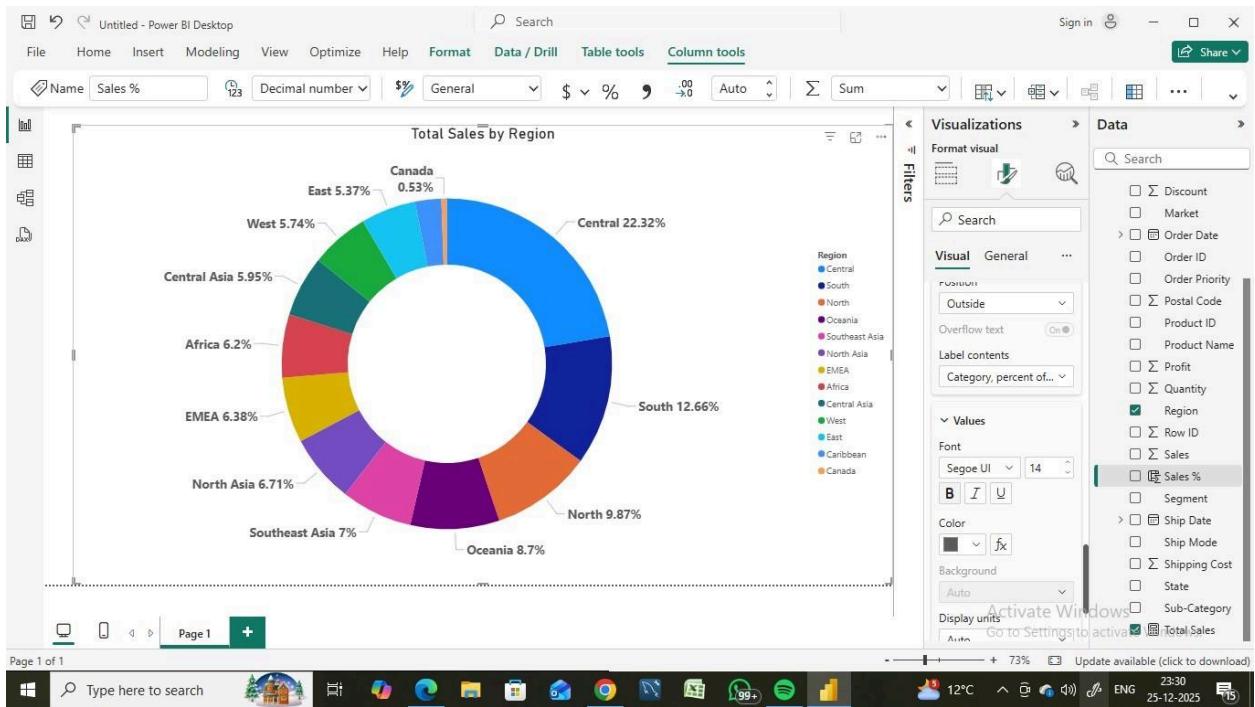
A one-page dashboard showing Total Sales, Profit, and Top Products at a glance

Question 6 : Using the Sample Superstore dataset:

- Create a Clustered Bar Chart to display Total Sales by Sub-Category
- Create a Donut Chart for Sales % by Region

Answer :





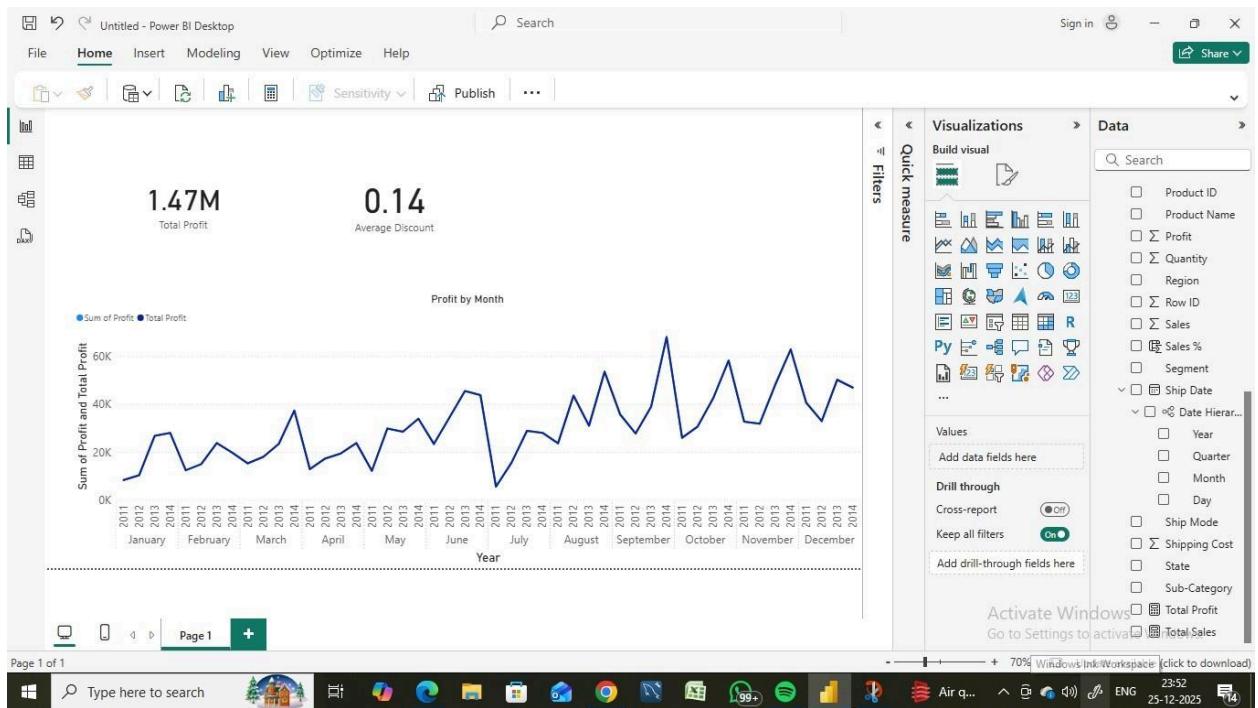
Question 7 : Write and apply the following measures:

- Total Profit = SUM([Profit])
- Average Discount = AVERAGE([Discount])

Display both in a KPI Card, and use a Line Chart to show profit trend over months.

Add visuals and DAX formulas.

Answer:



Question 8 : Implement a DAX measure that calculates the percentage of total sales by product category.

| Product Category | Sales Amount |
|------------------|--------------|
| Electronics | 5000 |
| Clothing | 3000 |
| Home Appliances | 7000 |
| Books | 2000 |
| Tables & Chairs | 8000 |
| Toy | 1500 |

Sports 1200

Equipment

Office 1000

Supplies

Beauty 4400

Products

Garden 1000

Supplies

Jewelry 1800

Automotive 2600

Answer:

The screenshot shows a Power BI Desktop interface with a table visualization. The table has three columns: 'Product Category', 'Sum of Sales Amount', and 'Sales % by Category'. The data includes various product categories and their corresponding sales amounts and percentages. The total sales amount is 38400, and the total percentage is 100.00%.

| Product Category | Sum of Sales Amount | Sales % by Category |
|------------------|---------------------|---------------------|
| Automotive | 2800 | 7.29% |
| Beauty Products | 4100 | 10.68% |
| Books | 2000 | 5.21% |
| Clothing | 3000 | 7.81% |
| Electronics | 5000 | 13.02% |
| Garden Supplies | 1000 | 2.60% |
| Home Appliances | 7000 | 18.23% |
| Jewelry | 1800 | 4.69% |
| Office Supplies | 1000 | 2.60% |
| Sports Equipment | 1200 | 3.13% |
| Tables & Chairs | 8000 | 20.83% |
| Toy | 1500 | 3.91% |
| Total | 38400 | 100.00% |