

Question 1: What is Power BI and why is it used in businesses?

Answer:

Power BI is a business intelligence and data visualization tool developed by Microsoft. It enables organizations to collect data from multiple sources, process and analyze it, and present the results in the form of interactive reports and dashboards. Power BI helps users transform raw data into meaningful information that supports effective decision-making.

Power BI is widely used in businesses because it offers the following benefits:

- Converts large volumes of raw data into clear and meaningful insights
- Helps management monitor Key Performance Indicators (KPIs) and business performance
- Supports data-driven and timely decision-making
- Provides real-time and interactive dashboards
- Reduces dependency on manual reporting and improves efficiency

By using Power BI, organizations can identify trends, detect problems at an early stage, and make faster, more accurate, and informed business decisions.

Question 2: Name and explain the three main components of Power BI.

Answer:

Power BI is a business intelligence tool developed by Microsoft. It consists of three main components that work together to collect, analyze, visualize, and share data-driven insights. These components are

Power BI Desktop, Power BI Service, and Power BI Mobile.

1. Power BI Desktop

Power BI Desktop is a Windows-based application used for creating reports and data models. It is mainly used by data analysts and report developers.

Key functions of Power BI Desktop include:

- Connecting to multiple data sources such as Excel, SQL Server, CSV files, and online databases
- Cleaning and transforming raw data using

- **Power Query**

- Creating data models and defining relationships between tables
- Designing interactive reports and visualizations using charts, tables, and slicers

Power BI Desktop is the first step in the Power BI workflow, where data preparation and report creation take place.

2. Power BI Service

Power BI Service is a cloud-based platform that allows users to publish, share, and manage reports created in Power BI Desktop.

Major features of Power BI Service include:

- Publishing reports and dashboards to the cloud
- Sharing reports with users across the organization
- Scheduling automatic data refresh
- Collaborating with team members using workspaces

Power BI Service enables decision-makers to access reports online without installing Power BI Desktop.

3. Power BI Mobile

Power BI Mobile is a mobile application available on Android and iOS devices. It allows users to view and interact with reports anytime and anywhere.

Key benefits of Power BI Mobile include:

- Viewing dashboards on smartphones and tablets
- Accessing real-time insights while on the move
- Receiving alerts on important KPIs and metrics

Power BI Mobile is especially useful for managers and executives who need quick access to business insights outside the office.

Conclusion

Question 3: Explain the Power BI Workflow

Answer:

The Power BI workflow explains the step-by-step process used to convert raw data into meaningful insights and interactive reports. It ensures data accuracy, proper modeling, and effective visualization for decision-making.

The main steps involved in the Power BI workflow are as follows:

1. Data Collection

In this step, data is collected from multiple sources such as Excel files, CSV files, databases, cloud services, and online sources. Power BI supports a wide range of data connectors.

2. Data Transformation (Power Query)

The collected data is cleaned and transformed using Power Query. This includes removing errors, handling missing values, renaming columns, changing data types, and filtering unwanted data to improve data quality.

3. Data Modeling

In this stage, relationships are created between different tables. Calculated columns and measures are also defined using DAX (Data Analysis Expressions) to support accurate analysis.

4. Report Creation

Interactive reports are created using visual elements such as charts, tables, slicers, cards, and graphs. These visuals help users understand patterns, trends, and insights easily.

5. Publishing

Once the report is ready, it is published to the Power BI Service. This allows reports to be accessed online and shared with other users.

6. Sharing and Refreshing

Reports and dashboards are shared with stakeholders. Data refresh schedules are set to ensure that reports always display updated information.

Conclusion:

The Power BI workflow provides a structured approach to data analysis, helping organizations convert raw data into actionable insights efficiently.

Question 4: List any four data cleaning tasks that can be performed in Power Query

Answer:

Power Query is a powerful data transformation tool in Power BI that helps in cleaning and preparing raw data before analysis. Proper data cleaning ensures accuracy, consistency, and better reporting results. Some common data cleaning tasks performed in Power Query are:

1. Removing Duplicate Rows

Duplicate records can cause incorrect analysis and misleading results. Power Query allows users to easily identify and remove duplicate rows based on one or multiple columns.

2. Handling Missing or Null Values

Missing or null values can affect calculations and visuals. Power Query provides options to replace null values, remove rows with missing data, or fill values using appropriate methods.

3. Changing Data Types

Sometimes data is imported in incorrect formats, such as numbers stored as text or dates stored as strings. Power Query allows users to change data types (text, number, date, etc.) to ensure accurate calculations.

4. Renaming Columns for Better Clarity

Column names may be unclear or inconsistent when data is imported. Power Query allows users to rename columns with meaningful and standardized names, improving data understanding and usability.

Conclusion:

These data cleaning tasks help improve data quality, ensure reliable analysis, and enhance the overall effectiveness of Power BI reports.

Question 5: Write step-by-step instructions to load the Real_Estate dataset in Power BI.

Answer:

To analyze any dataset in Power BI, the first step is to correctly load the data into Power BI Desktop. The following steps explain how to load the *Real_Estate* dataset in a systematic manner:

Step 1: Open Power BI Desktop

Start by launching the Power BI Desktop application on your computer.

Step 2: Click on “Get Data”

On the Home tab of Power BI Desktop, click on the **Get Data** option to connect to a data source.

Step 3: Select the Appropriate Data Source

Choose the file type of the Real_Estate dataset, such as **Excel** or **CSV**, depending on the dataset format.

Step 4: Browse and Select the Dataset

Click on **Browse**, navigate to the location where the Real_Estate dataset is saved, select the file, and click **Open**.

Step 5: Preview the Data

Power BI displays a preview window showing the dataset. This helps verify that the correct file and tables are selected.

Step 6: Open Power Query Editor (Optional)

If data cleaning or transformation is required, click **Transform Data** to open the Power Query Editor. Here, tasks such as removing duplicates, handling missing values, or changing data types can be performed.

Step 7: Apply Changes

After completing the necessary transformations, click on **Close & Apply** to load the cleaned data into Power BI.

Step 8: Data Loaded Successfully

The Real_Estate dataset is now loaded into Power BI and ready for analysis, visualization, and report creation.

Conclusion:

Following these steps ensures that the Real_Estate dataset is correctly imported, cleaned, and prepared for effective reporting and analysis in Power BI.

Question 6: Define Data View, Report View, and Model View. Explain the purpose of each view.

Answer:

Power BI provides three main views that help users manage data, build reports, and define relationships. Each view has a specific role in the report development process.

1. Data View

Definition:

Data View displays the loaded data in a tabular (row and column) format, similar to a spreadsheet.

Purpose:

- To check whether data has been loaded correctly
- To verify column values and data types
- To review individual records
- To perform basic calculations and create calculated columns

Explanation:

Data View helps analysts understand the structure and quality of the dataset before creating visuals. It allows users to inspect raw data without modifying the original source.

2. Report View

Definition:

Report View is used to design and build interactive reports and dashboards.

Purpose:

- Create charts, graphs, tables, and maps
- Apply filters, slicers, and visual-level interactions
- Arrange visuals to create meaningful reports
- Build interactive dashboards for decision-making

Explanation:

Report View is the most commonly used view in Power BI. It focuses on data visualization and helps convert raw data into visual insights that are easy to understand.

3. Model View

Definition:

Model View shows the relationships between different tables in the dataset.

Question 7: Discuss the different data sources that Power BI supports.

Answer:

Power BI supports a wide variety of data sources, which makes it a powerful and flexible business intelligence tool. These data sources can be broadly classified into the following categories:

1. File-Based Sources

Power BI can connect to different file formats such as:

- Excel (.xlsx)
- CSV (.csv)
- XML
- JSON
- Text files

These sources are commonly used for small to medium datasets and are easy to import.

2. Database Sources

Power BI supports several relational databases, including:

- SQL Server
- MySQL
- PostgreSQL
- Oracle Database

These databases are widely used in organizations to store structured data and allow real-time or scheduled data refresh.

3. Cloud-Based Services

Power BI can connect to cloud platforms such as:

- Azure SQL Database
- Google Analytics
- Azure Data Lake

These sources help in analyzing cloud-hosted and large-scale data efficiently.

4. Online Services

Power BI also supports online business applications like:

- SharePoint
- Salesforce
- Dynamics 365

This enables organizations to analyze data from web-based applications.

5. Other Data Sources

- Web data (URLs)

Question 8: Split Owner Name to create two new columns as First Name and Last Name (Real_Estate Dataset).

Answer:

To split the Owner Name column into First Name and Last Name, the following steps are performed using Power Query in Power BI:

Steps in Power Query:

1. Open **Power BI Desktop**
2. Click on **Transform Data** to open **Power Query Editor**
3. Select the **Owner Name** column
4. Go to the **Home** tab and click on **Split Column**
5. Choose **By Delimiter**
6. Select **Space (" ")** as the delimiter
7. Choose to split the column into **two columns**
8. Rename the new columns as **First Name** and **Last Name**
9. Click **Close & Apply** to save the changes

Result:

The Owner Name column is successfully divided into two separate columns: First Name and Last Name. This improves data clarity and makes filtering and analysis easier.

Explanation:

Splitting names into separate columns helps in better data organization and allows more accurate analysis, sorting, and reporting.