**Module 5:- Creating Dashboard with Visualization Tool**

1. **What is Power BI and how does it differ from Excel?**

**Answer:-** Power BI is a business analytics tool by Microsoft that allows users to visualize data and share insights. Unlike Excel, which is primarily a spreadsheet application for data manipulation and analysis, Power BI is optimized for large datasets, real-time dashboards, interactive visuals, and supports advanced data modeling.

1. **Explain the concept of data modeling in Power BI.**

**Answer:-** Data modeling in Power BI is the process of creating relationships between tables and adding calculated fields so Power BI can understand your data and analyze it correctly.

1. **What are the different types of connections available in Power BI?**

**Answer:-** Power BI supports several types of connections, including:

* Import Mode: Data is imported into Power BI and stored in its in-memory engine.
* Direct Query: Data remains in the source system, and queries are sent to the data source in real-time.
* Live Connection: A direct connection to a data source like SQL Server Analysis Services (SSAS) where data is queried live without importing it.

1. **How do you handle data transformation in Power BI?**

**Answer:-** Data transformation in Power BI is handled using Power Query Editor, where you clean, shape, and prepare data before using it in reports.Users can apply various transformations such as filtering rows, changing data types, merging tables, and creating calculated columns.

1. **What is DAX (Data Analysis Expressions) and why is it important in Power BI?**

**Answer:-** DAX is a formula language used in Power BI for creating custom calculations in calculated columns, measures, and tables.

1. **Can you explain the difference between calculated columns and measures in Power BI?**

**Answer:-**

* Calculated Columns: Stored in the data model and calculated row by row.
* Measures: Calculated at query time, used for aggregations and are more efficient.They are not stored in data model.

1. **How do you handle relationships between tables in Power BI?**

**Answer:-**  Relationships between tables in Power BI are managed in the data model view.Using the “Manage Relationships” window to define one-to-one, one-to-many, or many-to-many relationships.

1. **What is the purpose of a Power BI Gateway?**

**Answer:-** It enables Power BI Service to securely connect to on-premises data (like SQL Server) to the Power BI Service for scheduled refresh or DirectQuery.

1. **How can you schedule data refresh in Power BI Service?**

**Answer:-** After publishing a report, go to the dataset settings in Power BI Service and configure the refresh frequency (daily, hourly, etc.)

1. **Explain the concept of row-level security in Power BI.**

**Answer:-**  Row-level security (RLS) in Power BI allows users to restrict data access for specific users based on their roles.

1. **What is the Power BI Desktop and how does it differ from Power BI Service?**

**Answer:-** Power BI Desktop is a Windows application for creating reports, while Power BI Service is an online platform for sharing and collaborating on those reports.

1. **Explain the concept of Direct Query in Power BI.**

**Answer:-** DirectQuery in Power BI allows you to connect directly to a data source and query it in real-time, without importing the data into Power BI.

1. **What are Power BI templates and how are they useful?**

**Answer:-** Power BI templates (.pbit files) are reusable report files that contain the report layout, visuals, and queries, but without the actual data, making them useful for sharing and creating consistent reports across different datasets.

1. **How do you handle incremental data refresh in Power BI?**

**Answer:-** In Power BI, incremental data refresh is handled by enabling it in Power BI Desktop using date/time columns with parameters (e.g., Rangestart and RangeEnd), which allows refreshing only new or changed data, improving performance and efficiency.

Incremental Refresh loads only new or modified data during each refresh, instead of reloading the entire dataset every time.

1. **What is the role of Power Query in Power BI?**

**Answer:-** Power Query in Power BI is used to connect, clean, transform, and shape data before loading it into the data model for analysis and visualization.

1. **Explain the difference between calculated columns and calculated tables in Power BI**.

**Answer:-** Calculated Columns add new data to an existing table using DAX formulas row by row, while Calculated Tables create a new table entirely using DAX expressions based on other tables.

1. **How do you create custom visuals in Power BI?**

**Answer:-** To create custom visuals in Power BI:

* Use Marketplace: Go to Visualizations pane → click "Get more visuals" → choose from AppSource.
* Create with Developer Tools: Use Power BI Visuals SDK (based on TypeScript/JavaScript) to build your own.
* Import: Once created, import .pbiviz file into Power BI Desktop.

1. **What are the best practices for optimizing performance in Power BI?**

**Answer**:- Optimize Power BI performance by using star schema, minimizing data, preferring measures, and simplifying DAX and visuals.

1. **How can you integrate Power BI with other Microsoft products like Azure and Office 365?**

**Answer:-** You can integrate Power BI with Azure (e.g., Azure SQL, Synapse, Data Lake) for data sources and with Office 365 (e.g., Excel, SharePoint, Teams) for sharing, collaboration, and embedding reports.

1. **Explain the concept of aggregations in Power BI.**

**Answer:-** Aggregations in Power BI are techniques used to summarize detailed data (like sum, average, count) to improve report performance and simplify analysis.

1. **How do you handle error handling and data quality in Power BI?**

**Answer:-** In Power BI, error handling and data quality are managed using Power Query by applying steps like removing errors, filtering nulls, using data types, and applying validation rules during data transformation.

1. **What is the purpose of Power BI Embedded and when would you use it?**

**Answer:-** Power BI Embedded allows developers to embed Power BI reports and dashboards into their applications or websites, typically used when you want to share interactive analytics with users who don’t have a Power BI license.