**Creating Dashboard with Visualization Tool**

**ASSIGNMENT**

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

**Ans:** Power BI is a business intelligence tool used to visualize, analyze, and share

data interactively.

* Difference from Excel:
  + Excel is mainly for spreadsheets, calculations, and small-scale analysis.
  + Power BI is for large datasets, dashboards, automation, real-time reports, advanced visuals, and sharing in the cloud.

2) Explain the concept of data modelling in Power BI.

**Ans:** Data modelling means organizing multiple datasets (tables) into a structured model.

* It involves creating relationships, hierarchies, calculated columns, measures, and KPIs to enable meaningful analysis.
* Example: Linking Sales table with Customer and Product tables using primary/foreign keys.

3) What are the different types of connections available in Power BI?

**Ans:** Import Mode → Data is loaded into Power BI’s in-memory engine. Fast, but dataset size

is limited.

* Direct Query Mode → Queries are sent directly to the source database, no data stored in Power BI.
* Live Connection → Connects live to SSAS (SQL Server Analysis Services) models.
* Composite Mode → Combination of Import + Direct Query.

4) How do you handle data transformation in Power BI?

**Ans:** Handled using Power Query Editor.

* Common transformations: removing nulls, renaming columns, splitting/merging, pivot/unpivot, changing data types, filtering, adding custom columns.
* ETL (Extract, Transform, Load) steps are applied automatically every time the dataset is refreshed.

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

**Ans:** DAX is a formula language in Power BI used to create calculated columns, measures,

and tables.

* It is important because it allows advanced calculations, aggregations, time intelligence functions, and KPIs.

6) Difference between calculated columns and measures in Power BI?

**Ans:** Calculated Columns → Computed at row level, stored in the data model (uses memory).

* Measures → Calculated at query time (on the fly), do not store data, more efficient for large datasets.

7) How do you handle relationships between tables in Power BI?

**Ans:** Relationships are defined in the Model View.

* You define one-to-many (1:*), many-to-one (*:1), or many-to-many (*:*) relationships.
* You also manage cross-filter direction (single or both).

8) What is the purpose of a Power BI Gateway?

**Ans:** A Power BI Gateway connects on-premises data sources (like SQL Server, Oracle, SAP)

with Power BI Service.

* Purpose: Secure data refresh and live queries without moving the data to the cloud manually.

9) How can you schedule data refresh in Power BI Service?

**Ans:** Upload report to Power BI Service.

* Go to Dataset Settings → Scheduled Refresh.
* Set frequency (daily/weekly/hourly) and configure Gateway if using on-premises data.

10) Explain the concept of row-level security (RLS) in Power BI.

**Ans:** RLS restricts data access for different users.

* Example: A sales manager sees all sales, but a salesperson only sees their region’s sales.
* Implemented by defining roles with DAX filters (e.g., [Region] = "North").

11) What is Power BI Desktop and how does it differ from Power BI Service?

**Ans:** Power BI Desktop → Free Windows application for creating reports, transformations,

and models.

* Power BI Service → Cloud platform to publish, share, and collaborate on reports and dashboards.

12) Explain the concept of Direct Query in Power BI.

**Ans:** Direct Query allows Power BI to query data directly from the source database without

importing it.

* Useful for real-time analysis of large datasets, but performance depends on the source system.

13) What are Power BI templates and how are they useful?

**Ans:** Template (.pbit file) contains report layout, visuals, and queries but without the actual

data.

* Useful for reusing report structures across different datasets.

14) How do you handle incremental data refresh in Power BI?

**Ans:** Incremental refresh loads only new or changed data instead of reloading the entire

dataset.

* Configured in Power BI Service for large datasets to improve performance and save time.

15) What is the role of Power Query in Power BI?

**Ans:** Power Query is the ETL engine of Power BI.

* It allows connecting, cleaning, transforming, and shaping raw data into structured tables.

16) Difference between calculated columns and calculated tables in Power BI?

**Ans:** Calculated Column → Adds new column to existing table using DAX.

* Calculated Table → Creates an entirely new table derived from existing tables using DAX.

17) How do you create custom visuals in Power BI?

**Ans:** Use Power BI Developer Tools (Node.js, TypeScript, and D3.js).

* Alternatively, download from Power BI Marketplace (AppSource).

18) Best practices for optimizing performance in Power BI?

**Ans**: Use Import Mode for smaller datasets.

* Reduce number of visuals on one page.
* Use star schema (not snowflake).
* Avoid too many calculated columns (use measures).
* Enable aggregations and incremental refresh.

19) How can you integrate Power BI with Azure and Office 365?

**Ans:** With Azure: Connect to Azure SQL DB, Azure Data Lake, Azure Synapse, ML models.

* With Office 365: Embed reports in Teams, SharePoint, Excel, and Outlook.

20) Explain the concept of aggregations in Power BI.

**Ans:** Aggregations summarize detailed data into higher-level data.

* Example: Instead of millions of sales transactions, aggregate to monthly sales per region.
* Improves query performance.

21) How do you handle error handling and data quality in Power BI?

**Ans**: Use Power Query to detect and clean errors (remove nulls, replace values, data type

corrections).

* Create error-handling logic in DAX (using IFERROR(), COALESCE()).
* Validate transformations at each ETL step.

22) What is the purpose of Power BI Embedded and when would you use it?

**Ans:** Power BI Embedded allows developers to embed Power BI reports/dashboards into

their own apps or websites.

* Useful when organizations want to provide analytics to customers without giving them direct access to Power BI Service.