
POWER BI ASSESSMENT

1)What is Power BI?

Power BI is a collection of software services, apps, and connectors that work together to turn your unrelated sources of data into coherent, visually immersive, and interactive insights. Your data might be an Excel spreadsheet, or a collection of cloud-based and on-premises hybrid data warehouses. Power BI lets you easily connect to your data sources, visualize and discover what's important, and share that with anyone or everyone you want.

2)Why use Power BI?

Power BI is used for creating interactive dashboards and reports, enabling data visualization, real-time monitoring, and informed decision-making across various business functions like sales, finance, and operations.

3)Difference Between Pro and Premium in Power BI?

Features	Power BI Premium	Power BI Pro
Data capacity limit	100 TB	10 GB per user
Data refresh rate	Up to 48 times per day	Up to 8 times per day
Data streaming rate	Up to 5 million rows per hour	Up to 1 million rows per hour
Report export options	PowerPoint, PDF, Excel, CSV, XML	PowerPoint, PDF, Excel
AI Capabilities	Q&A, quick insights, dataflows, cognitive Services, AutoML	Q&A, quick insights, dataflows
Security features	Row-level security, data encryption, audit logs, sensitivity labels, encryption at rest and in transit	Row-level security, data encryption,

4)What are Building Blocks of Power BI?

There are five Power BI building block are:

- Visualizations
- Datasets
- Reports
- Dashboards
- Tiles

5) Power BI Components and explain in details?

1. Power BI Desktop

Power BI Desktop is a Windows-based application that allows users to create detailed reports and data models. It is the main authoring and development tool for Power BI, where users can connect to data sources, transform data, create visualizations, and build reports.

2. Power BI Service (Power BI Online)

Power BI Service is a cloud-based platform where users can share, collaborate on, and distribute reports and dashboards created in Power BI Desktop. It is a Software as a Service (SaaS) that enables real-time data sharing and collaboration across an organization.

3. Power Query

Power Query is a data connection technology that enables users to discover, connect, combine, and refine data across a wide variety of sources. It is integrated within Power BI Desktop and Excel.

4. Power Pivot

Power Pivot is an in-memory data modeling component used to create complex data models, perform calculations, and analyze large volumes of data quickly. It is integrated into Power BI Desktop and Excel.

6)What is Power Query in Power BI?

Power Query in Power BI is a data connection and transformation tool that allows users to import, clean, transform, and shape data from various sources before using it in reports and dashboards. It is an essential part of the data preparation process in Power BI, helping users to get their data ready for analysis.

7)What is Power BI Report?

A Power BI report is a multi-perspective view into a semantic model, with visuals that represent findings and insights from that semantic model. A report can have a single visual or many pages full of visuals.

8)What are relationships in Power BI?

- **One-to-One:** Each row in one table corresponds to a single row in another table.
- **One-to-Many:** A row in one table can relate to multiple rows in another table.
- **Many-to-Many:** Multiple rows in one table can relate to multiple rows in another table.

9)What is the difference between star schema and snowflake schema?

S.NO	Star Schema	Snowflake Schema
1.	In star schema , The fact tables and the dimension tables are contained.	While in snowflake schema , The fact tables, dimension tables as well as sub dimension tables are contained.
2.	Star schema is a top-down model.	While it is a bottom-up model.
3.	Star schema uses more space.	While it uses less space.
4.	It takes less time for the execution of queries.	While it takes more time than star schema for the execution of queries.
5.	In star schema, Normalization is not used.	While in this, Both normalization and denormalization are used.
6.	It's design is very simple.	While it's design is complex.
7.	The query complexity of star schema is low.	While the query complexity of snowflake schema is higher than star schema.
8.	It's understanding is very simple.	While it's understanding is difficult.
9.	It has less number of foreign keys.	While it has more number of foreign keys.
10.	It has high data redundancy.	While it has low data redundancy.

10)How do you handle many-to-many relationships in Power BI?

1. Create a Bridge Table:

- Use a bridge table (also called a junction table or intermediate table) to manage the many-to-many relationship. This table should contain unique keys from both related tables.

2. Define Relationships:

- Establish relationships between the bridge table and each of the other tables using these unique keys. Ensure these relationships are set as "Single" or "Both" directions as needed.

3. Use DAX Measures:

- Implement DAX measures to manage aggregations and calculations. For example, you can use functions like RELATEDTABLE and CALCULATE to handle complex many-to-many scenarios.

4. Filter and Aggregate Data:

- Ensure that your visualizations and calculations account for the bridge table to accurately reflect the many-to-many relationships in your reports.

11) What are the different ways to connect to data sources in Power BI?

1. Get Data:

- **From File:** Connect to various file formats like Excel, CSV, JSON, and more.
- **From SQL Server:** Connect to SQL Server databases and execute queries.
- **From Azure:** Connect to Azure data sources like SQL Database, Data Warehouse, Analysis Services, and more.
- **From Online Services:** Connect to online services like Salesforce, Dynamics 365, Google Analytics, and others.
- **From Other Sources:** Connect to various other sources like OData feeds, Web APIs, and more.

2. Direct Query:

- This mode connects directly to the data source at query time, providing real-time data but potentially impacting performance

3. Import:

- This mode imports data into Power BI for analysis, providing faster query performance but requiring regular refreshes.

4. Composite Models:

- Combine Direct Query and Import modes in a single model for a hybrid approach.

5. Dataflows:

- Transform and prepare data in the cloud before importing it into Power BI, improving data quality and efficiency.

6. Data Gateway:

- Use a data gateway to connect to on-premises data sources securely.

12) What is Direct Query in Power BI?

Direct Query in Power BI is a connection mode that allows you to connect directly to your data source at query time. This means that when you create a report or dashboard, the data is not imported into Power BI. Instead, the queries are sent directly to the data source, and the results are displayed in your report.

13) What is Cardinality and types of Cardinality?

Cardinality in Power BI refers to the nature of the relationships between tables in a data model, specifically how many unique values in one table relate to unique values in another table. Understanding cardinality helps in designing accurate data models and relationships.

Types of Cardinality

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

14) What are the types of joints?

Types of Joints

- **Inner Joints**
- **Left Outer Joints**
- **Right Outer Joints**
- **One-to-One (1:1):**
- **One-to-Many (1:N):**
- **Many-to-Many (M:N):**

15) Think to keep in mind while developing models?

1. Problem Definition:

- Clearly define the problem you're trying to solve.
- Understand the goals and objectives of the model.

2. Data Quality and Quantity:

- Ensure data is clean, accurate, and relevant to the problem.
- Have sufficient data to train and validate the model effectively.

3. Feature Engineering:

- Select or create features that are informative and relevant to the problem.
- Consider feature transformations and interactions.

4. Model Selection:

- Choose appropriate algorithms based on the problem type (e.g., classification, regression, clustering).
- Consider factors like model complexity, interpretability, and computational cost.

5. Hyperparameter Tuning:

- Optimize model performance by tuning hyperparameters.
- Use techniques like grid search or random search.

6. Model Evaluation:

- Use appropriate metrics to evaluate model performance.
- Consider factors like accuracy, precision, recall, F1-score, and mean squared error.
- Split data into training, validation, and testing sets to prevent overfitting.

7. Interpretability:

- Understand how the model makes decisions.
- Use techniques like feature importance or SHAP values to explain model predictions.

8. Bias and Fairness:

- Be aware of potential biases in the data and model.
- Take steps to mitigate bias and ensure fairness in the model's output.

9. Generalization:

- Ensure the model performs well on unseen data.
- Avoid overfitting by balancing training and validation.

10. Deployment and Monitoring:

- Consider the deployment environment and infrastructure.
- Monitor model performance in production and retrain as needed.

