

Data Analytics

1. What is Power BI, and how does it differ from Excel? Power BI is a business intelligence tool for data visualization, reporting, and analytics. Unlike Excel, which is mainly for spreadsheet-based calculations and data manipulation, Power BI is designed for handling large datasets, creating interactive reports, and integrating with multiple data sources efficiently.

2. Explain the concept of data modeling in Power BI. Data modeling in Power BI involves structuring and defining relationships between multiple tables to create a logical data representation. It helps in efficient querying, performance optimization, and better data analysis.

3. What are the different types of connections available in Power BI? Power BI provides three main types of connections:

- **Import Mode** (loads data into Power BI)
- **Direct Query** (connects live to the data source without importing)
- **Live Connection** (used for SSAS, providing real-time updates)

4. How do you handle data transformation in Power BI? Data transformation is done using **Power Query Editor**, which allows cleaning, shaping, and modifying data through operations like filtering, merging, pivoting, and adding calculated columns.

5. What is DAX and why is it important in Power BI? DAX (Data Analysis Expressions) is a formula language used in Power BI for data calculations and aggregations. It is important for creating custom metrics, calculated columns, and complex business logic.

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

- **Calculated Columns:** Stored in the data model and computed row-wise.
- **Measures:** Computed at runtime, providing dynamic calculations without increasing data size.

7. How do you handle relationships between tables in Power BI? Relationships are managed in **Model View** by defining one-to-one, one-to-many, or many-to-many relationships. Power BI automatically detects relationships, but they can also be manually defined.

8. What is the purpose of a Power BI gateway? A Power BI gateway enables secure data transfer between on-premises data sources and Power BI cloud services, allowing scheduled and live data refreshes.

9. How can you schedule data refresh in Power BI Service? Scheduled refresh is configured in **Power BI Service** under dataset settings, where frequency and time intervals are set to update the data automatically.

10. Explain the concept of Row-Level Security (RLS) in Power BI. RLS restricts data access based on user roles. It is implemented using **DAX filters** in Power BI Desktop and assigned to users in Power BI Service.

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

- **Power BI Desktop:** Used for report creation and data modeling.
- **Power BI Service:** A cloud-based platform for sharing, collaborating, and scheduling report updates.

12. Explain the concept of Direct Query in Power BI. Direct Query allows Power BI to connect directly to a data source without importing data. It ensures real-time data updates but may have performance limitations.

13. What are Power BI templates and how are they useful? Power BI templates (.PBIT) store report structure without data, enabling users to reuse and apply predefined reports to different datasets.

14. How do you handle incremental data refresh in Power BI? Incremental refresh loads only new or changed data instead of the entire dataset, improving performance and efficiency. It is configured in **Power Query**.

15. What is the role of Power Query in Power BI? Power Query is used for ETL (Extract, Transform, Load) processes, allowing data cleansing, transformation, and integration from multiple sources.

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

- **Calculated Columns:** Create new columns within a table using DAX.
- **Calculated Tables:** Generate entirely new tables derived from existing data.

17. How do you create custom visuals in Power BI? Custom visuals are created using **Power BI Developer Tools** with TypeScript and D3.js or imported from the Power BI marketplace.

18. Best practices for optimizing performance in Power BI?

- Use **aggregated data**
- Optimize **DAX queries**
- Use **star schema modeling**
- Implement **incremental refresh**
- Reduce unnecessary visuals and calculations

19. How can you integrate Power BI with Microsoft products like Azure and Office 365? Power BI integrates with Azure services (Azure Synapse, Azure Data Lake) and Office 365 (Excel, SharePoint, Teams) through built-in connectors and APIs.

20. Explain the concept of aggregation in Power BI. Aggregation is a process where large datasets are summarized at different levels (e.g., sum, average) to improve report performance and efficiency.

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

- Use **Power Query** for data cleaning
- Implement **DAX error handling functions**
- Monitor **data refresh errors**
- Use **data profiling tools** in Power Query

22. What is the purpose of Power BI Embedded and when would you use it? Power BI Embedded allows embedding Power BI reports into applications using APIs, enabling users to view insights within custom applications without accessing Power BI Service.