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

* Power BI is a business intelligence (BI) tool that enables users to analyze data, create visualizations, and share insights through interactive dashboards and reports.
* Excel is a versatile spreadsheet program that is widely used for data manipulation, analysis, and visualization. While not as advanced as Power BI for BI tasks, Excel is highly flexible and remains a staple for everyday data work.
* **Power BI** if you need to work with large datasets, create interactive visualizations, or share insights at scale in a collaborative environment.
* **Excel** for smaller datasets, ad hoc analysis, or tasks requiring spreadsheet-style calculations and data entry.

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

* Data modeling in Power BI refers to the process of structuring and organizing data from multiple sources into a cohesive framework to enable effective analysis and reporting. This involves defining relationships between tables, creating calculated fields, and optimizing data for performance and usability in reports and dashboards.

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

* Power BI offers different types of connections to access and work with data from various sources.

**Import Mode**

* In Import Mode, data from the source is loaded into Power BI and stored in-memory for analysis.

**DirectQuery Mode**

* In **DirectQuery Mode**, Power BI queries the data source directly for every user interaction, without storing data in Power BI.

**Live Connection**

* In a Live Connection, Power BI connects directly to a live data model, typically hosted on a server like SQL Server Analysis Services (SSAS), Azure Analysis Services, or a Power BI dataset.

**Composite Models**

* A Composite Model allows combining Import Mode and DirectQuery in the same report.

**Dataflows (Cloud Storage Connection)**

* Power BI Dataflows are reusable ETL processes that connect to a variety of data sources, allowing transformation and storage in the cloud.

**Real-Time Streaming**

* Power BI supports real-time connections to stream data directly into dashboards via **Push datasets**, **Streaming datasets**, or **PubNub**.

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

* Data transformation in Power BI involves using the Power Query Editor to clean, shape, and prepare data for analysis.
* Open Power Query Editor
* Perform Data Cleaning and Shaping
* Transform Data Structure
* Enhance Data with Calculations
* Data Type and Formatting Adjustments
* Combine Data Sources
* Apply Changes

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

**Power BI?**

* DAX (Data Analysis Expressions) is a formula language specifically designed for creating custom calculations and measures in Microsoft tools like Power BI, Excel Power Pivot, and SQL Server Analysis Services (SSAS). It is a collection of functions, operators, and constants that can be combined to create expressions for analyzing and manipulating data.

**Important**

* Dynamic Data Insights
* Enhanced Data Modeling
* Advanced Time Intelligence
* Custom Metrics
* Improved Visualizations
* Scalable and Reusable

1. **Can you explain the difference between calculated columns and**

**measures in Power BI?**

* Both calculated columns and measures are created using DAX (Data Analysis Expressions) in Power BI, but they serve different purposes and are used in different scenarios.
* **Calculated Columns**

A calculated column is a new column added to a table in the data model, where each row contains a calculated value based on the DAX expression applied to it.

* **Measures**

A measure is a dynamic calculation that is performed on-demand, typically aggregated based on the filters and context applied in a report.

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

* Relationships between tables in Power BI enable you to create a coherent data model by linking related data from different tables.
* Accessing and Viewing Relationships
* Creating Relationships
* Relationship Properties

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

* A Power BI Gateway is a bridge that enables secure data transfer between on-premises data sources (e.g., databases, files, or other services) and Power BI services in the cloud. It ensures that data hosted within an organization’s local network can be accessed by cloud-based services without compromising security or requiring data replication.

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

* Scheduling data refresh in the Power BI Service ensures that your datasets, reports, and dashboards display up-to-date information from connected data sources.

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

* Row-Level Security (RLS) is a feature in Power BI that restricts data access at the row level, allowing you to control which data users can see in a report or dashboard. This ensures that sensitive data is only visible to users who are authorized to view it, providing a way to implement data governance and privacy within reports.

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

**BI Service?**

* Power BI Desktop and Power BI Service are two key components of Microsoft's Power BI platform, but they serve different purposes and have distinct functionalities.

**Power BI Desktop**

* Power BI Desktop is a Windows application primarily used for data preparation, modeling, and report creation. It's designed for developers, analysts, and data professionals to work locally on their systems.

### ****Power BI Service****

* Power BI Service is a cloud-based platform designed for sharing, collaboration, and deployment of reports and dashboards. It is part of the broader Power BI ecosystem accessible via a web browser.

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

* **DirectQuery** is a data connectivity mode in Power BI that allows users to directly query the data from the source system in real-time, without importing the data into Power BI. It is an alternative to the **Import** mode, where data is fully loaded into Power BI's memory. DirectQuery is particularly useful for working with large datasets or when up-to-the-minute data is needed.

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

* Power BI Templates are reusable design files with the extension .pbit that save the structure, layout, and configuration of a Power BI report without including the underlying data. These templates allow users to replicate a report's design and functionality while connecting to different data sources.

**Useful:**

* Standardization Across Reports
* Time Savings
* Parameterization
* Collaboration
* Onboarding New Users
* Efficiency in Scalability

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

* Incremental Data Refresh in Power BI is a method to load and update only the new or changed data from a data source, instead of reloading the entire dataset. This improves performance, reduces resource usage, and speeds up data refresh operations, especially for large datasets.

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

* Power Query is a data transformation and data preparation tool integrated into Power BI. It allows users to connect to various data sources, clean, transform, and shape data before loading it into the Power BI data model. This step is essential to ensure that the data is well-structured and ready for analysis.

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

* Calculated Columns and Calculated Tables in Power BI are both created using DAX (Data Analysis Expressions) and play a role in enriching your data model.

**Calculated Column**

* A calculated column is a new column added to an existing table. Each row in the column is calculated based on a DAX expression applied to the table's other columns.

**Calculated Table**

* A calculated table is an entirely new table generated by a DAX expression. It is useful for creating a custom dataset based on existing data.

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

* Creating custom visuals in Power BI involves developing bespoke data visualizations tailored to specific business needs. Power BI custom visuals are built using the Power BI Visuals SDK with TypeScript and D3.js, among other libraries.

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

**Power BI?**

* Optimizing performance in Power BI involves improving report responsiveness, minimizing data processing times, and ensuring efficient resource usage.
* Data Model Optimization
* Query Optimization
* DAX Optimization
* Visualization Optimization
* Data Refresh Optimization
* Resource Management

1. **How can you integrate Power BI with other Microsoft**

**products like Azure and Office 365?**

* Power BI integrates seamlessly with other Microsoft products, such as Azure and Office 365, to enhance analytics, collaboration, and data management.

**Integration with Azure**

* Azure Data Sources
* Azure Analysis Services
* Azure Machine Learning
* Azure Logic Apps
* Azure Stream Analytics
* Azure Active Directory (AAD)

**Integration with Office 365**

* Microsoft Teams
* Excel
* SharePoint
* Power Automate
* Outlook

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

* Aggregations in Power BI refer to the process of summarizing detailed data into a smaller, more manageable dataset to improve performance and usability. Aggregations are particularly useful for large datasets, where querying detailed data can lead to performance bottlenecks.
* Power BI allows you to define and use aggregations effectively in models to accelerate query performance without losing the ability to drill down into detailed data when needed.

**Key Concepts of Aggregations**

* Granularity Levels
* Storage Optimization
* Pre-Computed Aggregations
* Query Acceleration

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

**BI?**

* Error handling and data quality in Power BI are managed through a combination of tools and practices to ensure accurate and reliable reports. Power Query is a key tool for identifying and addressing data quality issues, allowing users to detect errors, replace invalid values, remove nulls, and transform data to meet expected standards.

1. **What is the purpose of Power BI Embedded and when would**

**you use it?**

* Power BI Embedded is a Microsoft Azure service that allows developers to integrate Power BI reports and dashboards into custom applications, websites, or portals.

**Purpose of Power BI Embedded**

* Embed Analytics in Applications
* Enhance User Experience
* Extend Insights Beyond the Organization
* Custom Branding and Experience

**When to Use Power BI Embedded**

* External Users
* Custom Application Development
* Integration into Customer Portals
* White-Label Solutions
* High-Volume Scenarios