Power BI

**1. What is Power BI?**

Power BI is a business analytics service by Microsoft that provides interactive visualizations and business intelligence capabilities with an interface simple enough for end users to create their own reports and dashboards.

**2. Why use Power BI?**

Power BI is used for transforming raw data into actionable insights through reports and dashboards. It allows for real-time data access, interactive data visualizations, data sharing, and is integrated with other Microsoft products, making it a powerful tool for data analysis and business decision-making.

**3. Difference between Pro and Premium.**

* **Power BI Pro:** A per-user license that provides access to all Power BI features, including collaboration, sharing, and data modeling. It’s suitable for individual users or small teams.
* **Power BI Premium:** A capacity-based license that supports larger datasets, advanced AI features, and broader scalability. It’s ideal for organizations with large-scale deployment needs and offers better performance and dedicated cloud resources.

**4. What are Building Blocks of Power BI?**

  The building blocks of Power BI include:

* **Visualizations:** The visual representation of data.
* **Datasets:** Collections of data that you import or connect to.
* **Reports:** A collection of visualizations on one or more pages.
* **Dashboards:** A single page that contains various visualizations.
* **Tiles:** A single visualization on a report or dashboard.

**5. Power BI Components and Explain in Detail.**

* **Power BI Desktop:** A Windows desktop application for creating reports.
* **Power BI Service:** An online service (SaaS) for sharing, publishing, and collaborating on reports.
* **Power BI Mobile Apps**: Apps available for iOS, Android, and Windows to view reports and dashboards on the go.
* **Power BI Gateway:** Bridges between on-premises data sources and Power BI services.
* **Power BI Embedded:** Allows developers to embed Power BI reports into other applications.
* **Power BI Report Server**: An on-premises report server where you can publish your Power BI reports.

**6. What is Power Query in Power BI?**

   Power Query is a data connection technology that enables you to discover, connect, combine, and refine data across a wide variety of sources, making it ready for analysis.

**7. What is a Power BI Report?**

    A Power BI report is a collection of visualizations, often from a single dataset, laid out on one or more pages. It provides insights and a summary of the data.

**8. What are Relationships in Power BI?**

    Relationships in Power BI refer to the connections between tables in a data model, enabling you to create complex data structures and derive insights across multiple datasets.

**9. What is the Difference between a Star Schema and a Snowflake Schema?**

* **Star Schema:** A simpler schema where each dimension is directly linked to the fact table.
* **Snowflake Schema:** A more complex schema where dimensions are normalized into multiple related tables.

**10. How Do You Handle Many-to-Many Relationships in Power BI?**

    You can handle many-to-many relationships by using bridge tables (also known as junction tables) or by enabling the many-to-many relationship feature directly in Power BI, which simplifies model design but requires careful management of data integrity.

**11. What are the Different Ways to Connect to Data Sources in Power BI?**

    Data sources can be connected in Power BI via:

* **Importing Data:** Pulls data into Power BI.
* **Direct Query:** Queries the data in real-time without importing it.
* **Live Connection:** Similar to Direct Query but primarily used with SSAS (SQL Server Analysis Services) data.

**12. What is Direct Query in Power BI?**

    Direct Query is a method of connecting to a data source where data is not imported into Power BI, but queries are sent directly to the data source each time a user interacts with a report. This is ideal for large datasets or real-time data.

**13. What is Cardinality and Types of Cardinality?**

    Cardinality refers to the uniqueness of data values in a column.

**Types of cardinality include:**

* One-to-One (1:1): Each record in one table relates to a single record in another table.
* One-to-Many (1: N): A single record in one table relates to multiple records in another table.
* Many-to-Many (N: N): Multiple records in one table relate to multiple records in another table.

**14. Types of Joins.**

    The types of joins in Power BI include:

* **Inner Join:** Returns records that have matching values in both tables.
* **Left Outer Join**: Returns all records from the left table and matched records from the right table.
* **Right Outer Join:** Returns all records from the right table and matched records from the left table.
* **Full Outer Join:** Returns all records when there is a match in either left or right table.
* **Cross Join:** Returns the Cartesian product of both tables.

**15. Things to Keep in Mind While Developing a Model?**

* **Data Integrity:** Ensure that your data is clean and well-organized.
* **Performance:** Optimize your model for quick queries and report rendering.
* **Scalability:** Plan your model to handle growth in data size and complexity.
* **Usability:** Make sure the model is easy for end-users to understand and use.
* **Security:** Implement proper data security and access control measures.