1. **what is Power BI and How does it different from Excel?**

**Power BI** – Best for data visualization, large datasets, automation, and interactive dashboards.

**Excel** – Best for calculations, quick analysis, and structured data handling.

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| --- | --- | --- |
| **Feature** | **Power BI** | **Excel** |
| **Purpose** | BI & Dashboards | Data analysis |
| **Speed** | Faster for big data | Slower with large data |
| **Automation** | Auto-refresh | Manual updates |
| **Visualization** | Advanced & interactive | Basic charts & tables |

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

**Data modelling** in Power BI is the process of organizing and connecting data tables to enable efficient analysis and reporting.

**KEY CONCEPTS:**

**Tables & Relationships** – links multiple tables using Primary-Foreign Key.

**Fact & Dimension Tables** – Fact stores numeric data, Dimension stores descriptive data.

**DAX (Data Analysia Expressions)** – Used for custom calculations.

**Schemas (Star & Snowflake)** – Defines data structure for better performance.

**Filters –** controls data flow between tables.

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

**Import Mode –** loads data into memory for fast performance but needs refresh.

**Direct Query -** connects live to the database, great for real-time updates, but slower.

**Live connection** – Direct link to SSAS/OLAP, no data stored in power BI

**Composite Mode** – Mix of import + Direct Query for flexibility.

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

Data Transformation in Power BI handled using Power Query Editor for cleaning and shaping data.

**Key Steps:**

**Remove Duplicates & Errors –** Ensures clean data.

**Change Data Types** –converts text, numbers, and dates correctly

**Merge & Append** –Combines multiple tables.

**Filter, Sort & Group** –organizes data for analysis.

**Create Custom Columns** – Adds new calculated fields.

**Pivot & Unpivot** – Reshapes data for reporting.

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

DAX (Data Analysis Expression) is a formula language used in power BI, Excel, and SQL Server Analysis Service to perform calculations and data analysis on tabular data models.

**Importance:**

* Advanced Data Analysis
* Custom Measures & Columns
* Data Relationships
* Performance Optimization
* Enhances Power BI Reports

1. **Can you explain the difference between calculated columns and measures in Power BI?**

|  |  |  |
| --- | --- | --- |
| **Feature** | **Calculated Column** | **Measure** |
| **Definition** | Computed at the row level within a table. | Computed dynamically based on user interaction. |
| **Storage** | Physically stored in the data model, increasing file sizes | Not stored, calculated on the – fly when queried. |
| **Calculation Time** | Evaluated during data refresh. | Evaluated during report interaction. |
| **Use Case** | Useful for row-wise calculations, relationships, and filtering. | Ideal for aggregations, KPIs, and performance optimization. |

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

**Key concepts:**

* Primary & Foreign Keys
* Types of Relationships:
  + One-to-many(default)
  + Many-to-many
  + One-to-one
* Cross-Filtering Direction:
  + Single
  + Both
* DAX Function for relationships:

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

**Purpose:**

* Connects On-Premises Data
* Enables Automatic Refresh
* Ensure Data Security
* Support Multiple Services

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

**Schedule data refresh in Power BI**:

* Publish the Report
* Go to Dataset Settings
* Configure Data Gateway
* Set Refresh Frequency
* Enter Credentials
* Enable Notifications

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

**Row-Level Security (RLS) in Power BI:**

RLS is a security feature in Power BI that restricts data access at the row level based on user roles.

**How it works**:

* Define Roles
* Assign users
* Apply Filters

**Types of RLS**:

* Static RLS
* Dynamic RLS

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

|  |  |  |
| --- | --- | --- |
| **Feature** | **Power BI Desktop** | **Power BI service** |
| **Definition** | A free, standalone application for building and designing reports. | A cloud-based platform for sharing, collaborating, and scheduling refreshes. |
| **Usage** | Used for data modelling, transformations, and report creation. | Used for publishing, sharing, and online collaboration. |
| **Data Sources** | Connects to multiple data sources, including local and cloud. | Requires published datasets, mainly cloud-based connections. |
| **Data Refresh** | Manual refresh. | Automated refresh scheduling available. |
| **Collaboration** | Single-user environment. | Multi-user access with sharing and permissions. |

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

**Direct Query in Power BI:**

It is a data connectivity mode. It allows to query data directly from the source without importing it into the model.

**Key Features**:

* Real-Time Data Access
* Reduced Memory Usage
* Limited Dax & Transformations
* Performance Depends on source

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

Power BI templates are pre-designed reports or that include visualizations, queries, and data model structures but do not contain actual data.

**Useful for**:

* Reusability
* Consistency
* Time-Saving
* Customization

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

To handle incremental data refresh in Power BI:

* Enable Incremental Refresh
* Define Policy
* Partition Data
* Publish to Power BI Service
* Optimize Performance

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

Power Query in Power BI is a data transformation and preparation tool.

**Used To**:

* Connect to Data Sources
* Clean & Transform Data
* Automate Data Processing
* Enhance Data Modelling
* Ensure Data Quality

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

|  |  |  |
| --- | --- | --- |
| **Feature** | **Calculated Column** | **Calculated Table** |
| **Definition** | Adds a new column to an existing table. | Creates an entirely new table. |
| **Scope** | Works row-by-row within a table. | Works on a set of data, forming a new table. |
| **DAX Formula** | Applied at the row level using existing columns. | Uses DAX to define a new dataset. |
| **Storage** | Stored in memory, increasing model size. | Stored separately, impacting performance. |

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

**To create custom visuals in Power BI**:

* Set Up Development Environment
* Create a New Visual
* Develop the Visual
* Test the Visual
* Package the Visual
* Import to Power BI
* Publish to Marketplace

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

**Best Practices for Optimizing Performance in Power BI:**

* Optimize Data Model
* Reduce Data Size
* Optimize DAX Queries
* Improve Query Performance
* Enhance Report Performance

1. **How can you integrate Power BI with other Microsoft products like Azure and Office 365?**

**Integrating Power BI with Microsoft Products:**

* Azure Integration
* Office 365 integration
* Other Microsoft Services

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

**Key Concepts:**

* **Pre-Aggregated Data** - Summarizes large datasets
* **Optimized Storage** - Stores fewer rows, reducing memory usage.
* **Direct Query + Import Mode** - Uses a mix of detailed & aggregated data for efficiency.
* **Automatic Query Optimization** - Power BI dynamically switches between aggregated & detailed tables.

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

**Handling Errors & Ensuring Data Quality in Power BI:**

* **Error Handling in Power Query**
* **Data Quality checks**
* **Post-Import Validations**

1. **What is the purpose of Power BI Embedded and when would you use it?**

**Purpose:**

Power BI embedded is a Microsoft Azure service that allows developers to integrate Power BI reports, dashboards, and analytics into their applications, websites, or portals without users needing a power BI license.

**When to use it?**

* For ISVs & App Developers
* Customer-Facing Analytics
* White-Labelling
* Secure, Role-Based Access
* Scalable Cloud Analytics