POWER BI

INTERVIEW QUESTIONS

- by Neha Tadam

Power Query Editor

---

1. **How would you handle missing data?**
2. **How do you connect multiple data sources to a Power BI Report?**
3. **What is Import mode and Direct Mode?**
4. **Explain Merge and Append Queries in Power Query Editor.**
5. **What are the different types of data sources supported by Power BI?**
6. **How can you identify columns with missing values and check for empty values in a column using Power Query Editor?**
7. **How can you identify columns with duplicate values in Power Query Editor?**
8. **How can you handle cell errors in Power Query Editor?**
9. **How do you remove duplicate rows from a dataset in Power Query Editor?**
10. **How can you use Power Query Editor to change the data type of a column, and why is this important?**
11. **How would you reshape a dataset from individual sales transactions into a summary table showing total sales per product per month using Power Query Editor?**
12. **How would you split a column of email addresses formatted as "username@domain.com" into separate columns for username and domain using Power Query Editor?**
13. **What is "Promote Header" in Power Query?**
14. **Explain the difference between a left outer join and an inner join in Power BI.**
15. **What are the common data-shaping techniques?**
16. **What is M language?**
17. **How can two columns be combined in Power BI?**
18. **How can one change the date format in Power Query Editor?**
19. **What are the limitations of using Direct Query connection mode reports?**

One of the major limitations of Direct Query is that performance can suffer if the underlying data source is slow, as every interaction in the report sends a query to the database. Additionally, not all DAX functions are supported, and there are limits on the size and complexity of the models you can build compared to Import mode.

Data Modeling

---

1. **What do the 1, * and arrow mean in the data model diagram?**
2. **What are Fact tables and Dimension tables?**
3. **What is Cardinality?**
4. **Where is data stored in PBI?**
5. **How can we represent different levels of hierarchy**
6. **of data in one single visualization?**

7. **Difference between Star Schema and Snowflakes Schema?**
8. **Explain the difference between single and bi-directional relationships.**
9. **Explain how you would handle many-to-many relationships in a Power BI data model.**
10. **What are the different types of relationships in Power BI?**

    In Power BI, there are three main types of relationships:

    1. One-to-One: Each record in one table matches a single record in another table.
    2. One-to-Many: A single record in one table links to multiple records in another table.
    3. Many-to-Many: Multiple records in one table link to multiple records in another table, allowing for more complex data modeling.

11. **What is a Factless Fact table?**

    A Factless Fact table is a fact table that does not have any measure or metric. It's useful when you want to track events or record transactions that happen over time, but there is no numerical data to aggregate. For example, you may want to track student attendance, but you don't have any numeric data like scores or fees.

12. **What is Append, and what is the necessary condition to append queries?**

    Appending queries means combining two or more tables vertically. The necessary condition for appending is that the tables should have the same structure, meaning they should have the same number of columns and corresponding data types.

13. **What are Relationship Modifiers in Power BI?**

    Relationship modifiers in Power BI define how relationships behave between tables. They include cross-filtering directions like single and both, and options like making a relationship active or inactive. These modifiers control how data is filtered and affect the calculations in your model.

14. **What error do we get when we have many-to-many relationships between two tables?**

    In Power BI, when you have many-to-many relationships, you may encounter issues like ambiguity errors or inaccurate results. Power BI uses bidirectional cross-filtering to manage this, but it requires careful handling to avoid performance bottlenecks and logical errors in your model.

15. **How do you handle performance optimization in Power BI?**

    There are several strategies to optimize performance in Power BI, such as using aggregated tables, minimizing the use of calculated columns, avoiding bi-directional relationships, and preferring measures over calculated columns. Additionally, reducing data granularity and implementing Incremental Refresh can help with optimization.

16. **How do you handle large datasets in Power BI?**

Handling large datasets in Power BI involves using Import mode for better performance, applying Incremental Refresh, and reducing data at the source by using SQL queries or filtering at the data load level. You also want to optimize DAX queries and create aggregated views to ensure the report runs smoothly.

17. **What is the role of Hierarchies in Power BI?**

Hierarchies in Power BI allow you to group related data fields into a tree-like structure, making it easier to drill down and explore data. For example, you can create a hierarchy of Year → Quarter → Month in a date table, enabling users to analyze trends at different time levels

Charts & Reports

---

1. **What are the different types of filters in Power BI reports?**
2. **What is the difference between a slicer and a filter in Power BI?**
3. **What is the difference between a KPI and a card visualization in Power BI?**
4. **How can you create a hierarchy in Power BI?**
5. **What is the difference between a scatter chart and a bubble chart in Power BI?**
6. **Can you explain the concept of conditional formatting in Power BI?**
7. **How to set up a Custom Tooltip?**
8. **How would you ensure that a region selection on one page automatically applies to visuals on all other pages in a multi-page sales report in Power BI Desktop?**
9. **How do you set up a drill-through feature in Power BI?**
10. **What is future forecasting in Power BI, and how is it used?**
11. **What is the difference between drill down and drill through in Power BI?**
12. **How does visual interaction work in Power BI?**
13. **Explain the custom visuals in Power BI: How can they be used efficiently?**

Graphs or visuals which are not included in Power BI desktop are imported for better visualization. Such custom visuals are developed and uploaded on AppSource. This is done as community service to benefit Power BI users as they can explore new aspects of their data by using these custom visuals.

14. **Can you explain what a KPI visual is and how it is used?**

A KPI (Key Performance Indicator) visual in Power BI is used to show progress toward a measurable goal. For example, it can track sales against targets. The KPI visual uses indicators like color codes to quickly show whether the key metrics are on track, ahead, or behind.

15. **How can you change the order of the values displayed on the X-axis of a Column chart as per the requirement?**

You can change the order of values on the X-axis by sorting the axis based on a different column. For example, if you want to display months chronologically, you can create a custom column with the month numbers and sort by that column rather than the month name.

16. **What is a Decomposition Tree visual, and how is it useful?**

The Decomposition Tree visual is used for root cause analysis. It helps you break down a measure (like sales) into its contributing factors (such as region, product, or time). It is very useful

when you want to explore hierarchical data and understand the factors that contribute the most to a particular outcome.

17. How can you customize visual interaction in Power BI?

To customize visual interaction in Power BI, you can use the "Visual Interactions" feature in the Format pane. This allows you to specify how each visual should interact with other visuals in the report. For example, you can set a visual to "Highlight" mode, which will highlight the related data in other visuals, or "Filter" mode, which will filter the related data.

18. What are the different types of filters available in Power BI?

19. What is the role of bookmarks in Power BI?

Bookmarks in Power BI are used to capture the current state of a report, including filters, slicers, and the visibility of visualizations. They enable the creation of interactive reports with navigation buttons, allowing users to switch between different views or scenarios without altering the underlying data model.

20. How do you create a reset button in Power BI?

To create a reset button in Power BI, you can use a shape or an image visual and add a "Reset" action to it. The action should clear all filters and selections on the page. You can also customize the appearance of the button and add a tooltip or a description to it.

21. How do you create a drill through button in Power BI?

Answer: To create a drill through button in Power BI, you can use a shape or an image visual and add a "Drill through" action to it. The action should reference the target page or visual and the field or hierarchy to filter on. You can also customize the appearance of the button and add a tooltip or a description to it.

22. How To Use Drill Down & Drill Up In Power BI ?

Drill-down in Power BI allows users to move from a higher level of data to a more detailed level, while the drill-up feature allows users to move from a lower level of data to a higher level of data. Drill down and drill up are essential features in Microsoft Power BI that enable users to analyse data at different levels of granularity.

These features are valuable because they enable users to explore data flexibly and interactively, identify trends, patterns, and insights, and gain a deeper understanding of their data. However, using the Drill down and drill-up features effectively in power bi requires creating hierarchies in the data model and building visuals that display data at different levels of the hierarchy.

For example, if a visual displays sales data by year, the Drill down feature can be used to view the data by quarter, month, or day. Similarly, if a visual displays sales data by day, the Drill up feature can be used to view the data by month, quarter, or year. Using these features, users can quickly and easily navigate through large datasets, identify trends and patterns, and gain insights that may not be visible at a higher level.

23. Drill Down Vs. Drill Up Vs. Drill Through ?

Drill down, drill up, and drill through are three essential navigation functionalities in Power BI that allow users to explore data at different levels of granularity

Drill Down
Drill down is a function allowing users to move from a higher level of data to a more detailed level. For example, if you have a visual showing sales data by region, you can drill down to view sales data by state and city.
To use Drill Down in Power BI, click on the data point you want to explore further, then select “Drill Down” from the visualization pane or right-click on the data point and select “Drill down.”
Once you’ve selected your new level of detail, you can click on any available options for that specific region or city to see how it compares to others. You can also filter your results based on population size or sales volume criteria.

Drill Up
The Drill Up feature allows you to move from a lower level of data to a higher level of data. For example, you can drill in Power BI reports, dashboards, and other visualizations. In addition, drill-up allows users to drill down from one level of detail to another.
For example, assume you have a report that provides sales data by city and wants to show sales data by state and region. To do this, right-click the visual or chart and select “Drill up” or click the “Drill up” button in the visualizations pane.

Drill Through
Drill through is a function that allows users to access more detailed data without changing the current view. For example, if you have a visual that shows sales data by product category, you can drill through to view detailed information about a specific product without changing the view of the visual.
To use Drill Through in Power BI, you must define a drill-through action in the report. Then, users can right-click on the data point and select “Drill through” to access more detailed information.

DAX

---

1. **What is DAX in Power BI?**
2. **Explain the difference between a measure and a calculated column.**
3. **What is DAX and give us an example of recent DAX formula you've used?**
4. **What is the difference between SUM and SUMX?**
5. **How to create a Date table DAX?**
6. **How CALENDARAUTO is different from CALENDAR function?**
7. **How to keep the default total Sales even if the external users apply filter?**
8. **What does a FILTER function returns?**
9. **How do iterator function works?**
10. **What is the difference between DATEADD and SAMEPERIODLASTYEAR function?**

11. **How would you handle a scenario where you need to calculate the percentage change in sales compared to the previous year using DAX?**
12. **How can you use DAX to create a measure that calculates the average sales per customer in a dataset?**
13. **How would you use the CALCULATE function to find total sales for the current year in Power BI?**

14. **How can you differentiate between Related and Lookupvalue DAX functions?**
    The Related function is used in one-to-many relationships to pull data from a related table. It works when there's an existing relationship between the tables. On the other hand, Lookupvalue does not depend on relationships. You specify the search conditions to retrieve data from any table, even if no formal relationship exists between them.

15. **What is the difference between "Remove filters" and "Keep filters" in Power BI?**

"Remove filters" and "Keep filters" are options that allow you to control the behaviour of a DAX formula when filters are applied to a visual in Power BI. "Remove filters" will remove all filters applied to the visual, while "Keep filters" will only remove the filters that are not related to the current context of the formula.

16. **What is the difference between the ALL and ALLSELECTED functions in Power BI?**

The ALL function in Power BI removes all filters from a column or table, while the ALLSELECTED function removes all filters except for the ones that are selected in the visual. The ALLSELECTED function is useful when you want to keep some filters applied to the visual, but remove others for a specific calculation.

17. **What are time intelligence functions in Power BI?**

Time intelligence functions in Power BI are a set of DAX functions that allow you to perform calculations based on date and time values.

These functions include functions like SAMEPERIODLASTYEAR, TOTALYTD, and DATESYTD. Time intelligence functions are useful when creating reports and visualizations that require time-based calculations.

18. **What are some common time intelligence functions used in Power BI?**

Some common time intelligence functions used in Power BI include:
TOTALYTD: Calculates the year-to-date total for a measure.
DATESYTD: Calculates the year-to-date total for a column of dates.
SAMEPERIODLASTYEAR: Returns the same period from the previous year.
DATESBETWEEN: Returns a table of dates between two dates.
TOTALMTD: Calculates the month-to-date total for a measure.
LASTDATE: Returns the last date in a column or table.

These functions can be combined with other DAX functions to create more complex time-based calculations in Power BI.

19. **What does Filter context in DAX mean?**

The term “Filter Context” refers to using DAX calculations to apply filters to a set of values in columns or tables. Both implicit and explicit filter contexts exist.

20. What do you mean by Row Context?

Current rows are related to row context. The values of all the columns from the current row are included in the row context if you create a calculation using the calculated column. If there is a relationship between that table and the other table, then every related value from the other table is included for that row.

21. What is Query Context?

The final DAX query is created by combining rows and filters. This fits the definition of query context. The query context is created by DAX implicitly from the filter and row contexts that users explicitly mention for DAX.

22. What Is The Difference Between Distinct() And Values() In Dax?

Both count the distinct values, but VALUES() also counts a possible implictit virtual empty row because of non matching values in a child table. This is usually in a dimension table.

23. Explain Related() And Relatedtable()?

RELATED works when you have a row context on the table on the many side of a relationship. RELATEDTABLE works if the row context is active on the one side of a relationship. It is worth noting that both, RELATED and RELATEDTABLE, can traverse a long chain of relationships to gather their result; they are not limited to a single hop

---

Power BI Service

---

1. **Describe the process of publishing a Power BI report to the service?**
2. **What are the main differences b/w Power BI Desktop and Power BI Service?**
3. **What is the difference between Workspace and my Workspace?**
4. **What is the difference between Report and Dashboard?**
5. **What is Power BI Gateways? what are its Types?**
6. **What roles are available in Workspace?**
7. **What's the difference between a standard and a personal gateway?**
8. **How can you share a Power BI report with external users?**
9. **What type of license do I need to share a Power BI report?**
10. **What capabilities do you have with Contributor access in Power BI Service?**
11. **Can we implement RLS (Row Level Security) in Power BI?**

Yes, Row Level Security (RLS) can be implemented in Power BI to restrict data access for specific users. This is achieved by defining roles and security rules within the Power BI model, ensuring users only see the data relevant to them. For instance, sales managers should only view their region's data, not other regions.

12. How can you make sure that each category manager can see sales of their category only, and allow the CEO to see all sales in a single report? Your solution must involve minimal effort.

Configuring dynamic row-level security for managers involves least effort and a separate role for the CEO ensures full accessibility to him. Creating different reports will be a very hectic task and difficult to maintain. Slicer provides no security.

13. What is the difference between a data flow and a dataset in Power BI?

A data flow is a type of ETL tool that allows users to ingest, transform, and load data into Power BI. A dataset, on the other hand, is a collection of data that has already been ingested and transformed in Power BI. Data flows are used to create and manage the transformations required to prepare data for analysis, while datasets are used as the basis for creating reports and visualizations.

14. What is the Power BI service?

Power BI is a collection of software services, apps, and connectors that work together to help you create, share, and consume business insights in the way that serves you and your business most effectively. It connects with both On-premises and On-cloud data, which helps the user to view shared dashboards and reports through Power BI Report Server.

15. What is Power BI Report Server?

Power BI Report Server is an on-premises report server that manages reports and Key Performing with a web portal. It allows you to create different types of reports including mobile reports, paginated reports, and KPIs.
With Microsoft Intune, a cloud-based service that focuses on mobile application and device management, organizations can control items like data encryption and access pins. In this way, data handling by these applications becomes easier and more efficient. The model author with other collaborators or users can create a workspace to create reports and dashboards, which can then be shared on apps for a larger base of consumers

16. What is Scheduled refresh in Power bI?

The Scheduled refresh section is where you define the frequency and time slots to refresh the dataset. Some data sources don't require a gateway to be configurable for refresh, while other data sources require a gateway.
In a Direct Query scenario, when a dataset qualifies for performance optimization, Refresh schedule will be moved to the Optimize performance section.
Set the Keep your data up to date slider to on to configure the settings.

17. What is a Data Flow?

A dataflow is a collection of tables that are created and managed in workspaces in the Power BI service. A table is a set of columns that are used to store data, much like a table within a database. You can add and edit tables in your dataflow, and manage data refresh schedules, directly from the workspace in which your dataflow was created.

18. What is Incremental Refresh, and will you actually implement it in your Model?

Incremental refresh allows you to refresh only a subset of your data instead of reloading the entire dataset every time. Yes, I would implement it for large datasets where refreshing the full data can be time-consuming. It saves processing time and ensures that only new or updated data gets refreshed, which is essential in environments with large historical datasets.

General

---

1. **How can you optimize the performance of a Power BI report?**

1. Use Appropriate Data Types and Minimize Columns: Select the correct data types and remove unnecessary columns to streamline the data model.
2. Efficient DAX Calculations: Write efficient DAX calculations and avoid complex measures that can slow down performance.
3. Aggregations and Summary Tables: Utilize aggregations and summary tables to reduce the volume of data processed during report execution.
4. Apply Filters and Slicers: Implement filters and slicers to limit the data displayed in visualizations, enhancing performance.
5. Incremental Refresh: Use incremental refresh to update only the data that has changed, rather than refreshing the entire dataset.

These practices help in maintaining efficient, responsive, and scalable Power BI reports.

2. What is Difference between Power BI and Tableau?

Tableau is primarily a data visualization Tool, Power BI is both ETL and Data Visualization Tool ,It also has lot of data modelling options
Power BI is a tool use for easy visualization and is freely available for desktop version and can be use standalone. It has ETL tools which are similar to Excel Power Query which make it easy and comfortable It also can add external visuals to make the report attractive and interactive, Tableau is a Similar Visualization Tool but is paid version although no additional visual is needed to be added but to create the visual in tableau, it require good skill and understanding of charts and tableau tools.

3. What is ETL ?

ETL Stands for Extract Transform Load, ETL tools are used to convert raw data into structured tabular format and which records the steps performed which can be applied automatically on future loaded files.

4. Which is the ETL Component of POWERBI ?

Power Query is the ETL part of Power BI additionally the same tool is available in excel as well.

5. Describe the different components of PowerBI ?

Power BI Desktop - PowerQuery – PowerPivot – PowerView – PowerBI Service – PowerBI MobileApps, Power BI Data Flow, Power Map, Power Q&A.

6. Which are the other ETL Tools in Market ?

Informatica PowerCenter, Abinitio, Alteryx, SSIS, Spotfire, IBM DataStage, Oracle Data Integrator, SAS Data Management, Talend Open Studio, Pentaho Data Integration, Singer, Hadoop, etc.

7. What are KPIs in Power BI?

KPIs are Key Performance Indicators, which evaluate the organization's performance in distinct areas by evaluating measurable goals and values. A KPI has a measure or base value that is evaluated against target values, It helps in helping outliers stand out and give a clear vision on what is aiding the business growth.

8. What is the difference between report and Dashboard in Power BI ?

Capability	Report	Dashboard
Pages	Can be of one or more pages.	Consists of one page only
Data sources	It has a single dataset per report.	Can have data tiles from one or more datasets or reports.
Filtering	Can perform slicing, filtering, and highlighting.	Cannot filter or slice reports.
Set alerts	No option for setting alerts.	Enable setting email alerts
Featured reports	No option for creating a featured dashboard.	Enables to set only one dashboard as a featured dashboard.
Accessing tables and fields in datasets	Provides options to view dataset tables, values, and fields.	Cannot view or access underlying datasets tables and fields

Append Queries

1. **What is the purpose of appending queries in Power BI?**
    - **Answer**: Appending queries is used to combine rows from two or more tables into a single table, stacking them on top of each other. This is useful when you have similar data spread across multiple sources and want to analyze it collectively.
2. **Can you explain the difference between appending and merging queries?**
    - **Answer**: Appending queries combines rows from different tables into one table, whereas merging queries combines columns from different tables based on a common key or column.
3. **How would you append two queries with different column names in Power BI?**
    - **Answer**: You can append two queries with different column names by aligning them manually in the Power Query Editor. You need to rename columns to ensure they match or use custom transformations to align the data structure before appending.
4. **What are the steps to append queries using Power Query Editor in Power BI?**
    - **Answer**:
        1. Open Power Query Editor.
        2. Select the first query you want to append.
        3. Go to the "Home" tab and click "Append Queries".
        4. Choose to append as a new query or to an existing one.
        5. Select the queries you want to append and click "OK".
5. **Can you describe a scenario where appending queries would be useful?**
    - **Answer**: Appending queries is useful when you have monthly sales data in separate files and want to combine them into a single table for annual analysis. By appending the monthly data, you can create a comprehensive dataset for the entire year.

Merge Queries

1. **What is the purpose of merging queries in Power BI?**
    - **Answer**: Merging queries is used to combine columns from different tables based on a common key or column, similar to SQL joins. It allows you to integrate related data from different sources into a single dataset.
2. **How would you differentiate between a join and a merge in Power BI?**
    - **Answer**: A join typically refers to the SQL operation of combining data from two tables based on a common key. In Power BI, merging queries is the equivalent process, where you integrate columns from different tables using a specified key.
3. **What are the different types of joins available when merging queries?**
    - **Answer**: The types of joins available in Power BI when merging queries are:
        1. Left Outer Join
        2. Right Outer Join
        3. Full Outer Join
        4. Inner Join
        5. Anti Join (Left Anti and Right Anti)
4. **Can you explain the steps to merge two tables in Power BI using Power Query Editor?**
    - **Answer**:
        1. Open Power Query Editor.
        2. Select the first table you want to merge.
        3. Go to the "Home" tab and click "Merge Queries".
        4. Choose whether to merge into a new query or an existing one.
        5. Select the second table and the common key column(s).
        6. Choose the type of join (e.g., Left Outer, Inner).
        7. Click "OK" to complete the merge.
5. **What are some common use cases for merging queries in Power BI?**
    - **Answer**: Common use cases for merging queries include:
        1. Combining sales data with customer data to analyze customer behavior.
        2. Integrating order data with product data for detailed sales analysis.
        3. Merging employee data with department data to analyze workforce metrics.

6. **How would you handle duplicate records when merging queries?**
    - **Answer**: To handle duplicate records, you can use the "Remove Duplicates" option in the Power Query Editor before or after merging. Additionally, you can use grouping and aggregation techniques to ensure data accuracy.
7. **Can you explain what a self-join is and provide an example?**
    - **Answer**: A self-join is a merge operation where a table is joined with itself based on a related column. For example, you can perform a self-join on an employee table to find pairs of employees with the same manager.
8. **How do you ensure data integrity when merging queries in Power BI?**
    - **Answer**: Ensuring data integrity involves:
        1. Checking for and handling null or missing values.
        2. Removing or addressing duplicates.
        3. Validating the consistency of key columns used for merging.
        4. Applying necessary data transformations to align the datasets.
9. **What challenges might you encounter when merging large datasets in Power BI?**
    - **Answer**: Challenges may include:
        1. Performance issues due to large data volumes.
        2. Memory limitations leading to slow processing.
        3. Ensuring accurate data alignment and handling missing or inconsistent key values.
10. **Can you explain how to merge queries from different sources (e.g., SQL Server and Excel)?**
    - **Answer**: To merge queries from different sources, load the data from each source into Power Query Editor. Once both datasets are in the editor:
        1. Select the first dataset.
        2. Click "Merge Queries" and choose to merge with the dataset from the other source.
        3. Select the common key column(s) and the type of join.
        4. Complete the merge process and apply the changes.