1. What is Power BI?

* Power BI is a powerful business analytics tool developed by Microsoft that allows users to visualize data, create interactive reports, and share insights across an organization. It helps in transforming raw data into meaningful information through easy-to-understand visuals like charts, graphs, and dashboards. It can connect to a wide variety of data sources, such as Excel, databases, and cloud-based systems, and provide insights in real-time.

1. Power BI can connect to which data sources?

* The data source is the point from which the data has been retrieved. It can be anything like files in various formats (.xlsx, .csv, .pbix, .xml, .txt etc), databases (SQL database, SQL Data Warehouse, Spark on Azure HDInsight), or form content packets like Google Analytics or Twilio.

1. What are the available formats?
2. Power BI desktop: For the desktop version
3. Power BI mobile app: For using the visualizations on mobile OS and share it
4. Power BI services: For online SaaS
5. What are the available views?
6. Data View: Curating, exploring, and viewing data tables in the data set. Unlike, Power Query editor, with data view, you are looking at the data after it has been fed to the model.
7. Model View: This view shows you all the tables along with their complex relationships. With this, you can break these complex models into simplified diagrams or set properties for them at once.
8. Report View: The report view displays the tables in an interactive format to simplify data analysis. You can create n number of reports, provide visualizations, merge them, or apply any such functionality.
9. What are the various refresh options available?
10. Package/OneDrive refresh: This synchronizes Power BI desktop or Excel file between the Power BI service and OneDrive.
11. Data/Model refresh: This means scheduling the data import from all the sources based on either refresh schedule or on-demand.
12. Tile refresh: Refresh the tiles’ cache on the dashboard every time the data changes.
13. Visual container refresh: Update the reports’ visuals and visual container once the data changes.
14. What are the major components of Power BI?

* Power Query (for data mash-up and transformation): You can use this to extract data from various databases (like SQL Server, MySql, and many others ) and to delete a chunk of data from various sources.
* Power Pivot (for tabular data modeling): It is a data modeling engine that uses a functional language called Data Analysis Expression (DAX) to perform the calculations. Also, creates a relationship between various tables to be viewed as pivot tables.
* Power View (for viewing data visualizations): The view provides an interactive display of various data sources to extract metadata for proper data analysis.
* Power BI Desktop (a companion development tool): Power Desktop is an aggregated tool of Power Query, Power View, and Power Pivot. Create advanced queries, models, and reports using the desktop tool.
* Power BI Mobile (for Android, iOS, Windows phones): It gives an interactive display of the dashboards from the site onto these OS, effortlessly.
* Power Map (3D geo-spatial data visualization).
* Power Q&A (for natural language Q&A).

1. What is a dashboard?

* The dashboard is like a single-page canvas on which you have various elements to create and visualize reports created by analyzing data. It comprises only the most important data from the reports to create a story.
* The visual elements present on the dashboard are called Tiles. You can pin these tiles from the reports to the dashboard. Clicking any element on the dashboard takes you to the report of a particular data set.

1. What are the building blocks of Power BI?

* Datasets: Dataset is a collection of data gathered from various sources like SQL Server, Azure, Text, Oracle, XML, JSON, and many more. With the GetData feature in Power BI, we can easily fetch data from any data source.
* Visualizations: Visualization is the visual aesthetic representation of data in the form of maps, charts, or tables.
* Reports: Reports are a structured representation of datasets that consists of multiple pages. Reports help to extract important information and insights from datasets to take major business decisions.
* Dashboards: A dashboard is a single-page representation of reports made of various datasets. Each element is termed a tile.
* Tiles: Tiles are single-block containing visualizations of a report. Tiles help to differentiate each report.

1. What are content packs in Power BI?

* Content packs are packages comprising different Power BI objects such as reports, dashboards, datasets, etc. The two types of content packs are:
* Service provider content packs: Service providers such as Google Analytics, Salesforce, etc. provide pre-built content packages
* User-created content packs: Users can create their content packages and share them within the organization.

1. What is DAX?

* Data Analysis Expression (DAX) is a library of formulas used for calculations and data analysis. This library comprises functions, constants, and operators to perform calculations and give results. DAX lets you use the data sets to their full potential and provide insightful reports.
* DAX is a functional language containing conditional statements, nested functions, value references, and much more. The formulas are either numeric (integers, decimals, etc.) or non-numeric (string, binary). A DAX formula always starts with an equal sign.

1. What are the purpose and benefits of using the DAX function?

* DAX is much more than Power BI. If you learn DAX as a functional language, you become better as a data professional. DAX is based on different nested filters which magnificently improves the performance of data merging, modeling, and filtering tables.

1. What is Power Pivot?

* Power Pivot enables you to import millions of rows from heterogeneous sources of data into a single excel sheet. It lets us create relationships between the various tables, create columns, calculate using formulas, and create PivotCharts and PivotTables.
* At a time there can be only one active relationship between the tables which is represented by a continuous line.

1. What is Power Query?

* Power query is a function that filters transforms, and combines the data extracted from various sources. It helps to import data from databases, files, etc and append data

1. Difference between Power BI and Tableau?

* While Power BI uses DAX for calculating columns of a table, Tableau uses MDX (Multidimensional Expressions).
* Tableau is more efficient as it can handle a large chunk of data while Power BI can handle only a limited amount.
* Tableau is more challenging to use than Power BI.

1. What is GetData in Power BI?

* File: Excel, Text/CSV, XML, PDF, JSON, Folder, SharePoint.
* Database: SQL Server database, Access database, Oracle database, SAP HANA database, IBM, MySQL, Teradata, Impala, Amazon Redshift, Google BigQuery, etc.
* Power BI: Power BI datasets, Power BI dataflows.
* Azure: Azure SQL, Azure SQL Data Warehouse, Azure Analysis Services, Azure Data Lake, Azure Cosmos DB, etc.
* Online Services: Salesforce, Azure DevOps, Google Analytics, Adobe Analytics, Dynamics 365, Facebook, GitHub, etc.
* Others: Python script, R script, Web, Spark, Hadoop File (HDFS), ODBC, OLE DB, Active Directory, etc.

1. What are filters in Power BI?

* Filters sort data based on the condition applied to it. Filters enable us to select particular fields and extract information in a page/visualization/report level. For example, filters can provide sales reports from the year 2019 for the Indian region. Power BI can make changes based on the filters and create graphs or visuals accordingly. Types of filters are:

1. Page-level filters: These are applied on a particular page from various pages available within a report.
2. Visualization-level filters: These are applied to both data and calculation conditions for particular visualizations.
3. Report-level filters: These are applied to the entire report.
4. What are the various type of users who can use Power BI?
5. Business Users: Business users are the ones who constantly keep an eye on the reports to make important business decisions based on the insights.
6. Business Analysts: Analysts are the ones who create dashboards, reports, and visual representations of data to study the dataset properly. Studying data needs an analytical eye to capture important trends within the reports.
7. Developers: Developers are involved while creating custom visuals to create Power BI, integrating Power BI with other applications, etc.
8. Professionals: They use Power BI to check the data scalability, security, and availability of data.
9. What are the types of visualizations in Power BI?

* Visualization is a graphical representation of data. We can use visualizations to create reports and dashboards. The kinds of visualizations available in Power BI are Bar charts, Column charts, Line chart, Area chart, Stacked area chart, Ribbon chart, Waterfall chart, Scatter chart, Pie chart, Donut chart, Treemap chart, Map, Funnel chart, Gauge chart, Cards, KPI, Slicer, Table, Matrix, R script visual, Python visual, etc.

1. What do we understand by Power BI services?

* Power BI provides services for its cloud-based business analytics. With these services, you can view and share reports via the Power BI website. Power BI is a web-based service for sharing reports. Power BI service can be best referred to as PowerBI.com, PowerBI workspace, PowerBI site, or PowerBI portal.

1. What is the comprehensive working system of Power BI?

* Data Integration: The first step is to extract and integrate the data from heterogeneous data sources. After integration, the data is converted into a standard format and stored in a common area called the staging area.
* Data Processing: Once the data is assembled and integrated, it requires some cleaning up. Raw data is not so useful therefore, a few transformation and cleaning operations are performed on the data to remove redundant values, etc. After the data is transformed, it is stored in data warehouses.
* Data Presentation: Now that the data is transformed and cleaned, it is visually presented on the Power BI desktop as reports, dashboards, or scorecards. These reports can be shared via mobile apps or web to various business users

1. What are custom visuals in Power BI?

* Using Power BI visualizations, you can apply customized visualizations like charts, KPIs, etc. from the rich library of PowerBI’s custom visuals. It refrains the developers from creating it from scratch using JQuery or Javascript SDK. Once the custom visual is ready, it is tested thoroughly. Post testing, they are packaged in .pbiviz file format and shared within the organization.

1. Difference between Power Query and Power Pivot.

* Power Query: Power Query helps you import data from different sources (Excel, databases, web, etc.) and clean or transform it before using it in reports. It allows you to edit data by removing unnecessary columns, changing formats, merging tables, or applying filters. Think of it as preparing or cleaning up raw data so it’s in the right shape to work with.
* Power Pivot: Power Pivot allows you to create data models and define relationships between different tables. Once your data is clean, Power Pivot helps you organize it by linking tables, creating calculations, and making complex data analysis easier. It uses DAX (Data Analysis Expressions) to make calculations like sums, averages, or more advanced functions.

1. Mention some advantages of Power BI.

* It helps build an interactable data visualization in data centers
* It allows users to transform data into visuals and share them with anyone
* It establishes a connection for Excel queries and dashboards for fast analysis
* It provides quick and accurate solutions
* It enables users to perform queries on reports using simple English words

1. List out some drawbacks/limitations of using Power BI.

* Power BI does not accept file sizes larger than 1 GB and doesn't mix imported data accessed from real-time connections.
* There are very few data sources that allow real-time connections to Power BI reports and dashboards.
* It only shares dashboards and reports with users logged in with the same email address.
* Dashboard doesn't accept or pass user, account, or other entity parameters.

1. What is Data modelling? What are some differences in data modeling between Power BI Desktop and Power Pivot for Excel?

* Data modelling is the process of organizing and structuring data in a way that helps to create relationships between different sets of data and make it easy to analyze. In simple terms, it’s like creating a blueprint or plan for how data is stored and how different pieces of data connect to each other.
* Power Pivot for Excel supports only single directional relationships (one to many), calculated columns, and one import mode. Power BI Desktop supports bi-directional cross-filtering connections, security, calculated tables, and multiple import options.

1. What are the various types of refresh options provided in Power BI?

* Package refresh - This synchronizes your Power BI Desktop or Excel file between the Power BI service and OneDrive, or SharePoint Online.
* Model or data refresh - This refreshes the dataset within the Power BI service with data from the original data source.
* Tile refresh - This updates the cache for tile visuals every 15 minutes on the dashboard once data changes.
* Visual container refresh - This refreshes the visible container and updates the cached report visuals within a report once the data changes.

1. Explain how relationships are defined in Power BI Desktop?

* Manually - Relationships between tables are manually defined using primary and foreign keys.
* Automatic - When enabled, this automated feature of Power BI detects relationships between tables and creates them automatically.

1. Can you have more than one functional relationship between two tables in a Power Pivot data model?

* No. There can be multiple inactive relationships, but only one active relationship between two tables in a Power Pivot data model. Dotted lines represent inactive relationships, and continuous lines represent active relationships.

1. Can you have a table in the model which does not have any relationship with other tables?

* Yes. There are two main reasons why you can have disconnected tables:
  + The table is used to present the user with parameter values to be exposed and selected in slicers
  + It uses the table as a placeholder for metrics in the user interface.

1. What is the CALCULATE function in DAX?

* The CALCULATE function evaluates the sum of the Sales table Sales Amount column in a modified filter context. It is also the only function that allows users to modify the filter context of measures or tables.

1. What is row-level security?

* Row-level security limits the data a user can view and has access to, and it relies on filters. Users can define the rules and roles in Power BI Desktop and also publish them to Power BI Service to configure row-level security.

1. What are the three fundamental concepts of DAX?

* Syntax: This is how the formula is written that is, the elements that comprise it. The Syntax includes functions such as SUM (used when you want to add figures). If the Syntax isn't correct, you'll get an error message.
* Functions: These are formulas that use specific values (also known as arguments) in a particular order to perform a calculation, similar to the functions in Excel. The categories of functions are date/time, time intelligence, information, logical, mathematical, statistical, text, parent/child, and others.
* Context: There are two types: row context and filter context. Row context comes into play whenever a formula has a function that applies filters to identify a single row in a table. When one or more filters are applied in a calculation that determines a result or value, the filter context comes into play.

1. Name some commonly used tasks in the Query Editor.

* Connect to data
* Shape and combine data
* Group rows
* Pivot columns
* Create custom columns
* Query formulas

1. What do you mean by grouping?

* Power BI Desktop helps you to group the data in your visuals into chunks. You can, however, define your groups and bins. For grouping, use Ctrl + click to select multiple elements in the visual. Right-click one of those elements and, from the menu that appears, choose Group. In the Groups window, you can create new groups or modify existing ones.

1. Explain responsive slicers in Power BI.

* On a Power BI final report page, a developer can resize a responsive slicer to various sizes and shapes, and the data collected in the container will be rearranged to find a match. If a visual report becomes too small to be useful, an icon representing the visual takes its place, saving space on the report page.

1. What is query folding in Power BI?

* Query folding is used when steps defined in the Query Editor are translated into SQL and executed by the source database instead of your device. It helps with scalability and efficient processing.

1. What is "M language."?

* M is a programming language used in Power Query as a functional, case-sensitive language similar to other programming languages and easy to use.

1. How is the Schedule Refresh feature designed to work?

* Users can set up for an automatic refresh over data based on daily or weekly requirements. Users can schedule only one refresh maximum daily unless they have Power BI Pro. The Schedule Refresh section uses the pull-down menu choices to select a frequency, time zone, and time of day.

1. What gateways does Power BI have and why should you use them?

* A gateway in Power BI is a tool that allows Power BI to securely connect to data sources that are not in the cloud, like your local servers or databases. It acts as a bridge between Power BI's cloud-based services and the data stored on-premises (inside your organization’s network).
* Personal Gateway: Used only by one person, data can be imported, and is only valid on Power BI Service.
* On-Premises Gateway: This is an advanced form of the Personal Gateway, supporting Direct Query and usable by multiple users to refresh data.

1. What are KPIs in Power BI?

* KPI is abbreviated as Key Performance Indicator. Any professional organization has teams and employees follow the KPI protocols. The organizations set up KPIs for all the employees. These KPIs act as their targets. These KPIs are compared to previous performance and analyze the progress.

1. What is a Slicer?

* Slicers are an integral part of a business report generated using Power BI. The functionality of a slicer can be considered similar to that of a filter, but, unlike a filter, a Slicer can display a visual representation of all values and users will be provided with the option to select from the available values in the slicer’s drop-down menu.

1. What do you understand by Business Intelligence?

* BI, which stands for Business Intelligence, is a technology for collecting, analyzing and delivering business data to support decision-making in organizations This system uses a variety of tools, applications and practices to transform raw data organize them into valuable insights. By doing so, companies can make informed decisions, spot trends and improve their overall performance.

1. Mention the essential features of Power BI.
2. Data Import and Integration: Bring in data from various sources into one place.
3. Data Transformation: Clean and shape data to prepare it for analysis.
4. Data Modeling: Create relationships between tables and organize data for insights.
5. Interactive Dashboards and Reports: Build visually appealing and interactive reports.
6. Real-Time Data Monitoring: Get up-to-date information with live data connections.
7. Custom Visualizations: Use or add custom visuals to present data effectively.
8. Natural Language Query: Ask questions in plain English to get data insights.
9. Collaboration and Sharing: Share and collaborate on reports with others.
10. Data Security: Ensure data protection and control access to sensitive information.
11. Integration with Other Tools: Connect with Microsoft and third-party applications for a seamless experience.
12. What is the difference between Calculated Columns, Calculated Tables, and Measures?
13. Calculated Columns: Columns that you add to a table to perform calculations based on other columns in that same table. Calculated Columns are computed for each row in the table. Once created, they become part of the table and can be used like any other column. Use a Calculated Column when you need to create a new column in your table that contains values derived from existing columns.
14. Calculated Tables: Tables that you create based on a DAX formula to perform calculations or aggregate data from other tables. Calculated Tables are not part of the original data; they are generated dynamically based on the DAX formula you define. They can be used to create summary tables or to perform advanced calculations. Use a Calculated Table to create a new table from existing data, such as summarizing sales data by month or creating a table of unique values.
15. Measures: Formulas used to calculate values on the fly, based on the current context of the report or visualization. Measures are not stored in the table but are calculated dynamically based on the filters and context applied in your reports. They are used to perform aggregate calculations like sums, averages, or more complex calculations.
16. What is Power View in Power BI?

* Power View is a powerful data visualization and reporting tool first introduced as an add-on to Microsoft Excel, later added to the Power BI tool Its primary purpose is to help users visualize data and interactive and engaging reports and dashboards have been developed from a variety of sources. Power View makes it easy for users to search, browse, search and present data in an intuitive and interactive way.

1. What are the most common DAX functions used?

* Aggregation Functions: SUM, MIN, MAX, AVG, COUNTROWS, DISTINCTCOUNT
* Information Functions: ISBLANK, ISFILTERED, ISCROSSFILTERED
* Statistical Functions: GEOMEAN, MEDIAN
* Logical Functions: IF, AND, OR, SWITCH
* Date & Time Functions: DATEDIFF, DATEVALUE
* Filter Functions: VALUES, ALL, FILTER, CALCULATE, TOPN
* Other Functions: UNION, INTERSECT, EXCEPT, NATURALINNERJOIN, NATURALLEFTEROUTERJOIN,
* SUMMARIZECOLUMNS, ISEMPTY, VAR

1. What are the different connectivity modes available in Power BI?

* SQL Server Import: An SQL Server Import is the most commonly used connectivity type in Power BI, allowing full utilization of Power BI Desktop capabilities.
* Direct Query: The Direct Query connection type is only available for specific data sources. In this type, Power BI stores only the metadata of the underlying data, not the actual data.
* Live Connection: When using Live Connection, data is not stored in the Power BI model. Instead, the report interacts directly with the existing Analysis Services model. This connectivity type is only supported by three data sources: SQL Server Analysis Services (Tabular models and Multidimensional Cubes), Azure Analysis Services (Tabular Models), and Power BI Datasets hosted in the Power BI Service.

1. What is Bookmark?

* Bookmark in Power BI helps you to capture the configured view of a report page in a specific time. This includes filter and state of visual which can use a short cut to come back to the report that you can add as a bookmark.

1. What are the advantages of using a variable in Power BI?

* Variables help you to create more logical Queries and which should be used for multiple DAX functions.

1. Why use selection pane in Power BI?

* Selection Pane helps you to take control over visuals which require to be displayed and which should not be displayed. It allows you to combine multiple visual pages in the group and is also used in bookmarking.

1. State the main difference between District() and Values() in DAX?

* The only difference between two functions is that with District help you to calculate the null values.

1. State the major differences between MAX and MAXA functions.

* If you want to calculate numeric values, then use MAX. However, if it is for non numeric values, then you should use MAXA.

1. Explain the term incremental refresh?

* Increment refresh is a newly added data so that there is no need to truncate or load the entire data.

1. What kind of data can you store in Power BI?

* Fact Tables: The central table in a star schema of a data warehouse is a fact table that stores quantitative information for analysis, which is not normalized in most cases.
* Dimension Tables: It is a table in the star schema which helps you to store attributes and dimensions which describe objects that are stored in a fact table.

1. State the main difference between Filter and Slicer.

* If you are using the normal filter user cannot interact with the dashboard. On the other hand, slicer allows users to have an interaction with Reports as well as Dashboards.

1. What are the method to hide and unhide a specific report in Power BI?

* To hide and unhide specific report, you have to go to selection Pane in the menu bar, and press hides/unhide toggle button to bookmark.

1. What is CORR function? When we use it?

* CORR is a correlation function. It gives a correlation between two variables. It mostly ranges from -1 to 1.

1. State the difference between Count and CounD function.

* Count function returns to count, excluding NULL values whereas Countd returns distinct values which exclude NULL values.

1. Explain DATEDD function in Power BI.

* DATEDD function helps you to convert any input to a date format. This input can number, string, or a data type input.

1. What does DATENAME function do?

* DATENAME function shows the name of the specific part of the date that is given.

1. What is the DATEPART function?

* It returns date function as an integer. However, DATENAME function does the same thing, except it returns the name of the part of the date.

1. What does DATEDIFF function do?

* This function gives a difference between 2 dates based on the specified Date part.

1. What is the use of ENDSWITH function?

* ENDSWITH function helps you to return the logical result to the given string. In case If the sub-string is available at the end of the sub string, then it returns TRUE.

1. What is IFNULL function?

* If the value is not NULL iFNULL function result is the first expression, if it is not, then it will return the second expression.

1. What is the use of INDEX Function in Power BI?

* INDEX function helps you to retrieve the index of the respective row.

1. What is the main difference between LTRIM and RTRIM?

* LTRIM function helps you to remove the white space from the LEFT of the string. RTRIM helps you to remove it from the right the last index.

1. How can you apply percentile function in Power BI?

* PERCENTILE function allows you to returns the data value of the specific percentile number.

1. What is the use of split function?

* SPLIT function is used to split the string database on the given delimiter.

1. What is Star schema and snowflake schema?
2. Star Schema:
   * Central Fact Table: At the core, you have a central fact table that contains quantitative data (like sales amount, number of orders, etc.).
   * Dimension Tables: Surrounding the fact table are dimension tables that contain descriptive attributes related to the facts (such as date, product, customer).
   * The fact table is connected to each dimension table through foreign keys. Each dimension table is directly linked to the fact table, forming a star-like shape.
3. Snowflake Schema:
   * Central Fact Table: Similar to the Star Schema, there is a central fact table with quantitative data.
   * Normalized Dimension Tables: Dimension tables are further broken down into sub-dimension tables, creating a "snowflake" effect. This means dimension tables are normalized (split into multiple related tables).
   * The fact table is connected to dimension tables, which are further connected to sub-dimension tables. The schema resembles a snowflake due to the multiple levels of dimension tables.
4. What is Fact table and dimension table?

* Fact Table: A Fact Table is a table that contains the main data you want to analyze. It usually includes numbers and metrics that you are interested in, like sales amounts, quantities, or totals. It holds the facts of your data, which are the actual measurements or performance metrics you want to track. This table often has columns for things like IDs (unique identifiers), numerical values, and dates.
* Dimension Table: A Dimension Table is a table that provides additional details about the items in the Fact Table. It helps to describe or categorize the data. It holds descriptive information that gives context to the facts in your Fact Table. It’s used to filter or group the data in the Fact Table. This table usually contains attributes or characteristics like names, descriptions, or categories.