

Q. What is Power Bi and why is it important for businesses?

Power BI is business analytics tools developed by Microsoft that enables organizations to visualize and share insights from their data. It is important for businesses because it helps them make informed decisions based on data-driven insights, improving overall efficiency and competitiveness.

Q. Explain the main components of Power Bi?

Power Query: A data Transformation and Data Mashup Engine.

Power Pivot: A data modelling and calculation engine.

Power View: A Data Visualization Tool.

Power Map: A 3D geospatial data visualization tool.

Power Bi Service: A Cloud based platform for sharing and collaborating reports and Dashboards.

Tabular Editor: An advanced tool used with Analysis Services and Power Bi for working with tabular model it's particularly useful for enhancing data models in Power BI or SQL Server Analysis Services (SSAS).

Power BI Premium: A comprehensive, advanced cloud-based analytics service that offers dedicated cloud resources, enhanced performance, and additional features for large-scale data modelling and business intelligence.

Q. What are the different types of data sources supported by Power BI?

List of data sources that Power Bi Supports:

Relational databases (e.g., SQL Server, Oracle, MySQL)

Cloud-based services (e.g., Azure SQL Database, Salesforce, Google Analytics)

File-based sources (e.g., Excel, CSV, JSON, XML)

Web-based sources (e.g., REST APIs, OData feeds)

On-premises data sources (e.g., SharePoint, Hadoop)

Q. Explain the difference between Power BI Desktop and Power BI Service?

Power BI Desktop is a Windows-based application used for creating reports and data models, while Power BI Service is a cloud-based platform for sharing, collaborating, and publishing reports and dashboards. Power BI Desktop is primarily used by developers and web analysts, while end-users use Power BI Service to consume and interact with the reports.

Q. What is DAX, and how is it used in Power BI?

DAX (Data Analysis Expressions) is a formula language utilized in Power BI for creating calculated columns, measures, and custom tables. It is similar to Excel formulas but specifically designed to work with data models and perform advanced calculations on large datasets.

Q. Explain the difference between a calculated column and a measure in Power BI?

A calculated column is a new column added to a table in the data model, with values calculated using a DAX expression. The calculated values are stored in the data model and available for visualization. On the other hand, a measure is a dynamic calculation performed at the time of the query, based on the current context of the report or visualization. Measures are not stored in the data model but are calculated on the fly.

Q. What is the role of the Data Gateway in Power BI?

The Data Gateway is a service that helps you transfer secure data between on-premises data sources and Power BI Service. It acts as a bridge between the two, allowing Power BI to access and refresh data from on-premises sources without exposing the data source directly to the internet.

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

Power BI has three types of filters:

Visual-level filters: Applied to individual visualizations on a report page.

Page-level filters: Applied to all visualizations on a specific report page.

Report-level filters: Applied to all visualizations across the entire report.

Q. Explain the concept of data shaping in Power BI?

Data shaping is transforming and restructuring data to make it suitable for analysis and reporting. In Power BI, data shaping can be performed using Power Query, which provides a wide range of transformation functions, such as filtering, sorting, merging, appending, pivoting, and aggregating data.

Q. What is the difference between a slicer and a filter in Power BI?

A slicer is a visual element in Power BI that allows users to filter data in a report by selecting specific values or ranges. Slicers provide a more interactive and user-friendly way to filter data than traditional filters. On the other hand, filters are applied directly to the data model or individual visualizations and are not visible to the end-user.

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

Some techniques for optimizing Power BI report performance include:

Using appropriate data types and reducing the number of columns in the data model.

Creating efficient DAX calculations and avoiding complex measures.

Using aggregations and summary tables to reduce the amount of data processed.

Applying filters and slicers to limit the data displayed in visualizations.

Using incremental refresh to update only the changed data.

Q. What is the difference between DirectQuery and Import mode in Power BI?

In Import mode, data is imported into the Power BI data model and stored in memory, allowing for fast query performance and data manipulation. DirectQuery mode, on the other hand, does not store data in the data model but instead sends queries directly to the data source. This mode is helpful in working with large datasets or real-time data but may have slower query performance than Import mode.

Q. What are the different types of relationships in Power BI?

There are three types of relationships in Power BI:

One-to-one: A single record in one table corresponds to a single record in another table.

One-to-many: A single record in one table corresponds to multiple records in another table.

Many-to-many: Multiple records in one table correspond to multiple records in another table.

Q. What is the difference between a clustered and a non-clustered column chart in Power BI?

A clustered column chart displays data separately for each category, with columns grouped by the category axis. A non-clustered column chart, or a stacked column chart, displays data in a single column for each category, with segments stacked on top of each other to represent different data series.

Q. How can you create a custom visual in Power BI?

Custom visuals can be created using the Power BI Custom Visual SDK, which is based on JavaScript and D3.js. Developers can create custom visuals that extend the built-in visualization capabilities of Power BI and can be imported into reports and dashboards.

Q. What is the role of R and Python in Power BI?

R and Python can be used in Power BI for advanced data manipulation, statistical analysis, and machine learning. Power BI supports R and Python scripts in Power Query for data transformation and in the data model for creating custom columns and tables. Additionally, R and Python visuals can be added to Power BI reports for creating custom visualizations and analytical models.

Q. What is the difference between a matrix and a table visualization in Power BI?

A matrix visualization displays data in a tabular format with hierarchical row and column headers, allowing data to be grouped and summarized across multiple levels. A table visualization, on the other hand, displays data in a simple tabular format without any hierarchy or summarization.

Q. How can you share a Power BI report with external users?

There are several ways to share Power BI reports with external users, including:

Sharing a report through the Power BI Service by granting access to specific users or groups.

Publishing a report to the web, which makes it publicly accessible.

Embedding a report in a web page or application using the Power BI Embedded service.

Q. What is the difference between a dashboard and a report in Power BI?

A dashboard is a single-page collection of visualizations and key metrics designed to provide a high-level overview of the data. Dashboards are created in Power BI Service and can include visualizations from multiple reports.

On the other hand, a report is a multi-page document containing visualizations, tables, and other elements that provide detailed analysis and insights into the data. Reports are created in Power BI Desktop and can be published to Power BI Service.

Q. What is the role of themes in Power BI?

Themes in Power BI apply a consistent color scheme, font, and formatting to reports and dashboards. Themes can be applied at the report or Power BI Service levels, allowing organizations to create a consistent look and feel across all their reports and dashboards.

Q. What is the difference between a KPI and a card visualization in Power BI?

A KPI (Key Performance Indicator) visualization displays a single metric, a target value, and an indicator that shows the performance relative to the target. A card visualization, on the other hand, displays a single metric without any target or performance indicator.

Q. How can you schedule data refresh in Power BI?

Data refresh in Power BI can be scheduled using the Power BI Service. In the dataset settings, you can configure the refresh frequency (daily, weekly, etc.), the time of day, and the timezone. You can also set up email notifications for refresh failures or use the Power BI API to monitor the refresh status programmatically.

Q. What is the difference between a waterfall and funnel charts in Power BI?

A waterfall chart displays the cumulative effect of sequential positive and negative values, typically used to visualize financial data or the contribution of different factors to a total. A funnel chart, on the other hand, displays the progression of data through a series of stages or steps, typically used to visualize sales pipelines or conversion rates.

Q. 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. Bookmarks can be used to create interactive reports with navigation buttons, allowing users to switch between different views or scenarios without modifying the underlying data model.

Q. Explain the concept of row-level security in Power BI?

Row-level security (RLS) is a feature in Power BI that allows you to restrict data access for specific users based on their roles or attributes. RLS is implemented by defining DAX expressions that filter the data model based on the user's context, ensuring that users can only see the data they are authorized to access.

Q. What is the difference between a line chart and an area chart in Power BI?

A line chart displays data as points connected by straight lines, typically used to visualize trends or changes.

An area chart is similar to a line chart but fills the area between the line and the axis with color, emphasizing the magnitude of the changes. Both charts represent continuous data over a period, but area charts provide a stronger visual representation of the volume or quantity associated with the changes.

Q. How can you create a drill-through report in Power BI?

A drill-through report is created by adding a drill-through filter to a report page, which allows users to navigate from a summary visualization to a detailed view of the data.

To create a drill-through report, follow these steps:

Create a new report page for the drill-through details.

Add a drill-through filter to the page and configure the field that will be used for navigation.

Add visualizations to the drill-through page that displays the detailed data.

On the summary page, add an action to the visualization that triggers the drill-through navigation.

Q. What is the difference between a bar chart and a column chart in Power BI?

A bar chart displays data as horizontal bars, with the length of the bars representing the values. A column chart, on the other hand, displays data as vertical bars, with the height of the bars representing the values. Both charts can be used to compare data across categories, but bar charts are generally more effective for displaying data with long category labels or a large number of categories.

Q. What is the role of Q&A in Power BI?

Q&A is a natural language query feature in Power BI that allows users to ask questions related to their data and receive answers with visualizations or tables. Q&A uses machine learning and natural language processing to understand the user's intent and generate the appropriate query and visualization based on the data model.

Q. Explain the concept of data lineage in Power BI?

Data lineage is the process of tracking the flow of data from its source to its destination, including all the transformations and relationships along the way. In Power BI, data lineage can be visualized using the lineage view in Power BI Service, which shows the dependencies between datasets, reports, and dashboards. Data lineage is important for understanding the impact of changes to the data model, ensuring data quality, and troubleshooting issues.

Q. What is the difference between a pie chart and a donut chart in Power BI?

A pie chart displays data as segments of a circle, with the size of the segments representing the values. A donut chart is similar to a pie chart but has a hole in the center, creating a ring-like appearance. Both charts show the proportion of each category within a total. Still, donut charts can also display additional information in the center hole, such as a total value or a label.

Q. How can you create a hierarchy in Power BI?

Hierarchies in Power BI can be created by organizing related fields into a parent-child structure, allowing users to drill down or up through the levels of the hierarchy. To create a hierarchy, follow these steps:

In the data model, select the table containing the hierarchy fields.

Drag the parent field onto the child field to create a hierarchy.

Add additional fields to the hierarchy as needed by dragging them onto it.

Q. What is the role of the Power BI API?

The Power BI API is a RESTful web service that allows developers to programmatically interact with Power BI resources. The API can perform tasks such as creating and updating datasets, refreshing data, managing dashboards and reports, and embedding Power BI content in web applications.

Q. What is the difference between a scatter chart and a bubble chart in Power BI?

A scatter chart in Power BI displays data as a collection of points with their positions in the chart determined by the values of two variables. It's typically used to visualize the correlation between two numerical variables.

On the other hand, a bubble chart is an extension of a scatter chart that adds a third variable, represented by the size of the points (bubbles). This third variable allows a bubble chart to represent an additional dimension of data, providing more context and making it easier to understand complex relationships between variables.

Q. Explain the concept of conditional formatting in Power BI?

Conditional formatting is a feature that allows you to apply different formatting styles to data elements based on their values or other conditions. Conditional formatting can be applied to various visual elements, such as table cells, matrix cells, data bars, and color scales. Some common use cases for conditional formatting include highlighting outliers, emphasizing trends, and visualizing data quality issues.

Q. What is the role of Power BI templates, and how can they be used?

Power BI templates are pre-built report structures that include data model schema, visualizations, and formatting but without the actual data. They can standardize report designs across an organization, streamline the report creation process, and ensure consistency in branding and layout. To create a Power BI template, you can save an existing report as a template file (.pbit) and then use it as a starting point for new reports by importing the template and connecting it to the appropriate data source.

Q. Explain the concept of data profiling in Power BI?

Data profiling is examining and analyzing data to understand its structure, quality, and distribution. In Power BI, data profiling can be performed using Power Query, which provides various data profiling features such as column statistics, data type detection, and error highlighting. Data profiling is essential for identifying data quality issues, inconsistencies, and outliers, which can impact the accuracy and reliability of the analysis and reporting.

Q. What is the difference between static and dynamic segmentation in Power BI?

Static segmentation divides data into predefined segments or groups based on fixed criteria, such as age ranges or income tiers. In Power BI, static segmentation can be achieved by creating calculated columns or measures that assign each data point to a specific segment based on predefined criteria.

Dynamic segmentation, however, allows users to interactively define the segments or groups based on their specific needs or analysis requirements. In Power BI, dynamic segmentation can be implemented using slicers, filters, or DAX expressions that respond to user input and dynamically update the segments based on the selected criteria.

Q. What are the differences between Power Query and Power Pivot in Power BI?

The differences between Power Query and Power Pivot in Power BI are as follows:

Power Query:

Power Query is all about getting and transforming data.

It is an ETL (Extract, Transform, Load) service tool.

Power Pivot:

Power Pivot is all about analyzing data.

It is an in-memory data modelling component.

Q. Mention some advantages of Power BI.

It helps build an interactive 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

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

Limitations to using Power BI:

Power BI does not accept file sizes larger than 1 GB and does not 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 does not accept or pass user, account, or other entity parameters.

Q. What are some differences in data modelling between Power BI Desktop and Power Pivot for Excel?

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.

Q. Name the different connectivity modes available in Power BI?

There are three main connectivity modes used in Power BI.

SQL Server Import: -

An SQL Server Import is the default and most common connectivity type used in Power BI. It allows you to use the full capabilities of the Power BI Desktop.

Direct Query: -

The Direct Query connection type is only available when you connect to specific data sources. In this connectivity type, Power BI will only store the metadata of the underlying data and not the actual data.

Live Connection: -

With this connectivity type, it does not store data in the Power BI model. All interaction with a report using a Live Connection will directly query the existing Analysis Services model. There are only 3 data sources that support the live connection method - SQL Server Analysis Services (Tabular models and Multidimensional Cubes), Azure Analysis Services (Tabular Models), and Power BI Datasets hosted in the Power BI Service.

Q. Name the data sources that Power BI can connect to?

Several data sources can be connected to Power BI, which is grouped into three main types:

Files: -

It can import data from Excel (.xlsx, .xlsm), Power BI Desktop files (.pbix) and Comma-Separated Values (.csv).

Content Packs: -

These are a collection of related documents or files stored as a group. There are two types of content packs in Power BI:

Content packs from service providers like Google Analytics, Marketo, or Salesforce and Content packs are created and shared by other users in your organization.

Connectors: -

Connectors help you connect your databases and datasets with apps, services, and data in the cloud.

Q. What is a dashboard in Power BI?

A dashboard is a single-layer presentation sheet of multiple visualization reports. The main features of the Power BI dashboard are:

It allows you to drill through the page, bookmarks, and selection pane and also lets you create various tiles and integrate URLs.

A dashboard can also help you set report layout to mobile view.

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

Relationships between tables are defined in two ways:

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.

Q. 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.

Q. 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

Q. 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.

Q. Where is data stored in Power BI?

Most of the time, power BI gets assisted by the cloud to store the data. Power BI can use a desktop service. Microsoft Azure is used as the primary cloud service to store the data.

Azure SQL Database

Azure Blob Storage

Q. Why should you apply general formatting to Power BI data?

Users can use general formatting to make it easier for Power BI to categorize and identify data, making it considerably easier to work with.

Q. What are the different views available in Power BI Desktop?

There are three different views in Power BI, each of which serves another purpose:

Report View - In this view, users can add visualizations and additional report pages and publish the same on the portal.

Data View - In this view, data shaping can be performed using Query Editor tools.

Model View - In this view, users can manage relationships between complex datasets.

Q. What are the various versions of Power BI?

Power BI Desktop

Power BI service

Mobile Power BI apps for iOS and Android devices

Q. Explain the building blocks of Microsoft Power BI.

The important building blocks of Power BI are as follows:

Visualizations: -

Visualization is the process of generating charts and graphs for the representation of insights on business data.

Datasets: -

A dataset is the collection of data used to create a visualization, such as a column of sales figures. Dataset can get combined and filtered from a variety of sources via built-in data plugins.

Reports: -

The final stage is the report stage. Here, there is a group of visualizations on one or more pages. For example, charts and maps are combined to make a final report.

Dashboards: -

A Power BI dashboard helps you to share a single visualization with colleagues and clients to view your final dashboard.

Tiles: -

A tile is an individual visualization on your final dashboard or one of your charts in your final report.

Q. What do you mean by the content pack?

A content pack is defined as a ready-made collection of visualizations and Power BI reports using your chosen service. You'd use a content pack when you want to get up and running quickly instead of creating a report from scratch.

Q. Define bi-directional cross filtering.

Bidirectional cross-filtering lets data modelers decide how they want their Power BI Desktop filters to flow for data, using the relationships between tables. The filter context is transmitted to a second related table that exists on the other side of any given table relationship. This procedure helps data modelers solve the many-to-many issue without having to complicated DAX formulas. So, to sum it up, bidirectional cross-filtering makes the job for data modelers easier.

Q. 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.

Q. Why and how would you use a custom visual file?

You will use a custom visual file if the prepackaged files do not fit the needs of your business. Developers create custom visual files, and you can import them and use them in the same way as you would the prepackaged files.

Q. What are some familiar sources for data in the Get Data menu in Power BI?

A few familiar data sources are Excel, Power BI datasets, web, text, SQL server, and analysis services.

Q. What are the categories of data types?

All

File

Database

Power BI

Azure

Online Services

Other

Q. 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

Q. 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.

Q. 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.

Q. 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.

Q. 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.

Q. What are the major differences between visual-level, page-level, and report-level filters in Power BI?

Visual-level filters are used to filter data within a single visualization. Page-level filters are used to work on an entire page in a report, and different pages can have various filters.

Report-level filters are used to filter all the visualizations and pages in the report.

Q. List the most common techniques for data shaping.

Adding indexes

Applying a sort order

Removing columns and rows

45. 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.

Q. What information is needed to create a map in Power Map?

Power Map can display geographical visualizations. Therefore, some location data is needed—for example, city, state, country, or latitude and longitude.

Q. Which in-memory analytics engine does Power Pivot use?

Power Pivot uses the xVelocity engine. xVelocity can handle huge amounts of data, storing data in columnar databases. All data gets loaded into RAM memory when you use in-memory analytics, which boosts the processing speed.

Q. Mention important components of SSAS

Following are some of the important components of SSAS:

OLP Engine: -

An OLAP Engine is used to extensively run the ADHOC queries at a faster pace by the end-users

Data Drilling: -

It describes data Drilling in SSAS as the process of exploring details of the data with multiple levels of granularity.

Slicers: -

The data slicing process in SSAS is defined as the process of storing the data in rows and columns.

Pivot Tables: -

Pivot Tables helps in switching between the different categories of data stored between rows and columns

Q. What are the three fundamental concepts of DAX?

Syntax: This is how the formula is written—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 certain 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.

Q. Name the variety of Power BI Formats.

Power BI is available mainly in three formats, as mentioned below.

Power BI Desktop: Open-Source version for Desktop users

Power BI Services: For Online Services

Power BI Mobile Application: Compatible with mobile devices

Q. What are the different stages in the working of Power BI?

There are three different stages in working on Power BI, as explained below.

Data Integration

Data Processing

Data Presentation

Data Integration: -

The primary step in any business intelligence is to establish a successful connection with the data source and integrate it to extract data for processing.

Data Processing: -

The next step in business intelligence is data processing. Most of the time, the raw data also includes unexpected erroneous data, or sometimes a few data cells might be empty. The BI tool needs to interpret the missing values and inaccurate data for processing in the data processing stage.

Data Presentation: -

The final stage in business intelligence is analyzing the data got from the source and presenting the insights using visually appealing graphs and interactive dashboards.

Q. What is the advanced editor?

Advanced editor is used to view queries that Power BI is running against the data sources importing data. The query is rendered in M-code. Users wanting to view the query code select “Edit Queries” from the Home tab, then click on “Advanced Editor” to perform work on the query. Any changes get saved to Applied Steps in the Query Settings.

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

Gateways function as bridges between the in-house data sources and Azure Cloud Services.

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.

Q. Mention some applications of Power BI

There are multiple applications of Power BI; some of them are as follows:

Business Analysis

Data Analysis

Database Administration

IT Professional

Data Science

Q. How can you depict a story in Power BI?

Every individual chart or visualization report generated is collected and represented on a single screen. Such an approach is called a Power BI Dashboard. A Dashboard in Power BI is used to depict a story.

Q. 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.

Q. Explain Power BI Designer.

It is a combined solution offered to upload the reports and dashboards to the PowerBI.com website for reference. It consists of Power Pivot, Power Query, and Power Table.

Q. How do you reshape data in Power BI?

Power BI offers a wide variety of data source connectivity options. Data Editor is one of the tools used to manipulate rows and columns of data and helps you reshape it according to the requirements.