# Power BI Developer Interview Questions and Answers

**1. What is Power BI and why is it used?**

Answer: Power BI is a business analytics tool developed by Microsoft that enables users to visualize data, share insights across an organization, or embed them in an app or website. It is used for connecting to data sources, transforming and modeling data, creating charts and graphs, and sharing reports with others. Power BI is used because it helps in making informed business decisions based on data-driven insights.

**2. Explain the components of Power BI.**

Answer: Power BI consists of several components:

* **Power BI Desktop:** A desktop application where reports and data visualizations are created.
* **Power BI Service:** An online SaaS (Software as a Service) where reports and dashboards are published, shared, and consumed.
* **Power BI Mobile Apps:** Available for Windows, iOS, and Android devices, these apps are used to view and interact with reports and dashboards on the go.
* **Power BI Gateway:** Used to sync external data in and out of Power BI. It allows for the scheduling of data refreshes and supports live queries.
* **Power BI Report Server:** An on-premises report server where Power BI, SQL Server Reporting Services (SSRS) reports, and Excel workbooks are published and managed.

**3. What is DAX and give an example of a DAX formula?**

Answer: DAX (Data Analysis Expressions) is a collection of functions, operators, and constants that can be used in a formula or expression to calculate and return one or more values. DAX is used in Power BI, Power Pivot in Excel, and SQL Server Analysis Services Tabular models. An example of a DAX formula is the CALCULATE function, which changes the context in which a data expression is evaluated. For instance:

CALCULATE(SUM(Sales[Amount]), Sales[Year] = "2020")

This formula sums the Amount column in the Sales table, but only for the sales of the year 2020.

**4. Describe the Power Query Editor and its use.**

Answer: The Power Query Editor in Power BI is a tool used for data transformation and preparation. It allows users to connect to various data sources, filter and clean data, transform data shapes, and create custom columns and tables. The actions performed in the Power Query Editor are recorded as steps, which can be modified or deleted as needed. This tool is crucial for data preprocessing before creating reports and dashboards.

**5. What is the M language in Power BI?**

Answer: The M language, also known as the Power Query Formula Language, is the scripting language behind Power Query. It is used to programmatically access, transform, and automate data acquisition and preparation processes. M language scripts are made up of steps that apply transformations to data tables, and these scripts can be edited directly in the Advanced Editor within the Power Query Editor.

**6. Explain the difference between a measure and a calculated column in DAX.**

Answer: In DAX, a measure is a calculation used in data analysis, such as sums, averages, minimum or maximum values, which are dynamically calculated based on the filters applied to the report. Measures are not stored in the data model but are calculated at runtime. A calculated column, on the other hand, is a column that you add to an existing table in the data model, using a DAX formula that is calculated for each row.

**7. How can you optimize a Power BI report for performance?**

Answer: Optimizing a Power BI report for performance can involve several strategies:

Minimize the use of calculated columns and prefer measures where possible.

Use summarized data instead of detailed data whenever possible.

Avoid using both direct query and import modes in a single report; choose the mode best suited to your data size and source.

Limit the number of visuals on a report page, as each visual can require separate queries and calculations.

Use slicers judiciously, as they can significantly impact report performance.

**8. What are visuals in Power BI and name a few common types?**

Answer: Visuals in Power BI are the charts and graphs that represent data visually. They are used to tell stories with data, making it easier to understand trends, outliers, and patterns. Common types of visuals in Power BI include:

* Bar and column charts
* Line and area charts
* Pie and donut charts
* Scatter charts
* Waterfall charts
* Maps
* Tables and matrixes

**9. How do you manage data refresh in Power BI?**

Answer: Data refresh in Power BI can be managed in several ways:

Manual Refresh: Users can refresh their data manually in Power BI Desktop or in the Power BI service.

Scheduled Refresh: In the Power BI service, you can set up a schedule to refresh your data automatically at specified times.

Gateway Refresh: For data sources that are not accessible from the cloud (e.g., on-premises databases), a Power BI Gateway is used to facilitate the data refresh.

**10. Explain the concept of slicers in Power BI.**

Answer: Slicers in Power BI are visual filters used on reports to let end-users filter the data displayed in report visuals. Unlike page-level or report-level filters, slicers are presented as part of the report canvas and offer a more interactive and intuitive way to filter data. Users can select one or multiple items in a slicer to dynamically update the data displayed in the report visuals based on their selection.

**11. Name some important components of Power BI toolkit**

* **Power Query** – It allows to load and transform data from various sources.
* **Power Pivot** – It is a data modelling tool in Power BI.
* **Power View** – It is a presentation tool for creating tables, charts, and many more.
* **Power Map** – It allows the creation of geospatial data representations.
* **Power Q/A** –  It allows the use of natural language to get answers.

**12. Name some types of Power BI Gateway**

* **On-Premises Data Gateway** – It allows several users to connect to multiple on-premises data sources. This data gateway is suited for the scenario where multiple people access multiple data sources.
* **On-Premises Data Gateway (Private)** – It allows users to connect to sources privately. This data gateway is suited for the scenario where you don’t need to share data with others.
* **Virtual Network Gateway** – It allows multiple users to connect with multiple data sources secured by virtual networks. It is suited for complex scenarios where multiple people access multiple data sources.

**13. Name some common DAX functions**

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

# Scenario-Based DAX Formula Questions

**1. Year-over-Year Growth Calculation Scenario**

Question: You have a table named Sales with columns Date, ProductID, and SalesAmount. How would you create a DAX measure to calculate the year-over-year growth percentage of sales amount?

Answer: To calculate year-over-year growth percentage, you can use the following DAX formula:

YearOverYearGrowth =

VAR CurrentYearSales = CALCULATE(SUM(Sales[SalesAmount]), SAMEPERIODLASTYEAR('Date'[Date]))

VAR PreviousYearSales = CALCULATE(SUM(Sales[SalesAmount]), 'Date'[Date])

RETURN

IF(

NOT ISBLANK(CurrentYearSales),

(CurrentYearSales - PreviousYearSales) / PreviousYearSales

)

This formula calculates the current and previous year's sales amounts using **SAMEPERIODLASTYEAR** and then computes the growth percentage. The **IF** statement ensures that the calculation is only performed when there are sales in the current year.

**Rolling 12-Month Total Scenario**

* **Question:** Your report requires a visualization that shows a rolling 12-month total of sales. Which DAX formula would you use to create this measure in the **Sales** table?
* **Answer:** A rolling 12-month total can be calculated using the **DATESBETWEEN** and **DATEADD** functions in combination with **CALCULATE** and **SUM**:

*Rolling12MonthSales =*

*CALCULATE(*

*SUM(Sales[SalesAmount]),*

*DATESBETWEEN(*

*'Date'[Date],*

*DATEADD(LASTDATE('Date'[Date]), -12, MONTH),*

*LASTDATE('Date'[Date])*

*)*

*)*

This measure calculates the sum of **SalesAmount** for the 12 months ending on the last date in the current context.

**Dynamic Segmentation Scenario**

* **Question:** You're tasked with categorizing customers into segments based on their total purchases: "High" for purchases above $5000, "Medium" for purchases between $2000 and $5000, and "Low" for purchases below $2000. How would you write a DAX formula for this?
* **Answer:** You can use the **SWITCH** and **TRUE** functions to create a dynamic segmentation measure:

*CustomerSegment =*

*VAR TotalPurchases = SUM(Sales[SalesAmount])*

*RETURN*

*SWITCH(*

*TRUE(),*

*TotalPurchases > 5000, "High",*

*TotalPurchases >= 2000 && TotalPurchases <= 5000, "Medium",*

*"Low"*

*)*

This measure calculates the total purchases for each customer and categorizes them based on the defined thresholds.

**Calculating Average Sales Per Working Day Scenario**

* **Question:** If you need to calculate the average sales per working day in a month, assuming **Sales** table has **Date** and **SalesAmount** columns and a related **Date** table marks weekends and holidays, how would you approach this with DAX?
* **Answer:** To calculate the average sales per working day, you can use the following formula, which excludes weekends and holidays:

*AvgSalesPerWorkingDay =*

*CALCULATE(*

*AVERAGE(Sales[SalesAmount]),*

*'Date'[IsWorkingDay] = TRUE*

*)*

This assumes the **Date** table has an **IsWorkingDay** column where working days are marked as TRUE. The formula calculates the average sales amount only for those days.