**Power BI PL – 300**

* If you want to sum the sales for one year by region
  + Sales price goes in the value section
* In Power BI, if you have a table and a bar chart and you click on one item of a table, the item that it represents in the bar chart will be highlighted and the rest will be grayed out. **This is the default interactions behavior of visualizations.** If you want to change it
  + Go to Format -> Edit Interactions -> Filter.
  + This will cause the rest of the items to disappear from the bar chart instead of graying out.
* Storage Modes Power BI:
  + **Import:** default data connectivity model. Entire dataset is loaded and cached into memory. This means that once the data is imported, it does not require a live connection to the data source to interact with the visuals and reports. This enhances performance, as queries are executed directly against the cached data in Power BI.
  + **Direct Query:** This mode establishes a live connection to the data source, enabling real-time access to the most up-to-date data. Queries and calculations are sent directly to the data source, and the results are displayed in Power BI. This means that Power BI does not store a cached copy of the data, and all operations are performed in real-time against the data source. Use it for large datasets.
* Query Folding:
  + Query folding involves pushing the data transformation operations back to the data source's query language, such as SQL, rather than performing them in the Power Query Editor or Power Query engine. Do transformations in SQL rather than doing in Power Query Editor.
  + Query folding occurs when Power Query is able to translate transformation steps (filter/sort etc.) into a query or commands that can be executed directly by the data source. Instead of loading the entire dataset into Power Query and applying transformations locally, the query is sent to the data source, which performs the transformations and returns only the required data.
  + For example, let's say you have a Power Query step that filters a dataset based on a specific condition, such as filtering sales data for a specific date range. If query folding is possible, Power Query will translate that filtering operation into a SQL query and send it to the database. The database will then execute the SQL query and return only the filtered results back to Power Query.
* Query Diagnostics:
  + Selecting Diagnose Step shows you the length of time that it takes to run a step. This selection can tell you if one step takes longer to complete than others, which then serves as a starting point for further investigation.
* Pivot
  + The "Pivot" operation in Power BI allows you to rotate data from multiple rows into columns. It is useful when you have a column with distinct values that you want to convert into individual columns.
  + When you pivot data, you select a column that contains values that will become new column headers, and another column that contains corresponding values for those headers.
  + Example of Pivot: Let's say you have the following table that represents sales data for different products in different years:

|  |  |  |
| --- | --- | --- |
| Product | Year | Sales |
| Product A | 2020 | 100 |
| Product A | 2021 | 150 |
| Product B | 2020 | 200 |
| Product B | 2021 | 250 |

* You can use the Pivot operation to transform this table into a summarized format with separate columns for each year:

|  |  |  |
| --- | --- | --- |
| Product | 2020 | 2021 |
| Product A | 100 | 150 |
| Product B | 200 | 250 |

* + In this example, the "Year" column is pivoted, and new columns are created for each unique year. The values in the "Sales" column are placed under the respective year columns.
* Unpivot:
  + It allows you to transform columns into rows, converting a wide table into a long table.
  + When you unpivot data, you select one or more columns and transform them into two columns: one for the attribute names and another for the corresponding values.
  + Example of Unpivot: Let's consider the following table that represents sales data for different products, with separate columns for each year:

|  |  |  |
| --- | --- | --- |
| Product | 2020 | 2021 |
| Product A | 100 | 150 |
| Product B | 200 | 250 |

* Using the Unpivot operation, you can transform this table into a long format, where the years are consolidated into a single column:

|  |  |  |
| --- | --- | --- |
| Product | Year | Sales |
| Product A | 2020 | 100 |
| Product A | 2021 | 150 |
| Product B | 2020 | 200 |
| Product B | 2021 | 250 |

* + In this example, the columns for each year (2020 and 2021) are unpivoted, resulting in two new columns: "Year" and "Sales." Each combination of product and year now appears as a separate row in the table.
* Star Schema has one fact table and multiple dimension table
* Snowflake schema builds on Star Schema where dimension tables have lookup tables, and it keeps adding.
* Performance Analyzer:
  + It gives you the time taken for each filter/ dax query to be evaluated.
* To create a masked column for Employee ID you can create a custom column and in the formula, you can use Number.RandomBetween(1000, 9999).
* In Power BI, the relationship side that has “**One”** filters the many, the many side cannot filter the one side by default.
* You can add synonyms to the **table** for Q/A. However, detailed descriptions will not work for Q/A, they give descriptions of the columns so that the developers can better understand.
* A role label allows you to define which column best identifies a row in the table and is useful in Q/A.
* A linguistic schema describes terms and phrases that Q&A should understand for objects within a dataset, including parts of speech, synonyms, and phrasings that relate to that dataset
* Teach Q&A allows you to enter in a question in the language that someone in your organization may use such as ‘What was my stock at the end of August.’ If Power BI does not know or understand a word such as ‘stock’, you are prompted to define what ‘stock’ refers to. This way, when someone asks a similar question, Power BI will interpret the question correctly.
* If your report is slow, you can delete columns that are not used in the report. Hiding them will not improve the report's performance. You can also disable the load for queries that are not used.
* How to Run Python in Power BI – Install Python on your local machine, Install the libraries matplotlib and pandas, and enable Python scripting.
* When you hover your mouse over a column’s data preview for column quality, you can see the number and percentage of valid / error / empty cells.
* Themes are only in JSON format. All other file formats such as CSS, PNG or PDF will not work. To use a custom theme, upload a JSON theme.
* The layer order is used to control the order in which visuals are shown and is used if you have visuals that overlap.
* Use Tab order to configure the page for use with a screen reader for sight-impaired users. The layer order is used to control the order in which visuals are shown and is used if you have visuals that overlap.
* AI Insights support language detection, sentiment analysis, and key phrase extraction.
* You can set the layering order of visuals on the mobile layout canvas.
* If you’ve defined a background color for a report page, the mobile-optimized report will have the same background color.
* In the mobile layout, you can double-click the visual in the visualization pane and the visual will be added to the canvas.
* Notifications of alerts are controlled by settings in the Power BI mobile app, they cannot be configured in the Service.
* Key influencers visual is a native AI visual that helps explain correlations for a metric within the dataset.
* The Reduce number of queries sent by Query reduction setting disables the default behavior that automatically applies cross highlighting and filtering of visuals within the same report.
* Calculated Column, Column, and measures can be assigned to a display folder.
* The Data Source Settings in the Power Query interface supports editing permissions, clearing permissions, and modifying the path of the data source file.
* Any structural changes to a file, such as adding, removing, or renaming columns are not supported by the Data Source Settings in the Power Query interface.
* The storage mode of a table in Power BI Desktop is configurable from the Model view, not the Data or Report view. Page view is an option available from within the Report view.
* The top and bottom entries in Value distribution identify outliers, which appear, respectively, the greatest and the smallest number of times in that column.
* A matrix visualization displays data in two or more dimensions and cross-highlights with other visuals on the same report page.
* By default, report tooltips will apply the filter from the cross-highlighted data into the tooltip.
* The #duration function of the M language allows you to specify the datetime values that will be entered into individual rows of a date table.
* A funnel visualization displays a linear process with sequentially connected stages, with one stage transitioning to the next.

# DAX

* If you have a date column and just want parts of it (for example, year and month only) you can extract it using DAX. Example: TableName[DateColumn].Year or TableName[DateColumn].Month
* PREVIOUSYEAR is a date function that returns the previous year without the context filters such as month and days. If there are 12 months, it will give the same error for each month.
* ALL Function DAX: returns all the rows ignoring any filters that might have been applied.
* ALLEXCEPT: returns a table except for those rows that are affected by the specified column filters.
* REMOVEFILTERS: is an alias of ALL.
* ALLSELECTED: returns all the rows in a table, ignoring any filters that might have been applied inside the query but keeping the filters that come from outside.
* Calculated column can be used in Filters in this page and as an item in the slicer.
* Measures can only be placed on a visual.
* Both DAX columns and measures may be used as a visual-level filter.
* Both DAX columns and measures can be used in the drill through well.
* Quick measures are created using fields and calculations. You do not write a DAX query.
* A calculated table only duplicates data. Any model configurations such as column visibility or hierarchies must be recreated if needed.
* Time intelligence functions have performance implications and are disabled for quick measures against DirectQuery tables.
* Mathematical operations, aggregate per category, and X-functions are all supported against DirectQuery.
* DAX Studio, once connected to the data model, can be used to clear the data engine cache. The Clear Cache function can be invoked from DAX Studio, once you connect it to the data model. The Refresh Metadata function can be invoked from DAX Studio to update the metadata of the currently selected model.
* Adding a blank page to the .pbix file and selecting it is the first step in clearing the visual cache, not the data engine cache.
* End-users can change the aggregation type of implicit measure from the Values well of a visual.
* Both Implicit and Explicit measures can be used as a Drillthrough field, to create quick measures, and with Field Parameters.

# Power BI Service and Terminology

* Data Source: where your data has come from, for example, Csv, databases.
* Datasets: the actual data itself. Once it is uploaded to Power BI, it has become a dataset.
* Report: it is created from one or more datasets. A report needs either a dataset or a workbook.
* Workbooks: when you upload your own Excel workbook to the Power BI service.
* Dashboard: elements from reports. You can take visualizations from your report and add them to a Dashboard. To do it, go to the visual, and click on Pin. They can have the same dataset or a completely different dataset. Dashboards are typically a high-level overview of important information with tiles linked to specific report elements. The dashboards need the report, they are elements of reports. They can have only one page. You cannot do slicing or filters in dashboard.
* Workspace: is a container that helps you organize and manage your Power BI content, including reports, dashboards, datasets, and other related assets.
* Apps: another form of workspace, you publish it in one form, and people will see the same form people will see it until you update it. Apps are not live, workspace are live. Apps are the finished products. Power BI App is primarily designed for sharing curated content with a broader audience, including users who might not have access to the original workspaces. They are only available in the pro version.
* If you subscribe to a report, you will be notified of any changes made to the report (pro version).
* You can add a report to Power Point using Share -> Share to Power Point. It will include all the filters and will interact in the same way as it does in Power BI. You can also use an image using the export option.
* To add Row Level Security to report, go to Modeling and Manage Roles. Then you have to add a DAX expression that filters out the data and creates roles. Once it is set up on the Desktop, you have to implement it in Power BI Service otherwise no one will be able to see the report. In Service go to Security and add people’s email addresses in the roles.
* To dynamically add RLS, you can use two DAX function called
  + USERNAME(): Returns DOMAIN/USER
  + USERPRINCIPALNAME(): Returns email address.
  + Create a new column with email address based on ID, that filters out the table for example, ID =1, Owner = “someone@gmail.com”.
  + In the Manage roles create a new role and enter a formula [Owner] = userprincipalname().
* You can only set data alerts only on Gauges, KPIs, and Card Visuals.
* Update and delete workspaces – Admin.
* Publish apps – Member.
* Publish content to the workspace – Contributor.
* For lineage to work, you need to ensure you have a Power BI Pro license and you have access to the workspace. Furthermore, users must have an Admin, Member, or Contributor role in the workspace. Users with a Viewer role can't switch to lineage view.
* For streaming data, you cannot build report visuals using the data that flows in from the stream.
* To visualize a streaming dataset, add a dashboard tile then select streaming data.
* You cannot use filtering with streaming data. Since there is no underlying database, you cannot make use of report functionality such as filtering, Power BI visuals, and other report functions.
* When data classification is turned on in the tenant settings, all dashboards are given a default classification type.
* Only Admin has the permission to update workspace metadata.
* In model view, you can modify the storage mode of the dataset example Import, Direct Query.
* Two benefits of Import -> full support of Q&A and Quick Insights.
* Dividing the SQL statement into separate data sources would minimize the amount of processing on the SQL Server side. This would minimize or even eliminate the timeout issues.
* To create a custom R visual by using Power BI Desktop, you first need to install R on your computer.
* Configuring global R scripting options in Power BI Desktop might be required once you install R on your computer. Enabling the script visuals option in the Visualization pane of Power BI Desktop is done once R is installed and configured using the global R script options in Power BI Desktop.
* To use python visual, you first have to enable the script visuals option in the Visualization pane of Power BI Desktop.
* How to create a bookmark to toggle the visibility state of a visual
  + Disable the current page option.
  + Disable the data option.
  + Enable the Display option.
* A ribbon chart places the highest (ranked) value at the top of the stacked column each month and shows those ranked changes over time.
* You can configure up to eight daily time slots, if your dataset is on shared capacity, or 48 time slots on Power BI Premium.
* The Contributor role is the least privileged role that grants permissions to schedule data refreshments. The Member role grants permission to schedule data refreshes but is more privileged than Contributor.
* By default, notifications are available in the notification center. You also have the option of sending notifications via email.
* A dashboard, Microsoft Teams channel, and a report are not available as the locations of alerts.
* A certified dataset can be configured to be discoverable for users without access to request permissions to access. A promoted dataset can be configured to be discoverable for users without access to request permissions to access.
* The Workspace OneDrive setting allows you to configure a Microsoft 365 group whose SharePoint Online document library is available to workspace users once the workspace is created