1. Manage Parameters

What is it?
Parameters in Power BI are variables that you can use to modify the behavior of your reports. They can be used to filter data, change the query in Power Query, or switch between different views.

Example:
If you want to switch between different date ranges in a report (e.g., Last Week, Last Month), you can create a **Date Range Parameter** and use it in your measures or queries to dynamically change the data based on user input.

How to create it:

1. Go to **Manage Parameters** in Power BI Desktop.
2. Click **New Parameter**.
3. Set the data type (e.g., Date, Text, or Numeric).
4. Define the possible values or range for the parameter.

---

2. Merge Queries

What is it?
Merging queries in Power BI is similar to performing a **JOIN** in SQL. It allows you to combine two or more tables based on a common column (e.g., Customer ID, Product ID).

Example:
If you have a **Sales** table and a **Customer** table, you can merge them based on the **Customer ID** to combine the sales data with customer details.

Steps:

1. In Power Query, select the **Home** tab.
2. Click **Merge Queries**.
3. Select the two tables to merge.
4. Choose the column to join on (e.g., Customer ID).
5. Choose the type of join (Left, Inner, Right, Full Outer).

---

3. Append Queries

What is it?
Appending queries combines rows from multiple tables with the same structure (i.e., same columns) into one table. It's similar to the **UNION** operation in SQL.

Example:
If you have separate tables for **Sales 2023** and **Sales 2024**, you can append them into one combined table to analyze sales data across both years.

Steps:

1. In Power Query, click on **Home**.
2. Select **Append Queries**.
3. Choose the tables you want to append.

---

4. Group By

What is it?
Group By is used to summarize or aggregate data. It groups rows based on a specified column, and then you can apply aggregate functions like Sum, Average, Count, etc.

Example:
If you have a **Sales** table and want to group sales by **Product Category** and calculate the **Total Sales** for each category, you would use **Group By**.

Steps:

1. In Power Query, click on the **Transform** tab.
2. Select **Group By**.
3. Choose the column to group by (e.g., Product Category).
4. Define the aggregation (e.g., Sum of Sales).

---

5. Pivot

What is it?
Pivoting is the process of converting unique values from one column into multiple columns. It's often used to transform a dataset into a more summary-like format.

Example:
If you have a **Sales** table with columns for **Month**, **Product**, and **Sales Amount**, you can pivot the **Month** column to create separate columns for each month.

Steps:

1. In Power Query, select the column you want to pivot (e.g., Month).
2. Click **Transform**.
3. Select **Pivot Column**.
4. Choose the value column (e.g., Sales Amount) and specify the aggregation (e.g., Sum).

---

6. Unpivot

What is it?
Unpivoting is the reverse of pivoting. It converts columns back into rows, which is useful when you have columns that should be in a single column.

Example:
If you have a table with columns for **Jan**, **Feb**, and **Mar** sales, unpivoting would convert these columns into rows with one column for **Month** and another for **Sales**.

Steps:

1. In Power Query, select the columns you want to unpivot.
2. Click **Transform**.
3. Select **Unpivot Columns**.

---

7. Matrix

What is it?
A **Matrix** is a table-like visualization in Power BI that displays data in a grid with both row and column headers. It allows for hierarchical grouping and aggregating of data.

Example:
A **Sales Matrix** can show sales data with rows as **Products** and columns as **Months**, with values being the **Total Sales**.

How to create it:

1. In Power BI Desktop, click on **Matrix** from the Visualizations pane.
2. Drag fields to the Rows, Columns, and Values sections.
3. Customize the design and formatting as needed.

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8. Synchronize Slicer

What is it?
Synchronizing slicers allows you to use the same slicer (filter) across multiple report pages. This is useful if you want consistent filtering across different report views.

Example:
If you have a slicer for **Region**, synchronizing it ensures that when you select a region on one page, it automatically filters data across all pages.

Steps:

1. Select the slicer in the report.
2. Click on the **View** tab and select **Sync Slicers**.
3. Choose the pages where you want the slicer to be synced.

---

9. Slicer

What is it?
A **Slicer** is a visual element that allows users to filter data dynamically on a report. It is commonly used to filter tables or charts based on values like date, category, region, etc.

Example:
You can use a **Slicer** for selecting a **Year** or **Product Category** so that other visuals update dynamically based on the selected filter.

Steps:

1. From the Visualizations pane, choose the **Slicer** visual.
2. Drag a field (e.g., Year, Category) into the slicer.
3. Customize the slicer type (e.g., dropdown, list).

---

10. Edit Interactions

What is it?
Edit Interactions allows you to control how visuals on your report interact with each other. For example, when a user clicks on a chart, it can filter or highlight other visuals on the same report.

Example:
If you click on a specific **Product** in a bar chart, you might want a **Table** visual to show only the data for that product. You can control this interaction via the **Edit Interactions** feature.

Steps:

1. Click on the **Format** tab.
2. Select **Edit Interactions**.
3. Click on the visual you want to control interactions for, and then choose whether to **filter** or **highlight** other visuals.

11. Drill Through

What is it?
Drill Through allows users to navigate to a detailed report page filtered by specific data points selected in another report page.

Key Points:

- **Purpose:** Helps provide more detailed insights into selected data.
- **Navigation:** Adds a back button to return to the previous page.
- **Filter Fields:** Use fields as filters to pass data to the drill-through page.

Example:
If you click on a **Region** (e.g., North America) in a sales summary report, it navigates to a detailed report showing customer details, products sold, and revenue for North America.

Steps to Create Drill-Through:

1. Create a new page for the drill-through report.
2. Drag the field to the **Drill-through Filters** pane.
3. Add visuals to show detailed insights.

4. Add a **Back Button** for navigation.

---

12. Bookmarks

What is it?
Bookmarks capture the current state of a report page, including applied filters, slicers, and visuals.

Key Points:

- **Uses:** For navigation, creating dynamic reports, or saving views.
- **Types:**
  - **Static Bookmark:** Saves a fixed view.
  - **Dynamic Bookmark:** Reflects changes in slicers or filters.

Example:
A bookmark can show data for specific regions (e.g., only Asia sales) with preset slicer selections.

Steps to Use Bookmarks:

1. Set up the desired report state.
2. Go to the **View** tab, select **Bookmarks**.
3. Click **Add** and name the bookmark.

---

13. Relationship

What is it?
Relationships in Power BI link tables together based on common columns, enabling data to interact seamlessly.

Key Points:

- **Types:** One-to-Many, Many-to-One, Many-to-Many.
- **Cardinality:** Defines how data from one table relates to data in another.
- **Cross Filter Direction:**
  - **Single:** Filters flow one way.
  - **Both:** Filters flow both ways.

Example:
A **Sales** table relates to a **Product** table via a common column like **ProductID**.

Steps to Create Relationships:

1. Go to **Model** view.
2. Drag a column from one table to a related column in another.
3. Adjust the **Cardinality** and **Cross Filter Direction** if needed.

---

14. Cross Filter

What is it?
Cross Filter determines how filters from one table affect another in relationships.

Key Points:

- **Single Direction:** Filters flow only from one table to another.
- **Both Direction:** Filters can flow back and forth between tables.

Example:
In a **Sales** and **Product** relationship, a single-direction filter would allow filtering sales by product but not vice versa.

---

15. Fact and Dimension Tables

What are they?

- **Fact Table:** Contains measurable, transactional data (e.g., Sales, Revenue).
- **Dimension Table:** Contains descriptive data (e.g., Customer, Product, Region).

Key Points:

- Fact tables often have foreign keys linking to dimension tables.
- Dimension tables provide context for the facts.

Example:
A **Sales Fact Table** might have columns for DateID, ProductID, and SalesAmount, linking to a **Product Dimension Table** with ProductID and ProductName.

---

16. Schema

What is it?
Schema refers to the structure of data in a database or model.

Key Types:

- **Star Schema:** A central fact table surrounded by dimension tables.
- **Snowflake Schema:** Dimension tables are normalized into sub-dimensions.

Example:
A star schema has a **Sales Fact Table** linked directly to **Product, Customer, and Region Dimensions**.

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17. SUM vs. SUMX

- **SUM:** Aggregates values in a column.
- **SUMX:** Calculates row by row and then aggregates.

Example:

- **SUM:** `SUM(Sales[Amount])` calculates total sales amount.

- **SUMX:** `SUMX(Sales, Sales[Price] * Sales[Quantity])` calculates total revenue row by row.

---

18. COUNT, COUNTX, COUNTA

- **COUNT:** Counts non-blank values in a column.
- **COUNTX:** Counts rows in a table with an expression.
- **COUNTA:** Counts non-blank values in a column, including text.

Example:

- **COUNT:** `COUNT(Sales[OrderID])` counts non-blank orders.
- **COUNTX:** `COUNTX(Sales, Sales[Quantity] > 10)` counts rows where quantity is greater than 10.
- **COUNTA:** `COUNTA(Product[Name])` counts all product names, including blanks.

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19. Time Intelligence

What is it?
Functions in Power BI to calculate measures like YTD, MTD, or comparison over time.

Example:

- **YTD Sales:** `TOTALYTD(SUM(Sales[Amount]), Dates[Date])`
- **Last Year Sales:** `CALCULATE(SUM(Sales[Amount]), SAMEPERIODLASTYEAR(Dates[Date]))`

---

20. Dates in Between, Dates in Period

- **DATESBETWEEN:** Filters dates within a range.

```
CALCULATE(SUM(Sales[Amount]), DATESBETWEEN(Dates[Date], DATE(2023,1,1), DATE(2023,12,31)))
```

- **DATESINPERIOD:** Filters a specific time period.

```
CALCULATE(SUM(Sales[Amount]), DATESINPERIOD(Dates[Date], TODAY(), -30, DAY))
```

---

21. Gateways Difference

What is it?

- **Personal Gateway:** For single-user data refresh (installed locally).
- **Standard Gateway (Enterprise):** For multiple users and shared use in organizations.

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22. Pro vs. Premium

- **Pro:** For individual users with a subscription fee.
- **Premium:** For organizations, includes advanced features like larger data capacity, paginated reports, and AI.

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23. RLS (Row-Level Security)

What is it?
RLS restricts data access for users based on roles.

Key Points:

- Define roles in Power BI Desktop.
- Assign users to roles in Power BI Service.

Example:
A **Sales Manager** can only see sales for their region.

```
[Region] = USERPRINCIPALNAME()
```

In [ ]: