Modelling with Power BI Assignment

1. What is Power Pivot components and what are its tasks.

Power Pivot is a data modeling tool available in Excel and closely related to Power BI's data engine. It allows you to perform advanced data analysis and create complex data models with large volumes of data.

Component	Task Description
Data Model	Stores data tables, relationships, and metadata. Acts as the central storage and calculation engine.
Data View	Shows tables in a grid format, similar to Excel sheets. Used for editing and viewing data.
Diagram View	Allows visual creation and management of relationships between tables.
DAX (Data Analysis Expressions)	A formula language for creating calculated columns, measures, and KPIs.
Relationships	Connects tables through keys (usually primary to foreign keys). Enables multi-table analysis.
Calculated Columns	New data columns created using DAX formulas.
Measures	Aggregated values used in reports, also created using DAX.
KPIs (Key Performance Indicators)	Visual indicators showing performance progress based on goals.

2. What are the different views in Power BI desktop . Explain each which its working.

1. Report View

Purpose: To create and design **interactive reports and dashboards** using visualizations.

Features:

- Drag and drop fields onto the canvas.
- Use charts like bar, pie, line, cards, tables, maps, etc.
- Apply filters, slicers, and drill-through features.

Working:

- You build reports by selecting visuals and assigning data fields.
- Ideal for **presentation and storytelling** using the underlying data.

2. Data View

Purpose: To view and inspect the **actual data** that's loaded into the model.

Features:

- Shows tables, calculated columns, and data values.
- Allows creation of **calculated columns** using DAX.
- Data appears in a grid format (like Excel).

Working:

- You can verify, sort, and filter the loaded data.
- It helps in **data validation** and writing row-level DAX logic.

3. Model View

Purpose: To manage and visualize **relationships** between different tables.

Features:

- Shows all tables as blocks with their columns.
- Drag-and-drop interface to create or modify relationships.
- Set **cardinality** (one-to-one, one-to-many, etc.) and **filter direction**.

Working:

- Critical for building a **relational data model** (star schema, snowflake, etc.).
- Ensures tables are properly linked for accurate reporting.

3.What are star and snowflake schema with diagrammatical explanation.

1. Star Schema

Definition:

A **Star Schema** is a **denormalized** structure where a central **Fact Table** is connected directly to multiple **Dimension Tables**.

Characteristics:

- Fact table in the center, dimension tables around it.
- Simpler and faster to query.
- Fewer joins = better performance.
- Used in **Power BI**, **Power Pivot**, and **data warehouses** for reporting.
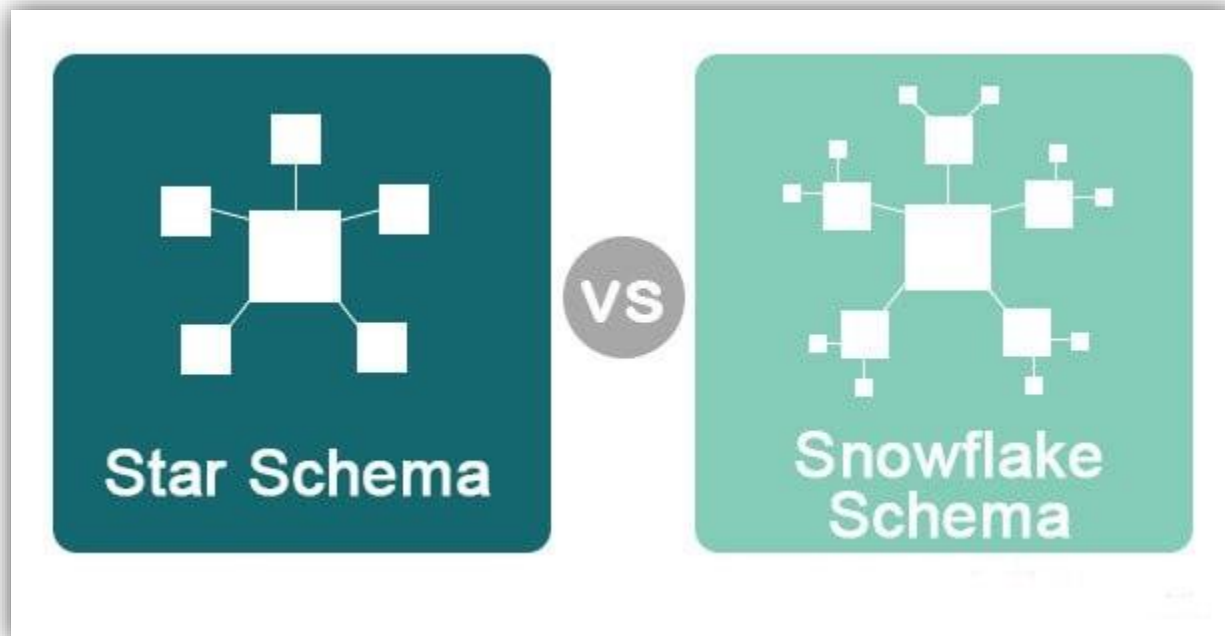
2. Snowflake Schema

Definition:

A **Snowflake Schema** is a **normalized** structure where dimension tables are split into sub-dimensions.

Characteristics:

- Dimension tables are **normalized** into related tables.
- More joins = **slower performance**, but reduces data redundancy.
- More complex than star schema.
- What is dimension and fact table.

Star Schema VS Snowflake Schema

4. What is dimension and fact table.

Fact Table

Definition: A Fact Table **contains** measurable, quantitative data **about business processes.**

Characteristics:

- Stores **numeric metrics or facts** (e.g., Sales, Profit, Quantity).
- Contains **foreign keys** that reference **dimension tables**.
- Often grows quickly in size (many rows).
- Used for **calculations, aggregations, KPIs**.

Examples of Facts:

- Sales Amount
- Order Quantity
- Profit Margin
- Revenue

DateKey	ProductID	CustomerID	StoreID	SalesAmount	Quantity
20240101	101	501	301	5000	20

Dimension Table

✔ Definition:

A **Dimension Table** contains **descriptive attributes** (text or categorical information) about the data in fact tables.

✔ Characteristics:

- Provides **context to facts** (who, what, when, where).
- Used for **filtering, grouping, and labeling** in reports.
- Usually **smaller in size**.
- Has a **primary key** that relates to the fact table's foreign key.

✔ Examples of Dimensions:

- Customer Name

- Product Category
- Region

- Date

ProductID	ProductName	Category	Brand
101	Laptop	Electronics	Dell

Feature	Fact Table	Dimension Table
Data Type	Numeric, measurable values	Descriptive, categorical information
Purpose	Analysis and aggregation	Filtering, grouping, and labeling
Contains	Foreign keys, facts	Primary keys, descriptions
Size	Large (many rows)	Smaller
Example Columns	SalesAmount, Quantity, Profit	ProductName, Category, CustomerName