Types of Data Modeling Approaches

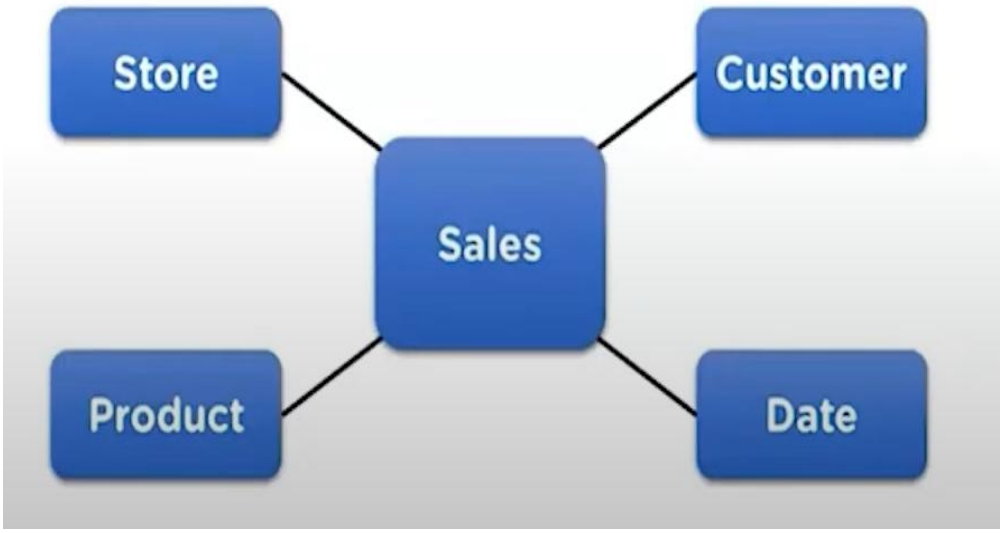
Dimensional Model (Star Schema)

- In the **Dimensional Model**, one central fact table (e.g., Sales) is connected to multiple dimension tables (e.g., Product, Customer, Store, Date).
- Used to **organize data for reporting and analytics**.
- **Fact tables** hold measurable, quantitative data (like Sales Amount).
- **Dimension tables** store descriptive information (like Product Name, Customer Name).

➢ **Power BI Usage**:

This is the most used model in Power BI, especially when building dashboards. It supports **high-performance slicing, dicing, and aggregations**.

➢ **Diagram**:

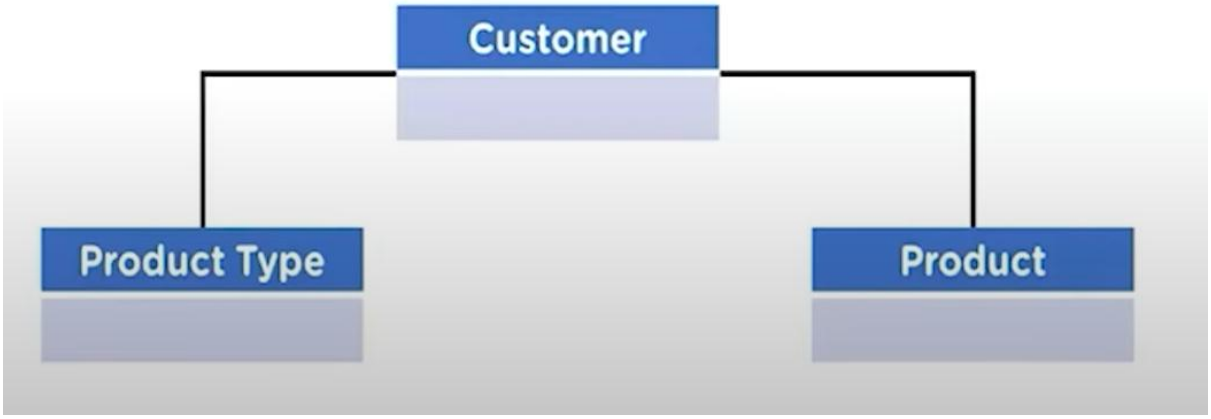


Relational Model (ER Model)

- The **Relational Model** connects tables using **foreign key and primary key relationships**.
- More normalized — data is stored in multiple related tables with fewer duplicates.
- Preferred in databases for **data integrity**.

➢ **Power BI Usage**:
Less common but useful when you need to reflect complex relationships or **filter values across many-to-many relations**.

➢ **Diagram:**



Tip:

In Power BI we need dimensional model most commonly.

Understanding Cardinality in Power BI

What is Cardinality?

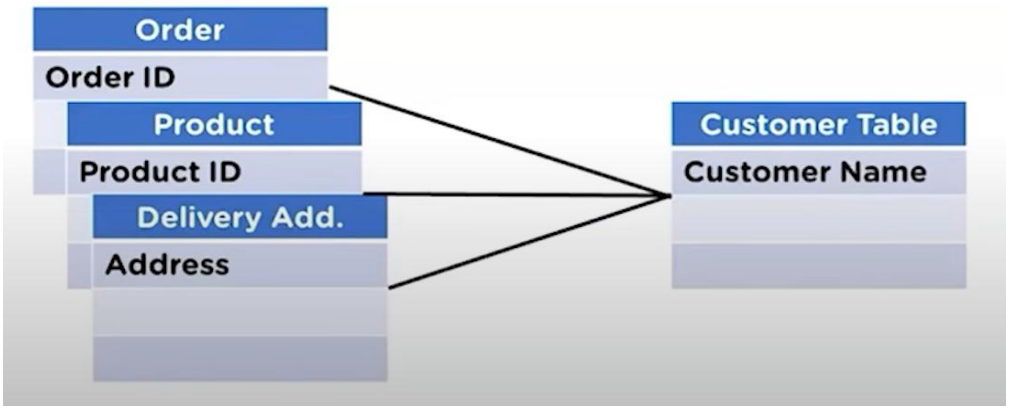
Cardinality in Power BI refers to the **type of relationship** between two tables and how many instances in one table are associated with instances in another. Correctly setting cardinality ensures **accurate joins, clean visuals**, and meaningful data analysis.

Types of Cardinality in Power BI

1. Many-to-One (* : 1)

- Many values in one table match **a single value** in another.
- Example: Many orders relate to one product.
- Most common setup in Dimensional Models.

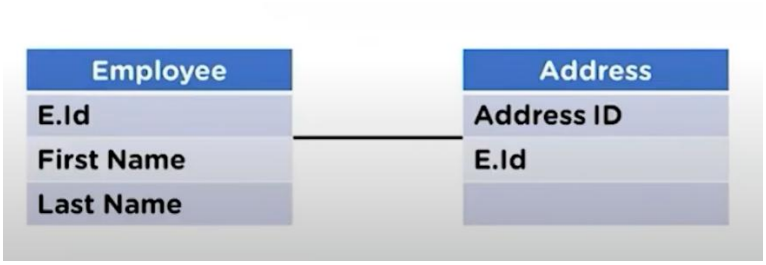
Diagram:



2. One-to-One (1 : 1)

- One value in a table matches exactly **one value** in another.
- Used in rare cases like user profiles or unique identifiers.

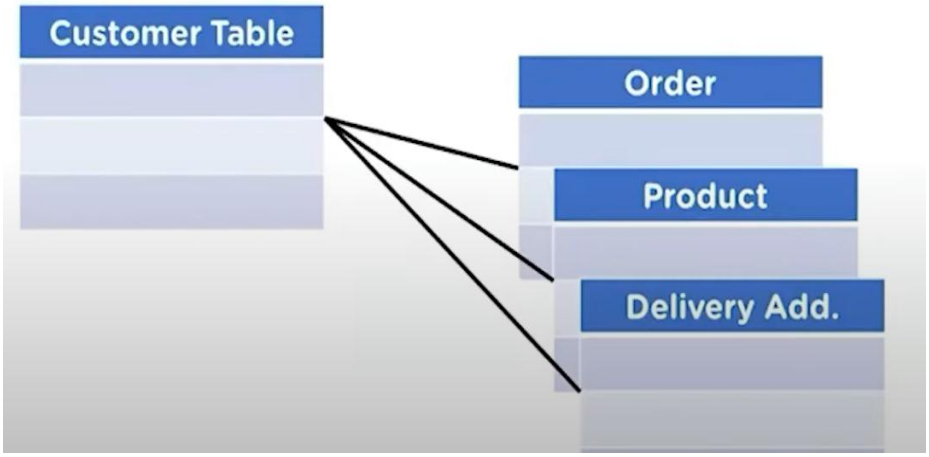
Diagram :



3. One-to-Many (1 : *)

- Reversed view of Many-to-One.
- Often means the dimension is placed on the left and fact on the right.

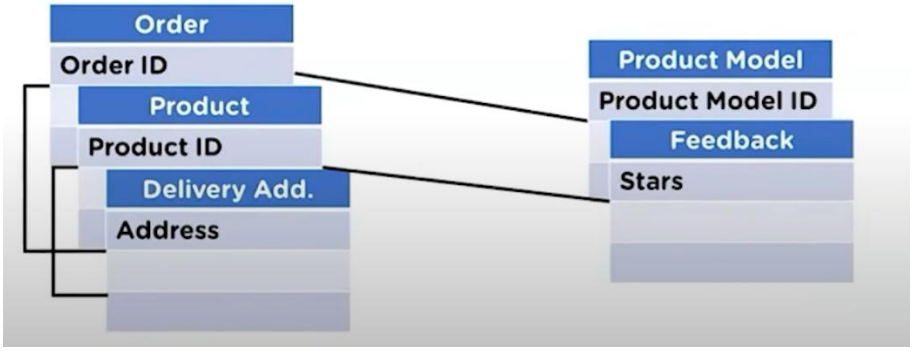
Diagram:



4. Many-to-Many (* : *)

- Both tables can have multiple matching values.
- Requires composite models or intermediate tables in Power BI.
- Example: Students and Courses.

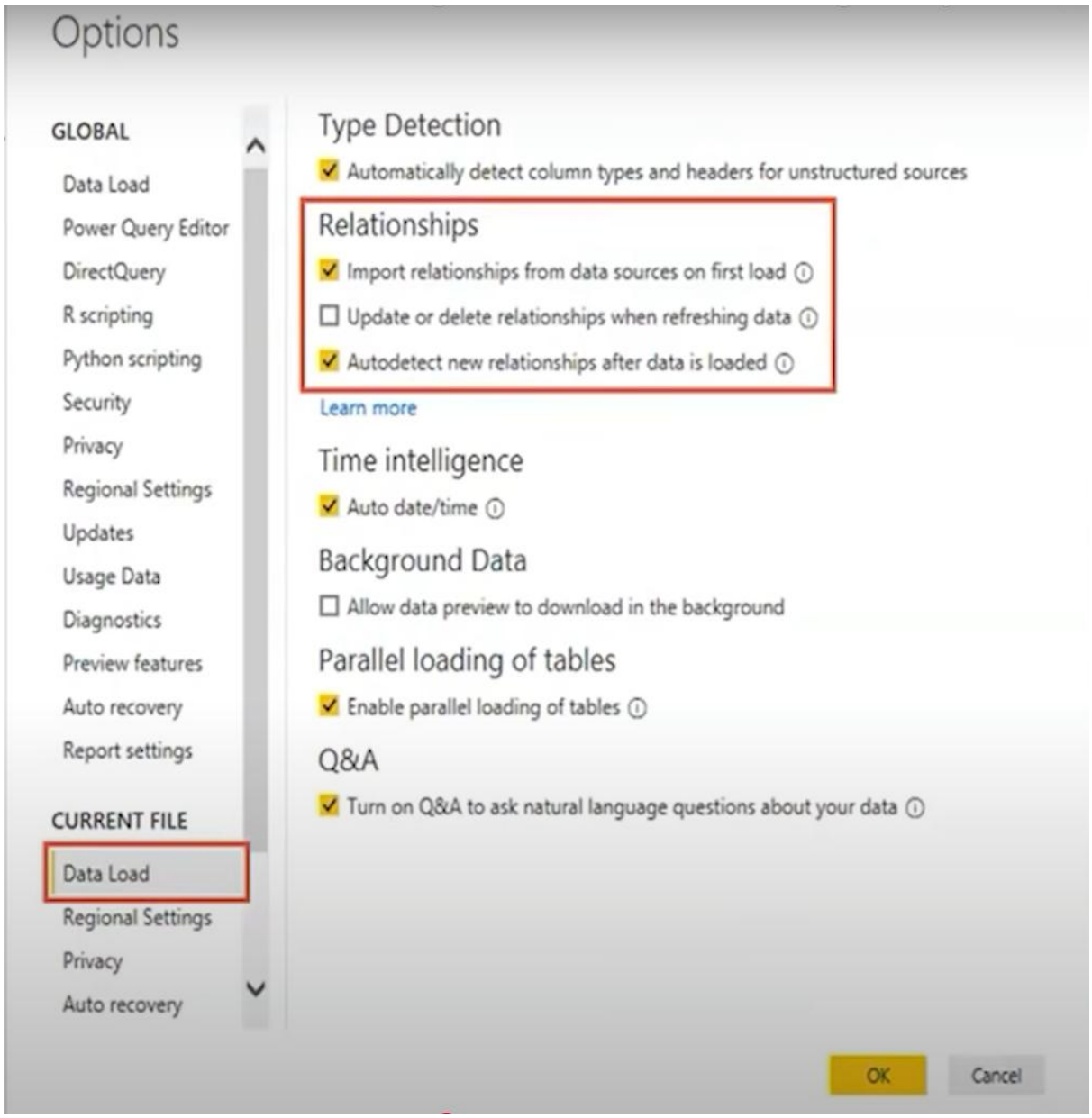
Diagram:



Auto-Detect Relationships in Power BI

- Power BI can **automatically detect relationships** based on column names and key patterns during import.
- If it finds a primary key and foreign key, it creates a relationship.
- You can view or change this in the **Model view**.

Diagram:



Tip:

Power BI performs best with the **Dimensional Model (Star Schema)** using *:1 relationships. Avoid Many-to-Many unless required.