Definition:

A **Database Diagram** in MS SQL is a visual tool that shows the structure of a database. It helps you understand how tables are related to each other, showing their columns, primary keys, foreign keys, and relationships.

Purpose of a Database Diagram:

- It helps to **visualize** the database structure.
- It makes it easier to understand how **tables are connected** (e.g., which table refers to which other table using foreign keys).
- It's a useful tool for **designing** and maintaining databases.

Example:

Let's take the **HR schema** example again, with two tables: `Employees` and `Departments`.

1. **Tables:**
   - **Employees**: This table stores employee information like `EmployeeID`, `FirstName`, `LastName`, and `DepartmentID`.
   - **Departments**: This table stores department information with `DepartmentID` and `DepartmentName`.
2. **Relationship:**
   - The `DepartmentID` column in the `Employees` table is a **foreign key** that refers to the `DepartmentID` in the `Departments` table. This relationship links each employee to a specific department.

Steps to Create a Diagram in MS SQL:

1. **Open SQL Server Management Studio (SSMS)**.
2. **Select your database**.
3. Right-click on **Database Diagrams** (under your database) and select **New Database Diagram**.
4. **Add tables** that you want to visualize.
5. The **diagram** will show tables and automatically create lines (representing foreign keys) between related tables.

Diagram Example:

- The **Employees** table will be shown with columns `EmployeeID`, `FirstName`, `LastName`, and `DepartmentID`.
- The **Departments** table will be shown with columns `DepartmentID` and `DepartmentName`.
- A line will be drawn between `DepartmentID` in both tables, showing that it's a foreign key relationship.

This visual representation helps you quickly understand how the `Employees` table is related to the `Departments` table.

Key Points in a Diagram:

- **Primary Key**: A unique identifier for a record in a table (usually underlined).
- **Foreign Key**: A column that creates a link between two tables (shown by a line).
- **Tables**: Represented as boxes with their columns.