**What is a Database ?   
A database is an organized collection of data that can be easily accessed, managed, and updated.**

**It is stored electronically using a Database Management System (DBMS) such as MySQL, Oracle, SQL Server, etc .**

**Databases are used in almost every system to store and retrieve information quickly and efficiently .**

**They are essential in schools, banks, hospitals, websites, and many more .**

**Key Characteristics of Databases :**

**Organization: Data is stored in structured tables**

**Accessibility: Data can be queried efficiently using SQL .**

**Accuracy: Helps reduce errors and duplicates .**

**Security: Access permissions can be controlled .**

**Relationships: Tables can be connected to represent logical relations (e.g., students enrolled in classes) .**

**What is Normalization ?  
  
Normalization is the process of organizing the structure of a database to minimize data redundancy and improve data integrity .**

**The main goals of normalization are :**

**To eliminate unnecessary duplication of data .**

**To avoid inconsistencies when inserting, updating, or deleting data .**

**To simplify data maintenance and improve performance .**

**Database Normalization Levels (1NF, 2NF, 3NF)**

First Normal Form (1NF)

1NF ensures that all attributes (columns) in a table contain only atomic (indivisible) values.

Each record should be unique, and there should be no repeating groups or multiple values in a single column.

Second Normal Form (2NF)

2NF builds on 1NF by requiring that all non-key attributes are fully functionally dependent on the entire primary key.

This eliminates partial dependencies, especially in tables with composite primary keys.

Third Normal Form (3NF)

3NF ensures that the table is already in 2NF, and that no non-key attribute is transitively dependent on the primary key.

In other words, non-key attributes should depend only on the primary key, and not on other non-key attributes.