

## Module - I

### *Lecture-01*

## Introduction

- What is Database?
- What is Database Management System (DBMS)?
- Database Systems

# What is Database?

- A **database** is a **structured collection of data** that is **organized, stored, and managed** in a way that enables **efficient retrieval, manipulation, and maintenance of information**.
- **Databases** are designed to handle **large volumes of data** and provide mechanisms for **storing and retrieving data** based on specific criteria.
- **Databases** are commonly used to **store various types of information**, including **text, numbers, images, videos**, and more.

# What is Database?

- Supports **relationships** between **data entities**
- Enforces **data integrity constraints**
- Allows **data** to be **queried** and **manipulated**
- Can store **various types of data**, from **simple text** to **complex multimedia**
- Used to **store data** for various **applications** and **industries**

# What is Database Management System (DBMS)?

- A **Database Management System (DBMS)** is **software** that facilitates the **creation, manipulation, and management** of **databases**.
- It acts as an **intermediary** between **users** or **applications** and the **physical data storage**, providing an **interface** through which **users** can **interact** with the **data**.
- The **DBMS** handles **tasks** related to **data organization, retrieval, security, integrity**, and more.

# What is Database Management System (DBMS)?

- A **software system** that manages **databases**.
- Provides **tools** and **interfaces** for **creating** and **modifying database structures**.
- Offers **mechanisms** for **inserting, updating, and deleting data**.
- Enforces **data integrity** rules and **constraints**.
- Handles **concurrency control** to manage **simultaneous data access**.

# What is Database Management System (DBMS)?

- Supports **query languages** (like **SQL**) for **data retrieval** and **manipulation**.
- Manages **data indexing** and **optimization** for **efficient queries**.
- Facilitates **backup**, **recovery**, and **data consistency**.
- Examples include **MySQL**, **Oracle** Database, **Microsoft SQL Server**, **PostgreSQL**, **MongoDB**, **SQLite** and more.

# What is Database Management System (DBMS)?

- In essence, a **database** is the repository of **structured data**, while a **DBMS** is the **software** that allows us to **manage, access, and manipulate** that data in a **controlled and efficient manner**.
- The **DBMS** acts as a **bridge** between **users or applications** and the underlying **data storage infrastructure**, making it easier to **interact** with and manage **large volumes of data**.

# Database Systems

- **DBMS** contains **information** about a particular **enterprise**
  - Collection of interrelated data
  - Set of programs to access the data
  - An environment that is both convenient and efficient to use
- **Database systems** are used to manage **collections of data** that are:
  - Highly valuable
  - Relatively large
  - Accessed by multiple users and applications, often at the same time.



# Database Systems

- A **modern database system** is a **complex software system** whose task is to manage a **large, complex collection of data**.
- **Databases** touch all aspects of our lives.