

-----LECTURE- I-----

[1] What is a Database?

A database is a structured electronic collection of data.

It is designed so that data can be stored, retrieved, updated, and managed easily.

You can imagine a database like a digital notebook with tables.

Each table has:

- Rows → actual records
- Columns → types of data

This structure helps users quickly search, access, update, and analyze information.

[2] What is Data?

Data means any kind of information stored inside a database, such as:

- text
- numbers
- images
- videos
- symbols
- raw facts and figures

Basically anything that can be stored and organized.

[3] What is DBMS?

A DBMS (Database Management System) is a software installed inside a server.

It works like a middleman between the user and the database.

A DBMS helps you:

- store data
- manage data
- update data

- retrieve data

It ensures everything is organized and secure.

4 Types of DBMS

Below are the 4 main types, explained in simple language:

◆ A. Hierarchical DBMS

- Stores data in a tree structure → like a family tree.
 - Uses parent–child relationships.
 - Good for one-to-many relations.
 - Not flexible for complex relationships.
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◆ B. Network DBMS

- More advanced than hierarchical.
 - A child can have multiple parents.
 - Structure looks like a graph/network.
 - Good for many-to-many relationships.
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◆ C. RDBMS (Relational DBMS) — MOST IMPORTANT

- Most commonly used today.
- Stores data in tables (rows + columns).
- Tables are linked using keys.
- Uses SQL (Structured Query Language).

Examples: MySQL, Oracle, SQL Server, PostgreSQL.

◆ D. Object-Oriented DBMS (OODBMS)

- Stores data as objects (like in programming).
- Good for complex data (images, videos, maps, multimedia).

- Used in advanced applications like scientific research, engineering, CAD.