

### Information and Data

Information refers to processed and organized data that provides context, meaning, and value

Data refers to raw and unprocessed facts and figures

Information is presented in a structured and meaningful way that can be easily understood and used

Data is typically represented in the form of numbers, text, or symbols

Information is data that has been processed, analyzed, and interpreted to provide context and meaning. It answers specific questions, addresses a particular problem, or supports decision-making.

Data is the raw material that is used to derive information. Information, on the other hand, is used to gain insights, make informed decisions, or communicate knowledge.

Information is considered valuable as it provides insights, knowledge, or answers to specific queries. Data, in its raw form, has minimal value until it is processed and transformed into meaningful information.

### DataBase Models

#### High Level

Entity-Relationship Model (ER Model) represents entities, attributes, and relationships between entities using entities, attributes, and relationships. Helps visualize the database structure and define the relationships between different entities.

#### Representational Level

is used to represent only the logical part of the database and does not represent the physical structure of the database. The representational data model allows us to focus primarily, on the design part of the database.

### DataBase Models (cont)

#### Low Level

The physical Data Model is used to practically implement Relational Data Model. Ultimately, all data in a database is stored physically on a secondary storage device. Developed for a specific version of a DBMS, location, data storage or technology to be used in the project.

### Representational Models

#### Hierarchical Model

Organizes data in a tree-like structure with a parent-child relationship. Each parent can have multiple children, but each child has only one parent.

#### Network Model

Extends the hierarchical model by allowing each child to have multiple parents. Uses a graph-like structure to represent complex relationships.

#### Relational Model

Describes data in terms of tables, where each table represents an entity or relationship. Utilizes primary keys and foreign keys to establish relationships between tables.

#### NoSQL Models

Document Model. Key-Value Model. Graph Model. Column-family DB Model

### SQL

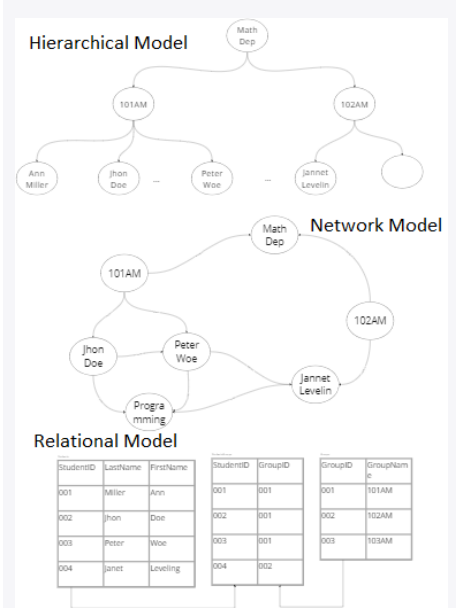
#### Structured Query Language

is a standard language for storing, manipulating and retrieving data in databases

### DBMS Architecture

- 1 Tier Arch. - the client, server, and Database all reside on the same machine.
- 2 Tier Arch. - the presentation layer runs on a client, and data is stored on a server called the second tier.
- 3 Tier Arch. - the development and maintenance of functional processes, logic, data access, data storage, and user interface is done independently as separate modules.

### Representational Models



### A database management system (DBMS)

is a computerized data-keeping system. Users of the system are given facilities to perform several kinds of operations on such a system for either manipulation of the data in the database or the management of the database structure itself