SNS COLLEGE OF TECHNOLOGY,COIMBATORE-35

(AN AUTONOMOUS INSTITUTION)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

23CST201-DATABASE MANAGEMENT SYSTEM

UNIT-I

Introduction

Database Management System:

DBMS is a collection of programs used for managing data and simultaneously it supports different types of users to create, manage, retrieve, update and store information.

Types of DBMS

The types of DBMS based on data model are as follows −

- Relational database.
- Object oriented database.
- Hierarchical database.
- Network database.

Relational database:

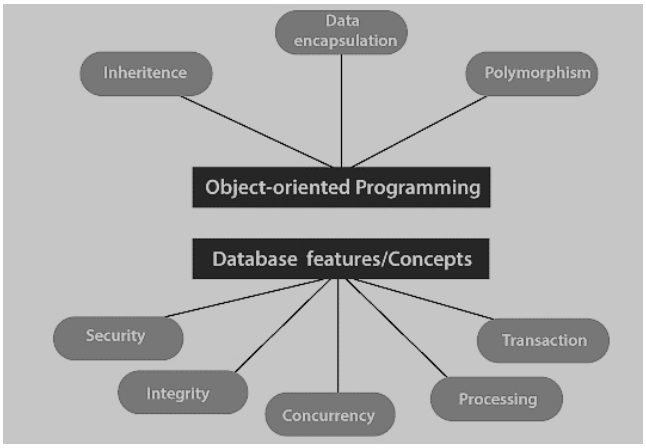
- A relational database management system (RDBMS) is a system where data is organized in two-dimensional tables using rows and columns.
- This is one of the most popular data models which is used in industries. It is based on SQL.
- Every table in a database has a key field which uniquely identifies each record.
- This type of system is the most widely used DBMS.
- Relational database management system software is available for personal computers, workstation and large mainframe systems.

Std ID	Name	City
201	Bob	Hyderabad
204	Lucky	Chennai
205	Pinky	Bangalore

Object Oriented Database

It is a system where information or data is represented in the form of objects which is used in object-oriented programming.

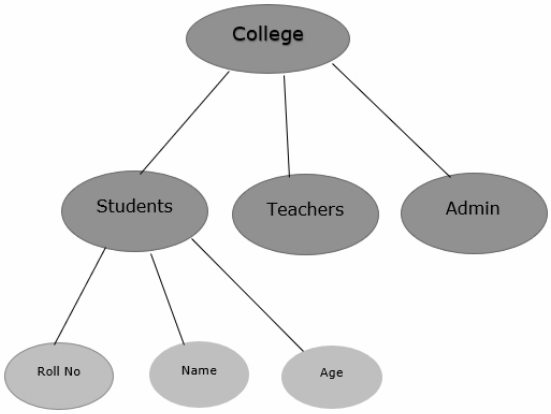
- It is a combination of relational database concepts and object-oriented principles.
- Relational database concepts are concurrency control, transactions, etc.
- OOPs principles are data encapsulation, inheritance, and polymorphism.
- It requires less code and is easy to maintain.



Hierarchical Database

It is a system where the data elements have a one to many relationship (1: N). Here data is organized like a tree which is similar to a folder structure in your computer system.

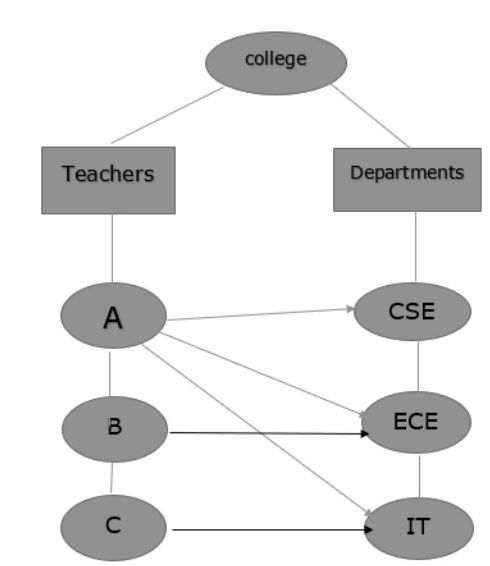
- The hierarchy starts from the root node, connecting all the child nodes to the parent node.
- It is used in industry on mainframe platforms.



Network database

A Network database management system is a system where the data elements maintain one to one relationship (1: 1) or many to many relationship (N: N).

It also has a hierarchical structure, but the data is organized like a graph and it is allowed to have more than one parent for one child record.



Three Schema Architecture:

The main objective of this architecture is to have an effective separation between the **user interface** and the **physical database**. So, the user never has to be concerned regarding the internal storage of the database and it has a simplified interaction with the database system.

The three-schema architecture defines the view of data at three levels:

1. Physical level (internal level)
2. Logical level (conceptual level)
3. View level (external level)

Physical Level:

- The physical or the internal level schema describes **how the data is stored in the hardware**.
- It also describes how the data can be accessed.
- The physical level shows the data abstraction at the lowest level and it has **complex data structures**.
- Only the database administrator operates at this level.

Logical Level/ Conceptual Level

- It is a level above the physical level. Here,

- The data is stored in the form of the **entity set**, **entities**, their **data types**, the **relationship** among the entity sets, **user operations** performed to retrieve or modify the data and certain **constraints on the data**.

- Well adding constraints to the view of data adds the security. As users are restricted to access some particular parts of the database.

- It is the developer and database administrator who operates at the logical or the conceptual level.

View Level/ User level/ External level

- It is the highest level of data abstraction and exhibits only a part of the whole database.

- It exhibits the data in which the user is interested.

- The view level can describe many views of the same data.

- The user retrieves the information using different application from the database.