25/7/24

unit-1

Overview of Database System:-

Database:-

It is a collection of large amount of data.

DBMS:-

It is a database Management system. It is a software used to manage the database. It provides an interface to perform various operations like creating, updating inserting & database. Ex:- SQL, My SQL.

Characteristics:-

→ It stores and manage all types of data.
→ It provides security for data.
→ It organise data in a structured Format.
→ It allows multiple users to access the database at a time.
→ It can handle increasing amount of data

Database Users:-

It is defined as a person who interacts with database daily. Some of the users are

1. Navie users Naive user
2. Application programmers.
3. Sophisticated user.
4. Temporary / casual user
5. Database administrator.

1. Naive user :-

They don't have any idea about database. They depends upon the application.

2. Application programmer :- User interface

There are Front-end developers. They write a programs by using high level programming language like C, C++, Java etc..

3. Sophisticated users :-

They are Back-end developers. They develop a database by using queries.

4. Temporary / casual user :-

The role of the user is to test the database.

5. Database administrator :-

A person or a term who defines the structure of the database is the database administrator.. He is responsible for performing all activities related to maintain the successful database environment.

File system	DataBase System
1. The file system is a inbuilt software that manages and organises the files in the computer.	DBMS is a user defined software that is used for managing and storing the data
2. Redundancy (Duplication) of data is present in file system	2. There is no data redundancy.

3. There is no effective query processing	3. Effective query processing is present in DBMS
4. Data is Distributed in many files so that sharing the data is not easy.	4. Due to centralized data, sharing is easy.
5. There is less data Consistency (Perfectness)	5. There is more data consistency.
6. It is less complex as compared to database systems.	6. It is more complex in handling the data when compared to file system
7. It is less expensive	7. It is more expensive.

Advantages of Database System :-

1. Controls data redundancy :-
   All the data is stored in a server so that there is no data redundancy in database.
2. Data consistency :-
   It contain some constraints (rules), so that data is consistent and accurancy.
3. Improved Data Sharing :-
   It enables multiple user to access and share data simultaneously.

4. Backup :-

It automatically backing up data to maintain its quality of data.

5. Data Security :-

It provides high security including access controls and authentication (verification).

6. Application :-

Education, hospitals, banks, railways, air lines, E-commerce, website, shoping malls, supermarkets and few more.

Data Models :-

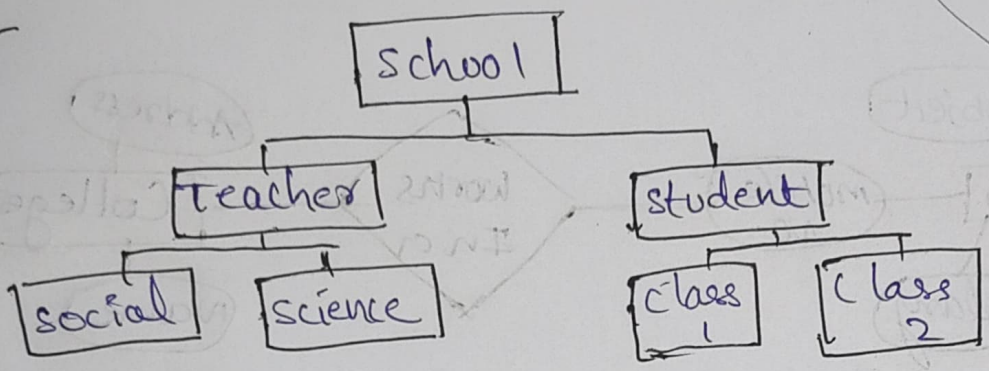
It defines the design of a database. There are 5 types of Data models.

1. Hierarichal Data model
2. Network Data model
3. Entity Relationship Data model
4. Relational Data model
5. Object oriented Data model

1. Hierarichal Data model :-

It represents the data in pre-structure. It follows one to many relationship. The condition of this Data model is one parent can contain more than one children, but one children can contain only one parent.

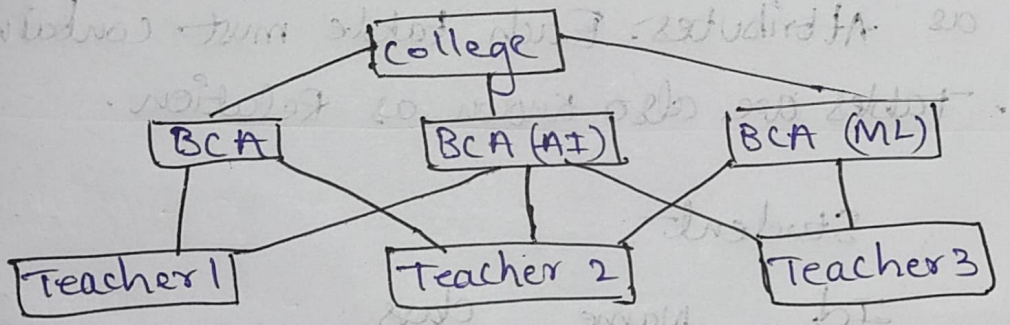
Ex:-



2. Network Data model :-

It represents the Data in graph structure. It follows many to many relationship. The condition is one parent can have more than one children and also one children can have more than one parent.

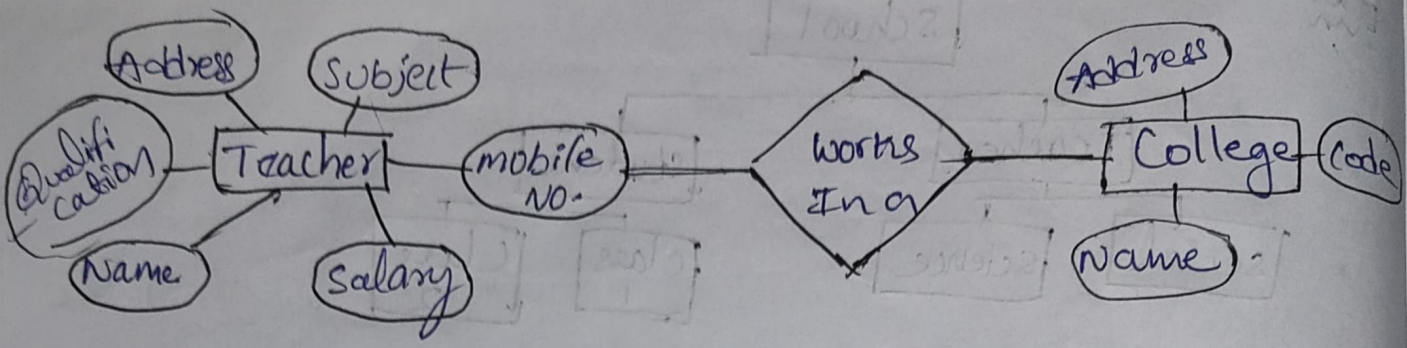
Ex:-



3. Entity Relationship Data model :-

It is also known ER Data model. It contains Entity, Attributes & Relationship. Entity is a real world object. It may be a person, place, thing etc.. It is represented in Rectangle symbol "▭". Attributes defines the properties of an entity, it is represented in ovel symbol "⬭". Relationship is used to connect the two entities, it is repre-sented in rhombus symbol "◇".

Example :-



4. Relational Data models :-

It is also known as RDBMS. The Data is represented in tables. Tables contains rows and columns. Rows are known as Tuples. Column headers are known as Attributes. Each table must contain table name. Tables are also known as Relation.

Ex :-

Student

Id	Name	class
1	Sethu	BCA
2	Harsha	BCA(AI)

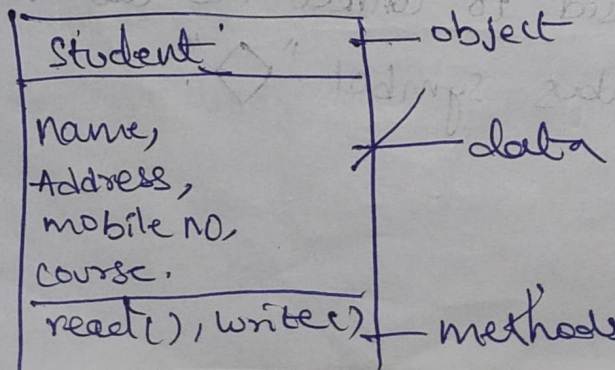
Relation

Attributes

Tuples

5. Object oriented data models :-

Object is a person, place, thing etc... Each object contains data and methods.



Instance:-

The values which are present in tuples are known as Instance.

Ex:-

student

Id	Name	age
1	sethu	18
2	Dileep	18

Attributes

Tuples

Attributes : Name, Id, age

No. of tuples : 02

Instance : 1, sethu, 18
2, Dileep, 18.

Schema:-

It is a logical representation of data model. It provides a detailed discription of a data base. It is an implementation of data model.

Data independence:-

The ability to change the schema or modify the schema is known as Data indipendence. It can be classified into 2 types they are... 1) physical Data independence 2) Logical data independence.

1) Physical Data Independence:-

It defines ability to change the physical structure of data but not affecting the application.

Ex:- changing storage locations & Devices

2) Logical Data Independence:-

The ability to change the logical structure of data but not affecting the application.

Ex:- changing table name, adding new table, removing tables etc...

3-tier Schema Architecture:-

It contains three layers they are internal layer, conceptual layer 3. External layer.

1. Internal layer:-

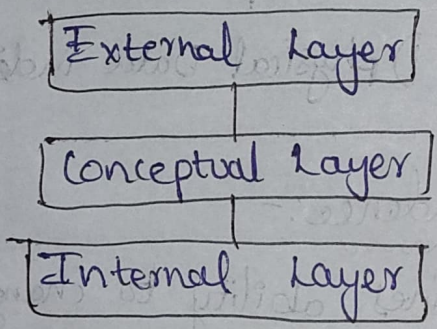
It is also known as physical layer. This layer defines the where the data is stored in our device. It includes storage locations

2. Conceptual Layer:-

It is also known as Logical layer. This layer defines what type of data is stored in a database.

3. External Layer:-

It is also know as view layer. It is an interface between user and application. It is defines how the data is viewed to the user.



Important Questions:-

1. Define database? Explain the characteristics & advantages of DBMS
2. Explain different types of database users.
3. Define data model? Explain the types of data models with Ex
4. Explain data Independence and its types.
5. Define schema? Explain the 3 tire schema architecture?