RDBMS

(Relational Database Management System)

All Modern database management system like SQL, MS SQL Server, IBM DB2, ORACLE, My-SQL and Microsoft Access are based on RDBMS. RDBMS is most commonly used database.

A Relational Database has following major components:

- Table
- Record or Tuple
- Field or Column name or Attribute
- Domain
- Instance
- Schema
- Keys

Table :- A Table is a collection of data represented in rows and columns.

Student_id	Student_Name	Student_Adr	S_Age
1001	Chaitanya	Dayalbagh, Agra	27
1002	Ajeet	Delhi	26

Record or Tuple :-

Each row of a Table is known as record. It is also known as Tuple.

Field / Column / Attribute :-

The above table "STUDENT" has four fields (or attributes):

Studen_id
Student_Name
Student_Addr
Student_Age

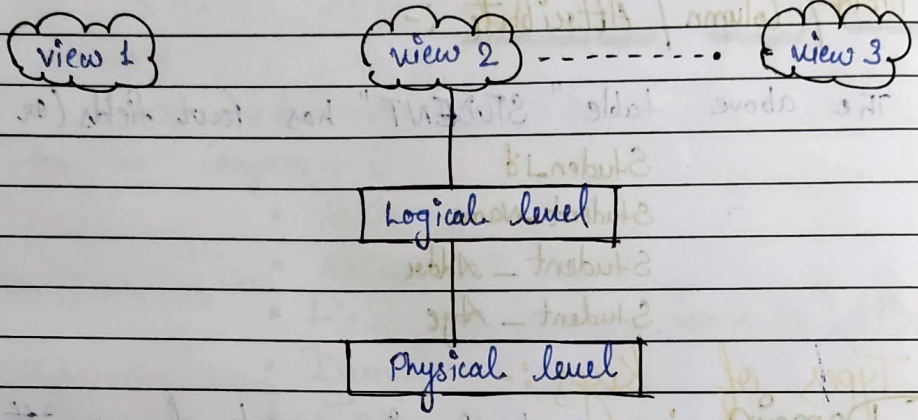
Domain :- A domain is a set of permitted values for an attribute in table.

for eg. a domain of month_of_year can accept : January, febriuary....december as values a domain of dates can accepts all possible valid dates etc.

Instance :- Instance or extension or database State is a collection of information that stored in a database at a particulare moment is called an instance of the database.

Schema :- The overall design of the database is called database schema. Schema will not change frequently. It is logical structure of a database.

"A database Schema is the skeleton structure that represents the logical view of the entire database."



Types of Schema

There are three types :

Physical Schema
logical Schema
External Schema

Physical Schema :- It is hidden below the logical schema and can be changed easily without affecting the application program.
"It is a database design at the physical level."

Logical Schema :- It is a database design at the logical level. Programmers construct applications using logical schema.

External Schema :- It is schema at view level. It is highest level of a schema which defines the views for end users.

Keys :- Keys are very important part of Relational database models. A Key can be single attribute or a group of attributes, where the combination may act as a key.

Why we need a key :-

Help you to enforce identity and integrity in the relationship.
Key help you to identify any row of the table.
Allows you to establish a relationship b/w and identify the relation b/w tables.

Types of Keys :- There are different type of keys in DBMS are :-

- Super Key
- Primary Key
- Candidate Key
- Alternate Key
- Foreign Key
- Compound/Composite Key
- Surrogate Key

Super Key :- A super Key is a group of single or multiple keys which identifies rows in a table.

Primary Key :-

PRIMARY KEY is a column or group of columns in a table that uniquely identify every row in that table.

Rules of Primary Key :-

- It cannot be double or can't two rows have same Primary Key value.
- It cannot be null.
- It must be uniquely identify (values).

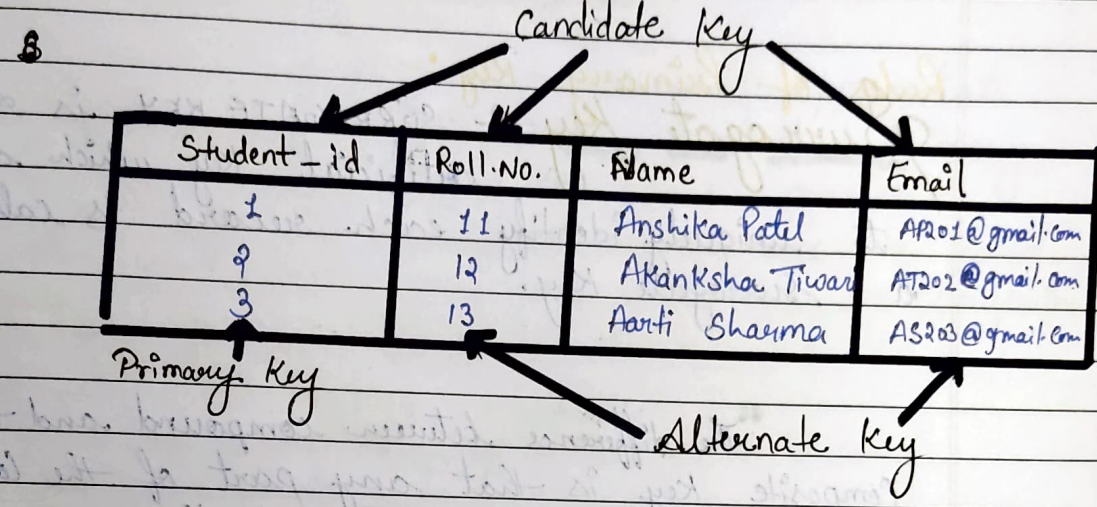
Candidate Key :-

CANDIDATE KEY in SQL is a set of attributes that uniquely identify tuples in a table.
Candidate Key is a Super key with no repeated attributes. The primary key should be selected from the Candidate Key.

Properties of Candidate Key :-

- It must contain unique value.
- Must not contain null value.
- Uniquely identify each record in a table.

Alternate Key :- All candidate key except Primary Key are called Alternate Key. It must contain uniquely identify record in a table.



Foreign Key :- FOREIGN KEY is a column that creates a relationship between two tables. It acts as a cross reference between two tables as it references the primary key of another table.

Compound Key :- COMPOUND KEY has two or more attributes that allow you to uniquely recognize a specific record.

Composite Key :- COMPOSITE KEY is a combination of two or more columns that uniquely identify rows in a table.

Surrogate Key :- SURROGATE KEY is an artificial key which aims to uniquely identify each record is called a Surrogate Key.

"The difference between compound and the Composite Key is that any part of the Compound Key can be a foreign key, but the composite key may or maybe not a part of the Foreign Key."

Shantanu