RDBMS

RDBMS stands for *Relational Database Management Systems.*.

All modern database management systems like SQL, MS SQL Server, IBM DB2, ORACLE, My-SQL and Microsoft Access are based on RDBMS.

It is called Relational Data Base Management System (RDBMS) because it is based on relational model introduced by E.F. Codd.

RDMS Terminologies include Database, Table, Columns, etc. Let us see them one by one −

Database

Database is a collection of tables like <Student>, <Professors>, etc.

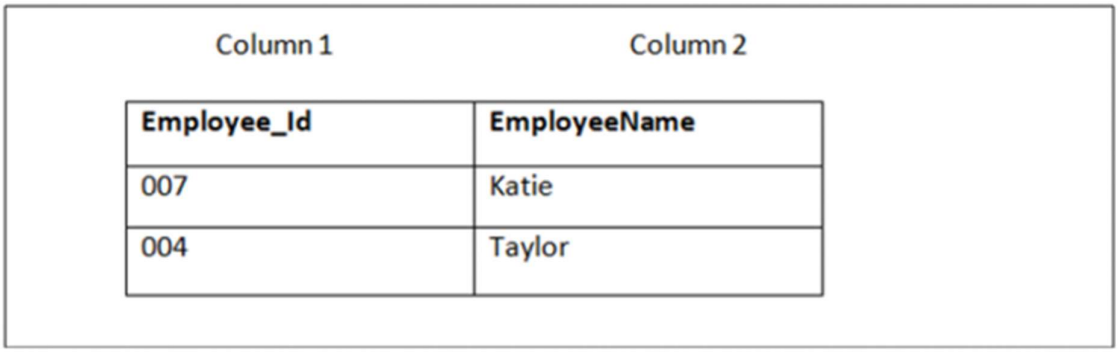
Table

A table is a collection of rows and columns , for example,

StudentId	StudentName	StudentRank
052	Tom	1
035	David	2
077	John	3

Column

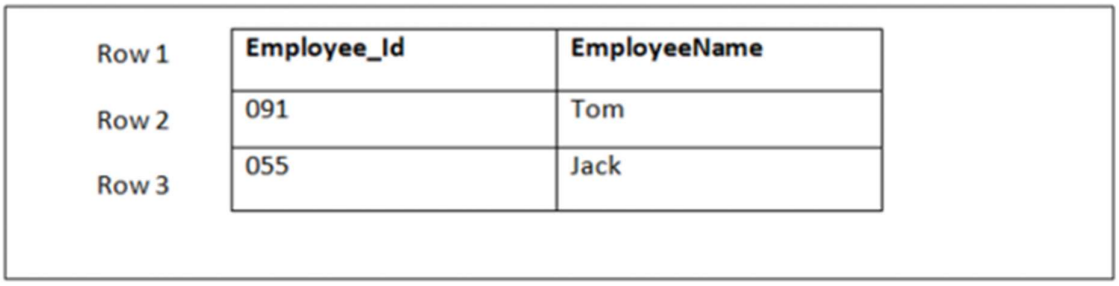
Column is in a table −



Row

Row is also called a tuple in RDBMS.

A relation in a database has rows and columns.



Primary Key

Every table has one Primary key and cannot have null values.

For example, **ProjectID** is a primary key in Project Table, since it uniquely identifies the project:

ProjectID	ProjectName
P01	Cluster Grouping System
P02	Hospital Management System

Foreign Key

Foreign Key - is a column that creates a relationship between two tables. The purpose of Foreign keys is to maintain data integrity and allow navigation between two different instances of an entity.

If we want to link two tables, use Foreign Key.

For example, Employee table has DEPT_ID that is a foreign key, which is linked to Department table.

The Department table has primary key DEPT_ID.

Super Key

Super Key is an attribute (or a set of attributes) that uniquely identify a tuple i.e. an entity in entity set. It is a superset of Candidate Key, since Candidate Keys are selected from super key.

Composite Key

A primary key having two or more attributes is called composite key. It is a combination of two or more columns.

Alternate Key - is a column or group of columns in a table that uniquely identify every row in that table.

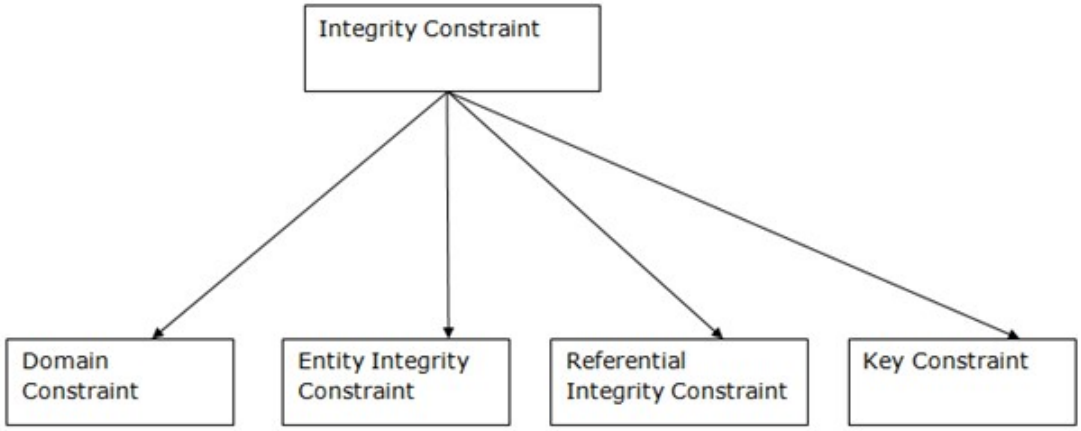
Candidate Key - is a set of attributes that uniquely identify tuples in a table. Candidate Key is a super key with no repeated attributes.

Integrity Constraints

- Integrity constraints are a set of rules. It is used to maintain the quality of information.

- Integrity constraints ensure that the data insertion, updating, and other processes have to be performed in such a way that data integrity is not affected.
- Thus, integrity constraint is used to guard against accidental damage to the database.

Types of Integrity Constraint



1. Domain constraints

- Domain constraints can be defined as the definition of a valid set of values for an attribute.
- The data type of domain includes string, character, integer, time, date, currency, etc. The value of the attribute must be available in the corresponding domain.

Example:

ID	NAME	SEMENSTER	AGE
1000	Tom	1st	17
1001	Johnson	2nd	24
1002	Leonardo	5th	21
1003	Kate	3rd	19
1004	Morgan	8th	A

Not allowed. Because AGE is an integer attribute

2. Entity integrity constraints

- The entity integrity constraint states that primary key value can't be null.
- This is because the primary key value is used to identify individual rows in relation and if the primary key has a null value, then we can't identify those rows.

- A table can contain a null value other than the primary key field.

Example:

EMPLOYEE

EMP_ID	EMP_NAME	SALARY
123	Jack	30000
142	Harry	60000
164	John	20000
	Jackson	27000

Not allowed as primary key can't contain a NULL value

3. Referential Integrity Constraints

- A referential integrity constraint is specified between two tables.
- In the Referential integrity constraints, if a foreign key in Table 1 refers to the Primary Key of Table 2, then every value of the Foreign Key in Table 1 must be null or be available in Table 2.

Example:

(Table 1)

EMP_NAME	NAME	AGE	D_No
1	Jack	20	11
2	Harry	40	24
3	John	27	18
4	Devil	38	13

D_No — Foreign key

Not allowed as D_No 18 is not defined as a Primary key of table 2 and In table 1, D_No is a foreign key defined

Relationships

(Table 2)

Primary Key — D_No

D_No	D_Location
11	Mumbai
24	Delhi
13	Noida

4. Key constraints

- Keys are the entity set that is used to identify an entity within its entity set uniquely.
- An entity set can have multiple keys, but out of which one key will be the primary key. A primary key can contain a unique and null value in the relational table.

Example:

ID	NAME	SEMENSTER	AGE
1000	Tom	1st	17
1001	Johnson	2nd	24
1002	Leonardo	5th	21
1003	Kate	3rd	19
1002	Morgan	8th	22

Not allowed. Because all row must be unique