MODULE: 5
DATABASE Assignment

1. What do you understand By Database?

- A database is an organized collection of data, so that it can be easily accessed and managed.

- The main purpose of the database is to operate a large amount of information by storing, retrieving, and managing data.
- There are many databases available like MySQL, Sybase, Oracle, MongoDB, Informix, PostgreSQL, SQL Server, etc.

2. What is Normalization?

- Normalization is the process of organizing data in a database.

- Normalization is used to minimize the redundancy from a relation or set of relations. It is also used to eliminate undesirable characteristics like Insertion, Update, and Deletion Anomalies.

- Normalization divides the larger table into smaller and links them using relationships.
- The normal form is used to reduce redundancy from the database table.

3. What is Difference between DBMS and RDBMS?

- The main difference is that RDBMS stores data in the form of tables, whereas DBMS stores data in the form of files.

- In DBMS, data is generally stored in either a hierarchical form or a navigational form. Where in in RDBMS, the tables have an identifier called primary key and the data values are stored in the form of tables.

- Normalization is not present in DBMS where Normalization is present in RDBMS.
- DBMS uses file system to store data, so there will be no relation between the tables. While in RDBMS, data values are stored in the form of tables, so a relationship between these data values will be stored in the form of a table as well.

4. What is MF Cod Rule of RDBMS Systems?

- These rules were developed by **Dr. Edgar F. Codd (E.F. Codd)** in **1985**, who has vast research knowledge on the Relational Model of database Systems.
- Every database has tables, and constraints cannot be referred to as a rational database system. And if any database has only relational data model, it cannot be a Relational Database System (RDBMS). So, some rules define a database to be the correct RDBMS.

5. What do you understand By Data Redundancy?

- Data redundancy in a Database Management System (DBMS) refers to the repetition of the same data in multiple places within a database.
- It is a concern because it can lead to inconsistencies, update anomalies, and increased storage requirements, impacting data integrity and database performance.

6. What is DDL Interpreter?

- The DDL (Data Definition Language) Instructions and stores the record in a data dictionary (in a table containing meta-data).

7. What is DML Compiler in SQL?

- DML Compiler translates DML statements in a query language within low level instructions understandable through the query evaluation engine.

8. What is SQL Key Constraints writing an Example of SQL Key Constraints.

- SQL constraints are used to specify rules for data in a table.

- Constraints are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the table. If there is any violation between the constraint and the data action, the action is aborted.

- NOT NULL - Ensures that a column cannot have a NULL value

  E.g : CREATE TABLE employee (

  emp_id INT NOT NULL,

  emp_name VARCHAR(45) NOT NULL

  );

- UNIQUE - Ensures that all values in a column are different

  E.g : CREATE TABLE employee (
  emp_id INT NOT NULL UNIQUE,
  emp_name VARCHAR(45)
  );

- PRIMARY KEY - A combination of a NOT NULL and UNIQUE. Uniquely identifies each row in a table

```
E.g : CREATE TABLE employee (
        emp_id INT PRIMARY KEY,
        emp_name VARCHAR(45)
);
```

- FOREIGN KEY - Prevents actions that would destroy links between tables

```
CREATE TABLE Orders (
    OrderID int NOT NULL PRIMARY KEY,
    OrderNumber int NOT NULL,
    PersonID int FOREIGN KEY REFERENCES Persons(PersonID)
);
```

- CHECK - Ensures that the values in a column satisfies a specific condition

```
CREATE TABLE Persons (
    ID int NOT NULL,
    LastName varchar(255) NOT NULL,
    FirstName varchar(255),
    Age int CHECK (Age>=18)
);
```

- DEFAULT - Sets a default value for a column if no value is specified

```
E.g : CREATE TABLE employee (
        emp_id INT PRIMARY KEY,
        emp_name VARCHAR(45) NOT NULL,
        salary INT DEFAULT 25000
);
```

9. What is save Point? How to create a save Point write a Query.

- A SAVEPOINT is a point in a transaction in which you can roll the transaction back to a certain point without rolling back the entire transaction.
- Save point is a command in SQL that is used with the rollback command.

```
CREATE TABLE student(ID INT, Name VARCHAR(20), Percentage
INT, Location VARCHAR(20), DateOfBirth DATE);

INSERT INTO student(ID, Name, Percentage, Location, DateOfBirth)
VALUES(1, "Manthan Koli", 79, "Delhi", "2003-08-
20"), (2, "Dev Dixit", 75, "Pune", "1999-06-
17"), (3, "Aakash Deshmukh", 87, "Mumbai", "1997-09-
12"), (4, "Aaryan Jaiswal", 90, "Chennai", "2005-10-
02"), (5, "Rahul Khanna", 92, "Ambala", "1996-03-
04"), (6, "Pankaj Deshmukh", 67, "Kanpur", "2000-02-
02"), (7, "Gaurav Kumar", 84, "Chandigarh", "1998-07-
06"), (8, "Sanket Jain", 61, "Shimla", "1990-09-
08"), (9, "Sahil Wagh", 90, "Kolkata", "1968-04-03");

START TRANSACTION;
SAVEPOINT ini;

INSERT INTO student VALUES (10, "Saurabh Singh", 54, "Kashmir",
"1989-01-06");
SAVEPOINT ins;

UPDATE student SET Name = "Mahesh Kuwar" WHERE ID =1;
SAVEPOINT upd;

DELETE FROM student WHERE ID= 6;
SAVEPOINT del;

ROLLBACK TO upd;
```

10. What is trigger and how to create a Trigger in SQL?

- A trigger is a stored procedure in a database that automatically invokes whenever a special event in the database occurs.

- For example, a trigger can be invoked when a row is inserted into a specified table or when specific table columns are updated.