Lab Assignment 31

Student Name: Chauhan Vandana Ramdayal

Student Id: AF0411629

Topic: RDBMS & MYSQL

RDBMS (Relational Database Management System)

RDBMS is a type of database management system (DBMS) that stores data in a structured format, using rows and columns, which are stored in tables. It is based on the relational model, which allows data to be related to one another, making it easier to manage and query large amounts of data. Some key features of RDBMS include:

- **Tables**: Data is organized into tables (also known as relations), where each table consists of rows (records) and columns (attributes).
- **Primary Key**: A unique identifier for each record in a table.
- **Foreign Key**: A key that links two tables together by referencing the primary key of another table.
- **Normalization**: The process of organizing data to reduce redundancy and dependency.
- **SQL (Structured Query Language)**: The standard language for managing and manipulating data in RDBMS.

Examples of popular RDBMS include:

- Oracle
- Microsoft SQL Server
- MySQL
- PostgreSQL

MySQL

MySQL is an open-source RDBMS that is widely used for web applications and databases. It is known for its speed, reliability, and ease of use. MySQL is based on the client-server architecture where the client (user) interacts with the database through the MySQL server.

Key features of MySQL:

- **Open-source**: MySQL is free to use and can be modified and distributed.
- **Cross-platform**: It works on multiple operating systems such as Windows, Linux, and macOS.
- **SQL Support**: MySQL uses SQL for querying and managing databases.
- **ACID Compliance**: MySQL supports transactions, ensuring data integrity and consistency.
- **Scalability and Performance**: MySQL can handle large databases and provides optimizations for faster performance.

Commands in MySQL:

DDL: Data Definition Language

1. Create database / table
2. alter
3. Rename
4. Drop
5. Truncate

DML: Data Manipulation Language

1. Delete
2. Update
3. Insert

DCL : Data Control Language

1. Grant
2. Revoke

TCL : Transaction Control Language

1. Commit
2. rollback
3. Savepoint

DQL : Data Query Language

1. Select

Questions:

Lab 1. Create a Database & Table Using MySQL Command-Line Client.

● Create a database with the name StudentManagementSystem.

Create a table with named Student with attributes:

● StudentID (Primary Key)

● FirstName

● LastName

● DateOfBirth

● Gender

● Email

● Phone

Code:

mysql> create database StudentManagementSystem;

mysql> use studentManagementsystem;

```
mysql> CREATE TABLE StudentManagementSystem.student (
    ->     studentid INT PRIMARY KEY,
    ->     FirstName VARCHAR(100),
    ->     LastName VARCHAR(100),
    ->     DateOfBirth DATE,
    ->     Gender VARCHAR(1),
    ->     Email VARCHAR(100),
    ->     Phone VARCHAR(100)
    -> );
```

mysql> show tables;

```
mysql> show tables;
+-----------------------------------+
| Tables_in_studentmanagementsystem |
+-----------------------------------+
| student                           |
+-----------------------------------+
```

Output:

```
mysql> desc student;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| studentid   | int          | NO   | PRI | NULL    |       |
| FirstName   | varchar(100) | YES  |     | NULL    |       |
| LastName    | varchar(100) | YES  |     | NULL    |       |
| DateOfBirth | date         | YES  |     | NULL    |       |
| Gender      | varchar(1)   | YES  |     | NULL    |       |
| Email       | varchar(100) | YES  |     | NULL    |       |
| Phone       | varchar(100) | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
```

Create a table with name Course with attributes:

● CourseID (Primary Key)

● CourseTitle

● Credits

Code:

mysql> create table StudentManagementSystem.course(CourseID int primary key,CourseTitle varchar(100),Credits varchar(100));

Output:

```
mysql> desc course;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| CourseID    | int          | NO   | PRI | NULL    |       |
| CourseTitle | varchar(100) | YES  |     | NULL    |       |
| Credits     | varchar(100) | YES  |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
```

Create a table with named Instructor with attributes:

- InstructorID (Primary Key)
- FirstName
- LastName
- Email

Code:

mysql> create table StudentManagementSystem.instructor(InstructorID int primary key,FirstName varchar(100),LastName varchar(100),Email varchar(100));

Output:

```
mysql> desc instructor;
+--------------+--------------+------+-----+---------+-------+
| Field        | Type         | Null | Key | Default | Extra |
+--------------+--------------+------+-----+---------+-------+
| InstructorID | int          | NO   | PRI | NULL    |       |
| FirstName    | varchar(100) | YES  |     | NULL    |       |
| LastName     | varchar(100) | YES  |     | NULL    |       |
| Email        | varchar(100) | YES  |     | NULL    |       |
+--------------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

Create a table with named Enrollment with attributes:

- EnrollmentID (Primary Key)
- EnrollmentDate

● StudentID(Foreign key)

● CourseID(Foreign Key)

● InstructorID(Foreign key)

Code:

```
mysql> CREATE TABLE Enrollment (
    ->     EnrollmentID INT PRIMARY KEY,
    ->     EnrollmentDate DATE,
    ->     StudentID INT,
    ->     CourseID INT,
    ->     InstructorID INT,
    ->     CONSTRAINT fk_es FOREIGN KEY (StudentID) REFERENCES student(studentid),
    ->     CONSTRAINT fk_ec FOREIGN KEY (CourseID) REFERENCES course(courseid),
    ->     CONSTRAINT fk_ei FOREIGN KEY (InstructorID) REFERENCES instructor(instructorid)
    -> );
```

Output:

```
mysql> desc Enrollment;
+----------------+------+------+-----+---------+-------+
| Field          | Type | Null | Key | Default | Extra |
+----------------+------+------+-----+---------+-------+
| EnrollmentID   | int  | NO   | PRI | NULL    |       |
| EnrollmentDate | date | YES  |     | NULL    |       |
| StudentID      | int  | YES  | MUL | NULL    |       |
| CourseID       | int  | YES  | MUL | NULL    |       |
| InstructorID   | int  | YES  | MUL | NULL    |       |
+----------------+------+------+-----+---------+-------+
```

Create a table with named Score with attributes:

● ScoreID (Primary Key)

● CourseID (Foreign key)

● StudentID (Foreign Key)

● DateOfExam

● CreditObtained

Code:

```
mysql> CREATE TABLE Score (
    ->     ScoreID INT PRIMARY KEY,
    ->     CourseID INT,
    ->     StudentID INT,
    ->     DateOfExam DATE,
    ->     CreditObtained INT,
    ->     CONSTRAINT fk_sc FOREIGN KEY (CourseID) REFERENCES course(CourseID),
    ->     CONSTRAINT fk_ss FOREIGN KEY (StudentID) REFERENCES student(studentID)
    -> );
```

Output:

```
mysql> desc score;
+----------------+------+------+-----+---------+-------+
| Field          | Type | Null | Key | Default | Extra |
+----------------+------+------+-----+---------+-------+
| ScoreID        | int  | NO   | PRI | NULL    |       |
| CourseID       | int  | YES  | MUL | NULL    |       |
| StudentID      | int  | YES  | MUL | NULL    |       |
| DateOfExam     | date | YES  |     | NULL    |       |
| CreditObtained | int  | YES  |     | NULL    |       |
+----------------+------+------+-----+---------+-------+
```

Create a table with named Feedback with attributes:

- FeedbackID (Primary Key)
- StudentID (Foreign key)
- Date
- InstructorName
- Feedback

Code:

```
mysql> CREATE TABLE Feedback (
    ->     FeedbackID INT PRIMARY KEY,
    ->     StudentID INT,
    ->     Date DATE,
    ->     InstructorName VARCHAR(100),
    ->     Feedback VARCHAR(100),
    ->     CONSTRAINT fk_feedback_student FOREIGN KEY (StudentID) REFERENCES student(StudentID)
    -> );
```

Output:

```
mysql> desc Feedback;
+----------------+--------------+------+-----+---------+-------+
| Field          | Type         | Null | Key | Default | Extra |
+----------------+--------------+------+-----+---------+-------+
| FeedbackID     | int          | NO   | PRI | NULL    |       |
| StudentID      | int          | YES  | MUL | NULL    |       |
| Date           | date         | YES  |     | NULL    |       |
| InstructorName | varchar(100) | YES  |     | NULL    |       |
| Feedback       | varchar(100) | YES  |     | NULL    |       |
+----------------+--------------+------+-----+---------+-------+
```

```
mysql> show tables;
+-----------------------------------+
| Tables_in_studentmanagementsystem |
+-----------------------------------+
| course                            |
| enrollment                        |
| feedback                          |
| instructor                        |
| score                             |
| student                           |
+-----------------------------------+
6 rows in set (0.00 sec)
```