DBMS Practical

1. Identify the case study and detailed statement of the problem and design and entity relationship (ER) Diagram. (For Example, Student Management System).

2. Create and execute DDL commands using SQL. (Create, Alter, Rename, Drop, Truncate)

3. Create and execute DML commands using SQL. (Insert, Update, Delete)

4. Execute SQL queries using Arithmetic, Comparison, logical operators.

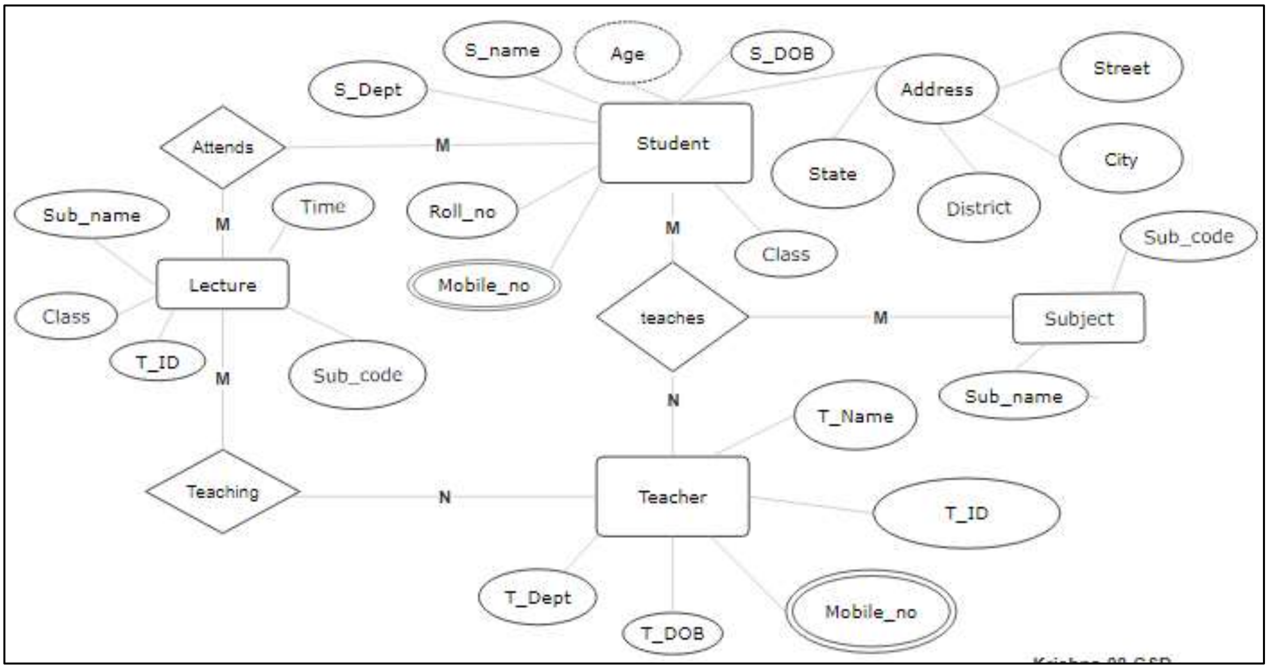
5. SQL queries using String, Arithmetic, date and time, Aggregate Functions.

6. SQL queries using the select command with group by and order by clauses.

7. Perform Nested and Complex Queries.

8. Perform DCL and TCL commands.

1) **Identify the case study and detailed statement of the problem and design and entity relationship (ER) Diagram. (For Example, Student Management System).**



2) **Create and execute DDL commands using SQL. (Create, Alter, Rename, Drop, Truncate)**

```
-- Create table
CREATE TABLE Students (
   StudentID INT AUTO_INCREMENT PRIMARY KEY,
   Name VARCHAR(50),
   GPA FLOAT(4,2),
   Age INT);

-- Alter table (add a new column)
ALTER TABLE Students
ADD COLUMN GPA DECIMAL(3,2);

-- Rename table
ALTER TABLE Students
RENAME TO Learners;

-- Drop table
DROP TABLE Learners;

-- Truncate table
TRUNCATE TABLE Students;
```

3) Create and execute DML commands using SQL. (Insert, Update, Delete)

```
-- Insert data
INSERT INTO Students (Name, Age, GPA)
VALUES ('Alice', 20, 3.5),
      ('Bob', 22, 3.2),
      ('Charlie', 21, 3.8);

-- Update data
UPDATE Students
SET GPA = 3.9
WHERE Name = 'Alice';

-- Delete data
DELETE FROM Students
WHERE Name = 'Bob';
```

4) Execute SQL queries using Arithmetic, Comparison, logical operators.

```
-- Arithmetic operators
SELECT (Age + 5) AS 'Age in 5 Years'
FROM Students;

-- Comparison operators
SELECT *
FROM Students
WHERE GPA > 3.5;

-- Logical operators
SELECT *
FROM Students
WHERE Age > 20 AND GPA > 3.5;
```

5) SQL queries using String, Arithmetic, date and time, Aggregate Functions.

```
-- String functions
SELECT UPPER(Name) AS 'Name'
FROM Students;

-- Arithmetic functions
SELECT AVG(Age) AS 'Average Age'
FROM Students;

-- Date and time functions
SELECT NOW() AS 'Current Time';
```

6) **SQL queries using the select command with group by and order by clauses.**

```
-- Group by
SELECT Age, COUNT(*)
FROM Students
GROUP BY Age;

-- Order by
SELECT *
FROM Students
ORDER BY GPA DESC;
```

7) **Perform Nested and Complex Queries.**

```
-- Nested query
SELECT *
FROM Students
WHERE Age IN (SELECT MAX(Age) FROM Students);

-- Complex query
SELECT s.Name, a.Title
FROM Students s
JOIN Books b ON s.StudentID = b.StudentID
JOIN Authors a ON b.AuthorID = a.AuthorID;
```

8) **Perform DCL and TCL commands.**

```
-- DCL command (grant/revoke)
GRANT SELECT ON Students TO Bob;

-- TCL command (commit/rollback)
COMMIT;
ROLLBACK;
```