MIT World Peace University

Database Management Systems
Second Year B. Tech, Semester 4

Learning SQL DML Commands
Data Manipulation Language

Assignment No. 3

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1 Aim

Write suitable DML and select command to manipulate and retrieve requested data from tables.

2 Objectives

1. DML (Insert, Update, Delete) commands,
2. SQL Select- Logical, IN, Negation, NULL, Comparison Operators.
3. Where Clause, Between AND, Exists, ALL, LIKE

3 Problem Statement

4 Theory

4.1 SQL Data Manipulation Language (DML)

4.1.1 What is Data Manipulation Language?

Data Manipulation Language (DML) is a computer language used to access and manipulate data stored in a database. It is used to retrieve, insert, update, and delete data in a database.

4.1.2 DML Commands

The following are the Commands that are used in DML:

1. SELECT - Retrieves data from a database.
2. INSERT - Inserts data into a table.
3. UPDATE - Updates existing data within a table.
4. DELETE - Deletes existing data within a table.

4.2 DML Command Syntax and Examples

1. SELECT - Retrieves data from a database.

```
SELECT column1, column2, ...
FROM table_name;
```

2. INSERT - Inserts data into a table.

```
INSERT INTO table_name (column1, column2, column3, ...)
VALUES (value1, value2, value3, ...);
```

3. UPDATE - Updates existing data within a table.

```
UPDATE table_name
SET column1 = value1, column2 = value2, ...
WHERE condition;
```

4. DELETE - Deletes existing data within a table.

   ```
   DELETE FROM table_name WHERE condition;
   ```

4.3 SELECT query

4.3.1 What is SELECT query?

The SELECT statement is used to select data from a database. The data returned is stored in a result table, called the result-set.

4.3.2 SELECT Syntax

```
SELECT column_name(s)
FROM table_name
WHERE column_name operator value;
```

4.3.3 SELECT Operators

The following are the Operators that are used in SELECT:

1. **AND** - Returns rows where both conditions are true.
2. **OR** - Returns rows where either condition is true.
3. **NOT** - Returns rows where the condition(s) is not true.
4. **BETWEEN** - Returns rows where the value is within a range of two values.
5. **LIKE** - Returns rows where the value matches a pattern.
6. **IN** - Returns rows where the value matches any value in a list.

4.3.4 Examples of the SELECT Query

1. `SELECT * FROM CUSTOMERS;`
2. `SELECT * FROM CUSTOMERS WHERE CUST_ID = 1;`
3. `SELECT * FROM CUSTOMERS WHERE CUST_ID = 1 AND CUST_NAME = 'Krishnaraj';`
4. `SELECT * FROM CUSTOMERS WHERE CUST_ID = 1 OR CUST_NAME = 'Krishnaraj';`
5. `SELECT * FROM CUSTOMERS WHERE NOT CUST_ID = 1;`
6. `SELECT * FROM CUSTOMERS WHERE CUST_ID BETWEEN 1 AND 5;`
7. `SELECT * FROM CUSTOMERS WHERE CUST_NAME LIKE 'Krish%';`
8. `SELECT * FROM CUSTOMERS WHERE CUST_ID IN (1, 2, 3);`

4.4 SQL Operators

4.4.1 What are SQL Operators?

Operators are special symbols in SQL that allow you to perform specific operations on data.

4.4.2 SQL Operators

The following are the Operators that are used in SQL:

1. **Arithmetic Operators** - Used to perform mathematical operations on numbers.
2. **Comparison Operators** - Used to compare values.
3. **Logical Operators** - Used to combine two or more conditions.
4. **Misc Operators** - Used to perform other operations.

4.4.3 Arithmetic Operators

The following are the Arithmetic Operators that are used in SQL:

1. **+** - Addition
2. **-** - Subtraction
3. * - Multiplication
4. / - Division
5. **MOD** - Modulus

4.4.4 Comparison Operators

The following are the Comparison Operators that are used in SQL:

1. **=** - Equal
2. **<>** - Not equal. Note: In some versions of SQL this operator may be written as !=
3. **>** - Greater than
4. **<** - Less than
5. **>=** - Greater than or equal
6. **<=** - Less than or equal
7. **BETWEEN** - Between an inclusive range
8. **LIKE** - Search for a pattern
9. **IN** - To specify multiple possible values for a column

4.4.5 Logical Operators

The following are the Logical Operators that are used in SQL:

1. **AND** - Logical AND
2. **OR** - Logical OR
3. **NOT** - Logical NOT

5 Platform

Operating System: Arch Linux x86-64
IDEs or Text Editors Used: Draw.io for Drawing the ER diagram.

6 Input

Given Database from the Problem Statement for the Assignment for our batch. (A1 PA 20)

7 Output

```
MariaDB [dbms_lab]> create database Company;
Query OK, 1 row affected (0.001 sec)

MariaDB [dbms_lab]> show databases;
+--------------------+
| Database           |
+--------------------+
| Company            |
| class              |
| class_stuff        |
| dbms_lab           |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
| test               |
| test_libreoffice   |
+--------------------+
10 rows in set (0.001 sec)

MariaDB [dbms_lab]> use Company;
Database changed
MariaDB [Company]> create table emp(empno int primary key, empname varchar(50) not
    null, job varchar(10), mgr int not null, hiredate date, sal int not null, comm
    int, deptno int not null);
Query OK, 0 rows affected (0.008 sec)

MariaDB [Company]> describe emp;
+----------+-------------+------+-----+---------+-------+
| Field    | Type        | Null | Key | Default | Extra |
+----------+-------------+------+-----+---------+-------+
| empno    | int(11)     | NO   | PRI | NULL    |       |
| empname  | varchar(50) | NO   |     | NULL    |       |
```

```
| job      | varchar(10) | YES  |     | NULL    |       |
| mgr      | int(11)     | NO   |     | NULL    |       |
| hiredate | date        | YES  |     | NULL    |       |
| sal      | int(11)     | NO   |     | NULL    |       |
| comm     | int(11)     | YES  |     | NULL    |       |
| deptno   | int(11)     | NO   |     | NULL    |       |
+----------+-------------+------+-----+---------+-------+
8 rows in set (0.002 sec)

MariaDB [Company]> create table dept(deptno int primary key, dname varchar(50),
    loc varchar(50) not null);
Query OK, 0 rows affected (0.008 sec)

MariaDB [Company]> describe dept;
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| deptno | int(11)     | NO   | PRI | NULL    |       |
| dname  | varchar(50) | YES  |     | NULL    |       |
| loc    | varchar(50) | NO   |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
3 rows in set (0.002 sec)

MariaDB [Company]> insert into emp values (7369,  "Smith",  "Clerk",  7902,  "
    1980-12-17",  800,  300,  20);
Query OK, 1 row affected (0.001 sec)

MariaDB [Company]> select * from emp;
+-------+---------+-------+------+------------+-----+------+--------+
| empno | empname | job   | mgr  | hiredate   | sal | comm | deptno |
+-------+---------+-------+------+------------+-----+------+--------+
|  7369 | Smith   | Clerk | 7902 | 1980-12-17 | 800 |  300 |     20 |
+-------+---------+-------+------+------------+-----+------+--------+
1 row in set (0.001 sec)

MariaDB [Company]> insert into emp values (7499, "Allen", "Salesman", 7698, "
    1981-02-20", 1600, 300, 30);
Query OK, 1 row affected (0.001 sec)

MariaDB [Company]> select * from emp;
+-------+---------+----------+------+------------+------+------+--------+
| empno | empname | job      | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+----------+------+------------+------+------+--------+
|  7369 | Smith   | Clerk    | 7902 | 1980-12-17 |  800 |  300 |     20 |
|  7499 | Allen   | Salesman | 7698 | 1981-02-20 | 1600 |  300 |     30 |
+-------+---------+----------+------+------------+------+------+--------+
2 rows in set (0.000 sec)

MariaDB [Company]> insert into dept values(10, "Accounting", "New York");
Query OK, 1 row affected (0.001 sec)

MariaDB [Company]> insert into dept values(20, "Research", "Dallas");
Query OK, 1 row affected (0.001 sec)

MariaDB [Company]> insert into dept values
    -> (30, "Sales", "Chicago");
Query OK, 1 row affected (0.001 sec)

MariaDB [Company]> insert into dept values(40, "Operations", "Boston");
```

```
Query OK, 1 row affected (0.001 sec)

MariaDB [Company]> select * from dept;
+--------+------------+----------+
| deptno | dname      | loc      |
+--------+------------+----------+
|     10 | Accounting | New York |
|     20 | Research   | Dallas   |
|     30 | Sales      | Chicago  |
|     40 | Operations | Boston   |
+--------+------------+----------+
4 rows in set (0.001 sec)

MariaDB [Company]> select * from emp;
+-------+---------+----------+------+------------+------+------+--------+
| empno | empname | job      | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+----------+------+------------+------+------+--------+
|  7369 | Smith   | Clerk    | 7902 | 1980-12-17 |  800 |  300 |     20 |
|  7499 | Allen   | Salesman | 7698 | 1981-02-20 | 1600 |  300 |     30 |
+-------+---------+----------+------+------------+------+------+--------+
2 rows in set (0.001 sec)

MariaDB [Company]> insert into emp values(9360, "Isaiah", "Accounting", 7940, "
    2101-9-3", 4000, 1390, 10);
Query OK, 1 row affected

MariaDB [Company]> insert into emp values(9085, "Katie", "Research", 5919, "
    1997-1-26", 8241, 1166, 20);
Query OK, 1 row affected

MariaDB [Company]> insert into emp values(5883, "Jeffery", "Research", 5817, "
    2057-8-3", 2033, 549, 20);
Query OK, 1 row affected

MariaDB [Company]> insert into emp values(5595, "Isabella", "Sales", 8245, "
    2075-9-10", 2534, 1545, 30);
Query OK, 1 row affected

MariaDB [Company]> insert into emp values(9180, "Jesse", "Accounting", 2678, "
    2101-8-22", 3238, 1796, 10);
Query OK, 1 row affected

MariaDB [Company]> insert into emp values(9487, "Amelia", "Research",7940 , "
    2123-1-17", 5368, 1998, 20);
Query OK, 1 row affected

MariaDB [Company]> insert into emp values(8467, "Mollie", "Accounting", 5919, "
    2015-2-9", 3999, 526, 10);
Query OK, 1 row affected

MariaDB [Company]> insert into emp values(9384, "Matilda", "Operations", 5817, "
    2025-5-23", 2494, 1170, 50);
Query OK, 1 row affected

MariaDB [Company]> insert into emp values(6880, "Cameron", "Sales", 8245, "
    2059-5-9", 6311, 1406, 30);
Query OK, 1 row affected

```

```
MariaDB [Company]> insert into emp values(7235, "Stephen", "Operations", 2678, "2083-0-31", 6556, 1698, 50);
Query OK, 1 row affected

MariaDB [Company]> insert into emp values(7553, "Angel", "Sales", 2678, "2099-6-3", 9352, 983, 30);
Query OK, 1 row affected
```

8 Executed Queries

8.1 Set 1

```

## Queries Set 1

1. List the number of employees and average salary for employees in department 20.

MariaDB [Company]> select avg(sal),count(*) from emp where deptno=20;
+-----------+----------+
| avg(sal)  | count(*) |
+-----------+----------+
| 5214.0000 |        3 |
+-----------+----------+
1 row in set (0.007 sec)

2. List name, salary and PF amount of all employees. (PF is calculated as 10% of basic salary)

MariaDB [Company]> select empname, sal, sal * 0.10 as PF from emp;
+----------+------+--------+
| empname  | sal  | PF     |
+----------+------+--------+
| Isabella | 2534 | 253.40 |
| Jeffery  | 2033 | 203.30 |
| Cameron  | 6311 | 631.10 |
| Stephen  | 6556 | 655.60 |
| Angel    | 9352 | 935.20 |
| Ramesh   |  500 |  50.00 |
| Krish    | 2000 | 200.00 |
| Mollie   | 3999 | 399.90 |
| Katie    | 8241 | 824.10 |
| Jesse    | 3562 | 356.20 |
| Isaiah   | 4000 | 400.00 |
| Matilda  | 2494 | 249.40 |
| Amelia   | 5368 | 536.80 |
+----------+------+--------+
13 rows in set (0.001 sec)

3. List the employee details in the ascending order of their basic salary.

MariaDB [Company]> select * from emp order by sal;
+-------+----------+------------+------+------------+------+------+--------+
| empno | empname  | job        | mgr  | hiredate   | sal  | comm | deptno |
+-------+----------+------------+------+------------+------+------+--------+
|  8343 | Ramesh   | PT         | 7698 | 2023-12-12 |  500 |  300 |     60 |
|  8344 | Krish    | PT         | 7698 | 2023-12-12 | 2000 |  300 |     60 |
|  5883 | Jeffery  | Research   | 5817 | 2057-08-03 | 2033 |  549 |     20 |
|  9384 | Matilda  | Operations | 5817 | 2025-05-23 | 2494 | 1170 |     40 |
```

```
|  5595 | Isabella | Sales      | 8245 | 2075-09-10 | 2534 | 1545 |     30 |
|  9180 | Jesse    | Accounting | 2678 | 2101-08-22 | 3562 | 1796 |     10 |
|  8467 | Mollie   | Accounting | 5919 | 2015-02-09 | 3999 |  526 |     10 |
|  9360 | Isaiah   | Accounting | 7940 | 2101-09-03 | 4000 | 1390 |     10 |
|  9487 | Amelia   | Research   | 7940 | 2123-01-17 | 5368 | 1998 |     20 |
|  6880 | Cameron  | Sales      | 8245 | 2059-05-09 | 6311 | 1406 |     30 |
|  7235 | Stephen  | Operations | 2678 | 2083-00-31 | 6556 | 1698 |     40 |
|  9085 | Katie    | Research   | 5919 | 1997-01-26 | 8241 | 1166 |     20 |
|  7553 | Angel    | Sales      | 2678 | 2099-06-03 | 9352 |  983 |     30 |
+-------+----------+------------+------+------------+------+------+--------+
13 rows in set (0.001 sec)


4. List the employee name and hire date in the descending order of the hire date.

MariaDB [Company]> select empname, hiredate from emp order by hiredate desc;
+----------+------------+
| empname  | hiredate   |
+----------+------------+
| Amelia   | 2123-01-17 |
| Isaiah   | 2101-09-03 |
| Jesse    | 2101-08-22 |
| Angel    | 2099-06-03 |
| Stephen  | 2083-00-31 |
| Isabella | 2075-09-10 |
| Cameron  | 2059-05-09 |
| Jeffery  | 2057-08-03 |
| Matilda  | 2025-05-23 |
| Ramesh   | 2023-12-12 |
| Krish    | 2023-12-12 |
| Mollie   | 2015-02-09 |
| Katie    | 1997-01-26 |
+----------+------------+
13 rows in set (0.002 sec)

5. List employee name, salary, PF, HRA, DA and gross; order the results in the
    ascending order of
gross. HRA is 50% of the salary and DA is 30% of the salary.

MariaDB [Company]> select empname, sal, sal*.10 as PF, sal*.50 as HRA, sal*.30 as
    DA, sal + sal*.90 as Gross from emp order by Gross;
+----------+------+--------+---------+---------+----------+
| empname  | sal  | PF     | HRA     | DA      | Gross    |
+----------+------+--------+---------+---------+----------+
| Ramesh   |  500 |  50.00 |  250.00 |  150.00 |   950.00 |
| Krish    | 2000 | 200.00 | 1000.00 |  600.00 |  3800.00 |
| Jeffery  | 2033 | 203.30 | 1016.50 |  609.90 |  3862.70 |
| Matilda  | 2494 | 249.40 | 1247.00 |  748.20 |  4738.60 |
| Isabella | 2534 | 253.40 | 1267.00 |  760.20 |  4814.60 |
| Jesse    | 3562 | 356.20 | 1781.00 | 1068.60 |  6767.80 |
| Mollie   | 3999 | 399.90 | 1999.50 | 1199.70 |  7598.10 |
| Isaiah   | 4000 | 400.00 | 2000.00 | 1200.00 |  7600.00 |
| Amelia   | 5368 | 536.80 | 2684.00 | 1610.40 | 10199.20 |
| Cameron  | 6311 | 631.10 | 3155.50 | 1893.30 | 11990.90 |
| Stephen  | 6556 | 655.60 | 3278.00 | 1966.80 | 12456.40 |
| Katie    | 8241 | 824.10 | 4120.50 | 2472.30 | 15657.90 |
| Angel    | 9352 | 935.20 | 4676.00 | 2805.60 | 17768.80 |
+----------+------+--------+---------+---------+----------+
13 rows in set (0.001 sec)
```

```
6. List the department numbers and number of employees in each department.

MariaDB [Company]> select deptno,count(*) from emp group by deptno;
+--------+----------+
| deptno | count(*) |
+--------+----------+
|     10 |        3 |
|     20 |        3 |
|     30 |        3 |
|     40 |        2 |
|     60 |        2 |
+--------+----------+
5 rows in set (0.002 sec)

7. Increment the Salary of salesman by 10% of basic salary.

MariaDB [Company]> update emp set sal=sal+(sal*.10) where job='sales';
Query OK, 3 rows affected (0.006 sec)
Rows matched: 3  Changed: 3  Warnings: 0

8. List the total salary, maximum and minimum salary and average salary of the
    employees, for
department 20.

select sum(sal),max(sal),min(sal),avg(sal) from emp where deptno=20;
+----------+----------+----------+-----------+
| sum(sal) | max(sal) | min(sal) | avg(sal)  |
+----------+----------+----------+-----------+
|    15642 |     8241 |     2033 | 5214.0000 |
+----------+----------+----------+-----------+
1 row in set (0.001 sec)

9. List the employees whose names contains 3 rd letter as 'I'.

MariaDB [Company]> select empname from emp where empname like '__i%';
+---------+
| empname |
+---------+
| Krish   |
+---------+
1 row in set (0.001 sec)

10. List the maximum salary paid to a salesman.

MariaDB [Company]> select *, max(sal) from emp where job='sales';
+-------+----------+-------+------+------------+------+------+--------+----------+
| empno | empname  | job   | mgr  | hiredate   | sal  | comm | deptno | max(sal) |
+-------+----------+-------+------+------------+------+------+--------+----------+
|  5595 | Isabella | Sales | 8245 | 2075-09-10 | 2787 | 1545 |     30 |    10287 |
+-------+----------+-------+------+------------+------+------+--------+----------+
1 row in set (0.001 sec)


11. Increase the salary of salesman by 10% of their current salary.

MariaDB [Company]> update emp set sal=sal+(sal*.10) where job='sales';
Query OK, 3 rows affected (0.001 sec)
Rows matched: 3  Changed: 3  Warnings: 0
```

8.2 Set 2

```
1. List the employee names and his annual salary dept wise.

MariaDB [Company]> select deptno, empname, sal*12 as Annual_Sal from emp order by
    deptno;
+--------+----------+------------+
| deptno | empname  | Annual_Sal |
+--------+----------+------------+
|     10 | Mollie   |      47988 |
|     10 | Isaiah   |      48000 |
|     10 | Jesse    |      38856 |
|     20 | Katie    |      98892 |
|     20 | Amelia   |      64416 |
|     20 | Jeffery  |      24396 |
|     30 | Angel    |     112224 |
|     30 | Cameron  |      75732 |
|     30 | Isabella |      30408 |
|     50 | Stephen  |      78672 |
|     50 | Matilda  |      29928 |
+--------+----------+------------+
11 rows in set (0.000 sec)

2. Find out least 5 earners of the company.

MariaDB [Company]> select empname from emp order by sal asc limit 5;
+----------+
| empname  |
+----------+
| Jeffery  |
| Matilda  |
| Isabella |
| Jesse    |
| Mollie   |
+----------+
5 rows in set (0.001 sec)
3. List the records from emp whose deptno is not in dept

MariaDB [Company]> select * from emp where deptno not in (select deptno from dept)
    ;
+-------+---------+------+------+------------+------+------+--------+
| empno | empname | job  | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+------+------+------------+------+------+--------+
|  8344 | Krish   | PT   | 7698 | 2023-12-12 | 2000 |  300 |     60 |
+-------+---------+------+------+------------+------+------+--------+
1 row in set (0.002 sec)

4. List those employees whose sal is odd value.

MariaDB [Company]> select * from emp where sal % 2 != 0;
+-------+---------+------------+------+------------+------+------+--------+
| empno | empname | job        | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+------------+------+------------+------+------+--------+
|  5883 | Jeffery | Research   | 5817 | 2057-08-03 | 2033 |  549 |     20 |
|  6880 | Cameron | Sales      | 8245 | 2059-05-09 | 6311 | 1406 |     30 |
```

```
|  8467 | Mollie  | Accounting | 5919 | 2015-02-09 | 3999 |  526 |     10 |
|  9085 | Katie   | Research   | 5919 | 1997-01-26 | 8241 | 1166 |     20 |
+-------+---------+------------+------+------------+------+------+--------+
4 rows in set (0.001 sec)

5. List the employees whose sal contain 3 digits.

MariaDB [Company]> select * from emp where sal/1000 < 1;
+-------+---------+------+------+------------+-----+------+--------+
| empno | empname | job  | mgr  | hiredate   | sal | comm | deptno |
+-------+---------+------+------+------------+-----+------+--------+
|  8343 | Ramesh  | PT   | 7698 | 2023-12-12 | 500 |  300 |     60 |
+-------+---------+------+------+------------+-----+------+--------+
1 row in set (0.001 sec)

6. List the employees who joined in the month of 'DEC'

MariaDB [Company]> select * from emp where hiredate like "%%%%-12-%%";
+-------+---------+------+------+------------+------+------+--------+
| empno | empname | job  | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+------+------+------------+------+------+--------+
|  8343 | Ramesh  | PT   | 7698 | 2023-12-12 |  500 |  300 |     60 |
|  8344 | Krish   | PT   | 7698 | 2023-12-12 | 2000 |  300 |     60 |
+-------+---------+------+------+------------+------+------+--------+
2 rows in set (0.001 sec)

7. List the employees whose names contains 'A'

MariaDB [Company]> select * from emp where empname like "A%";
+-------+---------+----------+------+------------+------+------+--------+
| empno | empname | job      | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+----------+------+------------+------+------+--------+
|  7553 | Angel   | Sales    | 2678 | 2099-06-03 | 9352 |  983 |     30 |
|  9487 | Amelia  | Research | 7940 | 2123-01-17 | 5368 | 1998 |     20 |
+-------+---------+----------+------+------------+------+------+--------+
2 rows in set (0.001 sec)

8. List the maximum, minimum and average salary in the company.

MariaDB [Company]> select max(sal), min(sal), avg(sal) from emp;
+----------+----------+-----------+
| max(sal) | min(sal) | avg(sal)  |
+----------+----------+-----------+
|     9352 |      500 | 4355.8462 |
+----------+----------+-----------+
1 row in set (0.001 sec)

9. Write a query to return the day of the week for any date(or HIRE_DATE) entered
   in format
'DD-MM-YY'


MariaDB [Company]> select dayname(hiredate) from emp;
+-------------------+
| dayname(hiredate) |
+-------------------+
| Tuesday           |
| Friday            |
| Friday            |
```

```
| NULL               |
| Wednesday          |
| Tuesday            |
| Tuesday            |
| Monday             |
| Sunday             |
| Monday             |
| Saturday           |
| Friday             |
| Sunday             |
+--------------------+
13 rows in set (0.002 sec)

10. Count the no of characters in employee name without considering spaces for
    each name.

MariaDB [Company]> select empname, length(replace(empname, ' ', '')) + 1 as length
    from emp;
+----------+--------+
| empname  | length |
+----------+--------+
| Isabella |      9 |
| Jeffery  |      8 |
| Cameron  |      8 |
| Stephen  |      8 |
| Angel    |      6 |
| Ramesh   |      7 |
| Krish    |      6 |
| Mollie   |      7 |
| Katie    |      6 |
| Jesse    |      6 |
| Isaiah   |      7 |
| Matilda  |      8 |
| Amelia   |      7 |
+----------+--------+
13 rows in set (0.001 sec)

11. List the employees who are drawing less than 1000. sort the output by salary.

MariaDB [Company]> select * from emp where sal < 1000 order by sal;
+-------+---------+------+------+------------+-----+------+--------+
| empno | empname | job  | mgr  | hiredate   | sal | comm | deptno |
+-------+---------+------+------+------------+-----+------+--------+
|  8343 | Ramesh  | PT   | 7698 | 2023-12-12 | 500 |  300 |     60 |
+-------+---------+------+------+------------+-----+------+--------+
1 row in set (0.002 sec)

```

8.3 Set 3

```

1. Write a query in SQL to display the unique designations for the employees.

MariaDB [Company]> select distinct job from emp;
+------------+
| job        |
+------------+
| Sales      |
```

```
| Research   |
| Operations |
| PT         |
| Accounting |
+------------+
5 rows in set (0.001 sec)

2. Delete Employees who joined in Year 1980.

MariaDB [Company]> delete from emp where year(hiredate) = 1980;
Query OK, 0 rows affected (0.001 sec)

3. Increase the salary of Managers by 20% of their current salary.

MariaDB [Company]> update emp set sal = sal + sal*0.2 where job = 'Manager';
Query OK, 0 rows affected (0.001 sec)
Rows matched: 0  Changed: 0  Warnings: 0

4. List employees not belonging to department 30, 40, or 10.

MariaDB [Company]> select * from emp where deptno not in (30, 40, 10);
+-------+---------+----------+------+------------+------+------+--------+
| empno | empname | job      | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+----------+------+------------+------+------+--------+
|  5883 | Jeffery | Research | 5817 | 2057-08-03 | 2236 |  549 |     20 |
|  8343 | Ramesh  | PT       | 7698 | 2023-12-12 |  500 |    0 |     60 |
|  8344 | Krish   | PT       | 7698 | 2023-12-12 | 2000 |  300 |     60 |
|  9085 | Katie   | Research | 5919 | 1997-01-26 | 9065 | 1166 |     20 |
|  9487 | Amelia  | Research | 7940 | 2123-01-17 | 5905 | 1998 |     20 |
+-------+---------+----------+------+------------+------+------+--------+
5 rows in set (0.001 sec)

5. List the different designations in the company.

MariaDB [Company]> select distinct job from emp;
+------------+
| job        |
+------------+
| Sales      |
| Research   |
| Operations |
| PT         |
| Accounting |
+------------+
5 rows in set (0.001 sec)

6. List the names of employees who are not eligible for commission.

MariaDB [Company]> select * from emp where sal < 1000;
+-------+---------+------+------+------------+-----+------+--------+
| empno | empname | job  | mgr  | hiredate   | sal | comm | deptno |
+-------+---------+------+------+------------+-----+------+--------+
|  8343 | Ramesh  | PT   | 7698 | 2023-12-12 | 500 |    0 |     60 |
+-------+---------+------+------+------------+-----+------+--------+
1 row in set (0.001 sec)

7. List employees whose names either start or end with "S".

MariaDB [Company]>  select * from emp where empname like 'S%' or empname like '%S'
```

```
    ;
+-------+---------+------------+------+------------+------+------+--------+
| empno | empname | job        | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+------------+------+------------+------+------+--------+
|  7235 | Stephen | Operations | 2678 | 2083-00-31 | 6556 | 1698 |     40 |
+-------+---------+------------+------+------------+------+------+--------+
1 row in set (0.001 sec)

8. List employees whose names have letter "A" as second letter in their names.

MariaDB [Company]> select * from emp where empname like '_A%';
+-------+---------+------------+------+------------+------+------+--------+
| empno | empname | job        | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+------------+------+------------+------+------+--------+
|  6880 | Cameron | Sales      | 8245 | 2059-05-09 | 7636 | 1406 |     30 |
|  8343 | Ramesh  | PT         | 7698 | 2023-12-12 |  500 |    0 |     60 |
|  9085 | Katie   | Research   | 5919 | 1997-01-26 | 9065 | 1166 |     20 |
|  9384 | Matilda | Operations | 5817 | 2025-05-23 | 2494 | 1170 |     40 |
+-------+---------+------------+------+------------+------+------+--------+
4 rows in set (0.001 sec)

9. List the number of employees working with the company.

MariaDB [Company]> select count(*) from emp;
+----------+
| count(*) |
+----------+
|       13 |
+----------+
1 row in set (0.001 sec)

10. List the emps with hiredate in format June 4,1988.

MariaDB [Company]> select * from emp where hiredate = '1988-06-04';
Empty set (0.001 sec)

11. List the salesmen who get the commission within a range of 200 and 5000.

MariaDB [Company]> select * from emp where job = 'Sales' and comm between 200 and
    5000;
+-------+----------+-------+------+------------+-------+------+--------+
| empno | empname  | job   | mgr  | hiredate   | sal   | comm | deptno |
+-------+----------+-------+------+------------+-------+------+--------+
|  5595 | Isabella | Sales | 8245 | 2075-09-10 |  3066 | 1545 |     30 |
|  6880 | Cameron  | Sales | 8245 | 2059-05-09 |  7636 | 1406 |     30 |
|  7553 | Angel    | Sales | 2678 | 2099-06-03 | 11316 |  983 |     30 |
+-------+----------+-------+------+------------+-------+------+--------+
3 rows in set (0.001 sec)

```

8.4 Set 4

```

1. List names of employees who are more than 2 years old in the company.

MariaDB [Company]> select empname from emp where datediff(curdate(), hiredate)/365
    > 2;
+---------+
```

```
| empname |
+---------+
| Mollie  |
| Katie   |
+---------+
2 rows in set (0.001 sec)

2. List the employee details in the ascending order of their basic salary.

MariaDB [Company]> select * from emp order by sal;
+-------+----------+------------+------+------------+------+------+--------+
| empno | empname  | job        | mgr  | hiredate   | sal  | comm | deptno |
+-------+----------+------------+------+------------+------+------+--------+
|  8343 | Ramesh   | PT         | 7698 | 2023-12-12 |  500 |  300 |     60 |
|  8344 | Krish    | PT         | 7698 | 2023-12-12 | 2000 |  300 |     60 |
|  5883 | Jeffery  | Research   | 5817 | 2057-08-03 | 2033 |  549 |     20 |
|  9384 | Matilda  | Operations | 5817 | 2025-05-23 | 2494 | 1170 |     40 |
|  5595 | Isabella | Sales      | 8245 | 2075-09-10 | 2534 | 1545 |     30 |
|  9180 | Jesse    | Accounting | 2678 | 2101-08-22 | 3238 | 1796 |     10 |
|  8467 | Mollie   | Accounting | 5919 | 2015-02-09 | 3999 |  526 |     10 |
|  9360 | Isaiah   | Accounting | 7940 | 2101-09-03 | 4000 | 1390 |     10 |
|  9487 | Amelia   | Research   | 7940 | 2123-01-17 | 5368 | 1998 |     20 |
|  6880 | Cameron  | Sales      | 8245 | 2059-05-09 | 6311 | 1406 |     30 |
|  7235 | Stephen  | Operations | 2678 | 2083-00-31 | 6556 | 1698 |     40 |
|  9085 | Katie    | Research   | 5919 | 1997-01-26 | 8241 | 1166 |     20 |
|  7553 | Angel    | Sales      | 2678 | 2099-06-03 | 9352 |  983 |     30 |
+-------+----------+------------+------+------------+------+------+--------+
13 rows in set (0.002 sec)

3. Display the employees who have more salary as that of Smith

MariaDB [Company]> select * from emp where sal > (select sal from emp where
    empname = 'Mollie');
+-------+---------+------------+------+------------+------+------+--------+
| empno | empname | job        | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+------------+------+------------+------+------+--------+
|  6880 | Cameron | Sales      | 8245 | 2059-05-09 | 6311 | 1406 |     30 |
|  7235 | Stephen | Operations | 2678 | 2083-00-31 | 6556 | 1698 |     40 |
|  7553 | Angel   | Sales      | 2678 | 2099-06-03 | 9352 |  983 |     30 |
|  9085 | Katie   | Research   | 5919 | 1997-01-26 | 8241 | 1166 |     20 |
|  9360 | Isaiah  | Accounting | 7940 | 2101-09-03 | 4000 | 1390 |     10 |
|  9487 | Amelia  | Research   | 7940 | 2123-01-17 | 5368 | 1998 |     20 |
+-------+---------+------------+------+------------+------+------+--------+
6 rows in set (0.001 sec)

4. Increment the salary of Emp no. 9180 by 10% of his current salary.

MariaDB [Company]> select * from emp where empno = 9180;
+-------+---------+------------+------+------------+------+------+--------+
| empno | empname | job        | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+------------+------+------------+------+------+--------+
|  9180 | Jesse   | Accounting | 2678 | 2101-08-22 | 3562 | 1796 |     10 |
+-------+---------+------------+------+------------+------+------+--------+
1 row in set (0.001 sec)

5. List the employees whose salary is between 10000 and 25000.

MariaDB [Company]> select * from emp where sal between 10000 and 25000;
+-------+---------+-------+------+------------+-------+------+--------+
```

```
| empno | empname | job    | mgr  | hiredate   | sal   | comm | deptno |
+-------+---------+--------+------+------------+-------+------+--------+
|  7553 | Angel   | Sales  | 2678 | 2099-06-03 | 11316 |  983 |     30 |
+-------+---------+--------+------+------------+-------+------+--------+
1 row in set (0.000 sec)

6. List the names of employees who are not eligible for commission.

MariaDB [Company]> select * from emp where sal < 1000;
+-------+---------+------+------+------------+-----+------+--------+
| empno | empname | job  | mgr  | hiredate   | sal | comm | deptno |
+-------+---------+------+------+------------+-----+------+--------+
|  8343 | Ramesh  | PT   | 7698 | 2023-12-12 | 500 |    0 |     60 |
+-------+---------+------+------+------------+-----+------+--------+
1 row in set (0.001 sec)

7. Increment the Salary of Research by 10% of basic salary.

MariaDB [Company]> update emp set sal = sal + sal*0.1 where job = "Research";
Query OK, 3 rows affected (0.001 sec)
Rows matched: 3  Changed: 3  Warnings: 0

8. List the total salary, maximum and minimum salary and average salary of the
    employees
jobwise.

MariaDB [Company]> select job, sum(sal) as total, max(sal) as max, min(sal) as min
    , avg(sal) as avg from emp group by job;
+------------+-------+-------+------+-----------+
| job        | total | max   | min  | avg       |
+------------+-------+-------+------+-----------+
| Accounting | 11561 |  4000 | 3562 | 3853.6667 |
| Operations |  9050 |  6556 | 2494 | 4525.0000 |
| PT         |  2500 |  2000 |  500 | 1250.0000 |
| Research   | 17206 |  9065 | 2236 | 5735.3333 |
| Sales      | 22018 | 11316 | 3066 | 7339.3333 |
+------------+-------+-------+------+-----------+
5 rows in set (0.002 sec)

9. Delete the Employee whose name starts with P.

MariaDB [Company]> delete from emp where empname like 'P%';
Query OK, 0 rows affected (0.001 sec)

10. List the employees whose designation is "Research" and commission is > 500.

MariaDB [Company]> select * from emp where job = 'Research' and comm > 500;
+-------+---------+----------+------+------------+------+------+--------+
| empno | empname | job      | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+----------+------+------------+------+------+--------+
|  5883 | Jeffery | Research | 5817 | 2057-08-03 | 2236 |  549 |     20 |
|  9085 | Katie   | Research | 5919 | 1997-01-26 | 9065 | 1166 |     20 |
|  9487 | Amelia  | Research | 7940 | 2123-01-17 | 5905 | 1998 |     20 |
+-------+---------+----------+------+------------+------+------+--------+
3 rows in set (0.001 sec)

11. List employees belonging to department 20, 30, 40.

MariaDB [Company]> select * from emp where deptno in (20, 30, 40);
```

```
+-------+----------+------------+------+------------+-------+------+--------+
| empno | empname  | job        | mgr  | hiredate   | sal   | comm | deptno |
+-------+----------+------------+------+------------+-------+------+--------+
|  5595 | Isabella | Sales      | 8245 | 2075-09-10 |  3066 | 1545 |     30 |
|  5883 | Jeffery  | Research   | 5817 | 2057-08-03 |  2236 |  549 |     20 |
|  6880 | Cameron  | Sales      | 8245 | 2059-05-09 |  7636 | 1406 |     30 |
|  7235 | Stephen  | Operations | 2678 | 2083-00-31 |  6556 | 1698 |     40 |
|  7553 | Angel    | Sales      | 2678 | 2099-06-03 | 11316 |  983 |     30 |
|  9085 | Katie    | Research   | 5919 | 1997-01-26 |  9065 | 1166 |     20 |
|  9384 | Matilda  | Operations | 5817 | 2025-05-23 |  2494 | 1170 |     40 |
|  9487 | Amelia   | Research   | 7940 | 2123-01-17 |  5905 | 1998 |     20 |
+-------+----------+------------+------+------------+-------+------+--------+
8 rows in set (0.002 sec)

```

8.5 Set 5

```

1. List the employee names and his annual salary Job wise.

MariaDB [Company]> select job, empname, sal*12 as annual from emp;
+------------+----------+--------+
| job        | empname  | annual |
+------------+----------+--------+
| Sales      | Isabella |  36792 |
| Research   | Jeffery  |  26832 |
| Sales      | Cameron  |  91632 |
| Operations | Stephen  |  78672 |
| Sales      | Angel    | 135792 |
| PT         | Ramesh   |   6000 |
| PT         | Krish    |  24000 |
| Accounting | Mollie   |  47988 |
| Research   | Katie    | 108780 |
| Accounting | Jesse    |  42744 |
| Accounting | Isaiah   |  48000 |
| Operations | Matilda  |  29928 |
| Research   | Amelia   |  70860 |
+------------+----------+--------+
13 rows in set (0.001 sec)


2. Delete the Employee whose name starts with A & R

MariaDB [Company]> delete from emp where empname like 'A%' or empname like 'R%';
Query OK, 3 rows affected (0.002 sec)

3. Increment the salary of Emp no. 7000 by 30% of his current salary.

MariaDB [Company]> update emp set sal = sal + sal*0.3 where empno = 7000;
Query OK, 0 rows affected (0.001 sec)
Rows matched: 0  Changed: 0  Warnings: 0

4. List the total salary, maximum and minimum salary and average salary of the
    employees hire date wise.

MariaDB [Company]> select hiredate, sum(sal) as total, max(sal) as max, min(sal)
    as min, avg(sal) as avg from emp group by hiredate;
+------------+-------+------+------+-----------+
```

```
| hiredate   | total | max  | min  | avg       |
+------------+-------+------+------+-----------+
| 1997-01-26 |  9065 | 9065 | 9065 | 9065.0000 |
| 2015-02-09 |  3999 | 3999 | 3999 | 3999.0000 |
| 2023-12-12 |  2000 | 2000 | 2000 | 2000.0000 |
| 2025-05-23 |  2494 | 2494 | 2494 | 2494.0000 |
| 2057-08-03 |  2236 | 2236 | 2236 | 2236.0000 |
| 2059-05-09 |  7636 | 7636 | 7636 | 7636.0000 |
| 2075-09-10 |  3066 | 3066 | 3066 | 3066.0000 |
| 2083-00-31 |  6556 | 6556 | 6556 | 6556.0000 |
| 2101-08-22 |  3562 | 3562 | 3562 | 3562.0000 |
| 2101-09-03 |  4000 | 4000 | 4000 | 4000.0000 |
+------------+-------+------+------+-----------+
10 rows in set (0.001 sec)

5. List the employees whose names contains last letter as 'T'.

MariaDB [Company]> select * from emp where empname like '%T';
Empty set (0.001 sec)

6. Display the employees who have less salary as that of Ankush

MariaDB [Company]> select * from emp where sal < (select sal from emp where
    empname = 'Ankush');
Empty set (0.001 sec)

7. Display the employees who have salary between 10000

MariaDB [Company]> select * from emp where sal between 10000 and 20000;
Empty set (0.001 sec)

8. List employees belonging to department 30, 40, or 10.

MariaDB [Company]> select * from emp where deptno in (30, 40, 10);
+-------+----------+------------+------+------------+------+------+--------+
| empno | empname  | job        | mgr  | hiredate   | sal  | comm | deptno |
+-------+----------+------------+------+------------+------+------+--------+
|  5595 | Isabella | Sales      | 8245 | 2075-09-10 | 3066 | 1545 |     30 |
|  6880 | Cameron  | Sales      | 8245 | 2059-05-09 | 7636 | 1406 |     30 |
|  7235 | Stephen  | Operations | 2678 | 2083-00-31 | 6556 | 1698 |     40 |
|  8467 | Mollie   | Accounting | 5919 | 2015-02-09 | 3999 |  526 |     10 |
|  9180 | Jesse    | Accounting | 2678 | 2101-08-22 | 3562 | 1796 |     10 |
|  9360 | Isaiah   | Accounting | 7940 | 2101-09-03 | 4000 | 1390 |     10 |
|  9384 | Matilda  | Operations | 5817 | 2025-05-23 | 2494 | 1170 |     40 |
+-------+----------+------------+------+------------+------+------+--------+
7 rows in set (0.001 sec)

9. List the employees whose designation is 'Research' and sal is > 5000.

MariaDB [Company]> select * from emp where job = 'Research' and sal > 5000;
+-------+---------+----------+------+------------+------+------+--------+
| empno | empname | job      | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+----------+------+------------+------+------+--------+
|  9085 | Katie   | Research | 5919 | 1997-01-26 | 9065 | 1166 |     20 |
+-------+---------+----------+------+------------+------+------+--------+
1 row in set (0.001 sec)

10. List the employees details descending wise whose designation is 'Research' and
     commission is > 500.
```

```
MariaDB [Company]> select * from emp where job = 'Research' and comm > 500 order
    by comm desc;
+-------+---------+----------+------+------------+------+------+--------+
| empno | empname | job      | mgr  | hiredate   | sal  | comm | deptno |
+-------+---------+----------+------+------------+------+------+--------+
|  9085 | Katie   | Research | 5919 | 1997-01-26 | 9065 | 1166 |     20 |
|  5883 | Jeffery | Research | 5817 | 2057-08-03 | 2236 |  549 |     20 |
+-------+---------+----------+------+------------+------+------+--------+
2 rows in set (0.001 sec)
```

9 Conclusion

Thus, we have learned SQL DML commands, SELECT Command with SQL operators thoroughly.

10 FAQ

1. **What is the difference between Truncate table and Drop table command?**

   (a) *Truncate table command deletes all the records from the table and resets the identity column to 1.*

   (b) *Drop table command deletes the table and all the records from the table.*

   (c) *Truncate table command is faster than Drop table command.*

   (d) *Truncate table command cannot be rolled back.*

   (e) *Drop table command can be rolled back.*

   Example:

   (a) *Truncate table command*

   ```
   Truncate table CUSTOMERS;
   ```

   (b) *Drop table command*

   ```
   Drop table CUSTOMERS;
   ```

2. **How is the pattern matching done in the SQL?**

   (a) *The pattern matching is done using the LIKE operator.*

   (b) *The pattern matching is done using the wildcard characters.*

   (c) *The wildcard characters are:*

   - *% - Represents zero or more characters.*
   - *_ - Represents a single character.*
   - *[charlist] - Represents any single character in charlist.*

   The Syntax of the command is:

   ```
   SELECT column_name(s) FROM table_name WHERE column_name LIKE pattern;
   ```

   Example:

   ```
   SELECT * FROM CUSTOMERS WHERE CUST_NAME LIKE 'Emp%';
   SELECT * FROM STUDENTS WHERE CUST_NAME LIKE 'AssignmentNumber_';
   ```

3. **Write a DELETE command to delete all the records from CUSTOMERS table.**

   ```
   DELETE FROM CUSTOMERS;
   ```