Department Table:

DepartmentID	DepartmentName
1	HR
2	Finance
3	IT
4	Marketing
5	Sales
6	Operations
7	Research
8	Development
9	Customer Service
10	Administration

Employee Table:

EmployeeID	FirstName	LastName	Email	DepartmentID
101	John	Doe	john.doe@email.com	1
102	Jane	Smith	jane.smith@email.com	2
103	Robert	Johnson	robert.johnson@email.com	1
104	Mary	Jones	mary.jones@email.com	3
105	Michael	Brown	michael.brown@email.com	4
106	Jennifer	Davis	jennifer.davis@email.com	5
107	David	Martinez	david.martinez@email.com	6
108	Lisa	Rodriguez	lisa.rodriguez@email.com	7
109	William	Taylor	william.taylor@email.com	8
110	Sarah	Thomas	sarah.thomas@email.com	9

```
Setting environment for using XAMPP for Windows.
MITS@DESKTOP-NU9RV22 c:\xampp
# mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 9
Server version: 10.4.32-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE DATABASE S2MCA;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> USE S2MCA;
Database changed
```

1. Create tables named Department (with DepartmentID as primary key) and Employee (with EmployeeID as primary key and DepartmentID as foreign key).

```
MariaDB [S2MCA]> CREATE TABLE Department (
    -> DepartmentID int primary key,
    -> DepartmentName varchar(50)
    -> );
Query OK, 0 rows affected (0.007 sec)

MariaDB [S2MCA]> INSERT INTO Department VALUES
    ->      ('1','HR'),
    ->      ('2','Finance'),
    ->      ('3','IT'),
    ->      ('4','Marketing'),
    ->      ('5','Sales'),
    ->      ('6','Operations'),
    ->      ('7','Research'),
    ->      ('8','Development'),
    ->      ('9','Customer Service'),
    ->      ('10','Administration');
Query OK, 10 rows affected (0.002 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [S2MCA]> SELECT * FROM Department;
+--------------+-----------------+
| DepartmentID | DepartmentName  |
+--------------+-----------------+
|            1 | HR              |
|            2 | Finance         |
|            3 | IT              |
|            4 | Marketing       |
|            5 | Sales           |
|            6 | Operations      |
|            7 | Research        |
|            8 | Development     |
|            9 | Customer Service |
```

```
|          10 | Administration   |
+-------------+------------------+
10 rows in set (0.001 sec)

MariaDB [S2MCA]> CREATE TABLE Employee (
    ->      EmployeeID int primary key,
    ->      FirstName varchar(50),
    ->      LastName varchar(50),
    ->      Email varchar(50),
    ->      DepartmentID int,
    ->      foreign key (DepartmentID) references Department (DepartmentID)
    ->      );
Query OK, 0 rows affected (0.007 sec)

MariaDB [S2MCA]> INSERT INTO Employee
(EmployeeID,FirstName,LastName,Email,DepartmentID) VALUES
    ->      ('101','John','Doe','john.doe@Email.com','1'),
    ->      ('102','Jane','Smith','jane.smith@Email.com','2'),
    ->      ('103','Robert','Johnson','robert.johnson@Email.com','1'),
    ->      ('104','Mary','Jones','mary.jones@Email.com','3'),
    ->      ('105','Michael','Brown','michael.brown@Email.com','4'),
    ->      ('106','Jennifer','Davis','jennifer.davis@Email.com','5'),
    ->      ('107','David','Martinez','david.martinez@Email.com','6'),
    ->      ('108','Lisa','Rodriguez','lisa.rodriguez@Email.com','7'),
    ->      ('109','William','Taylor','william.taylor@Email.com','8'),
    ->      ('110','Sarah','Thomas','sarah.thomas@Email.com','9');
Query OK, 10 rows affected (0.002 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [S2MCA]> SELECT * FROM Employee;
+------------+-----------+-----------+-------------------------+--------------+
| EmployeeID | FirstName | LastName  | Email                   | DepartmentID |
+------------+-----------+-----------+-------------------------+--------------+
|        101 | John      | Doe       | john.doe@Email.com      |            1 |
|        102 | Jane      | Smith     | jane.smith@Email.com    |            2 |
|        103 | Robert    | Johnson   | robert.johnson@Email.com |            1 |
|        104 | Mary      | Jones     | mary.jones@Email.com    |            3 |
|        105 | Michael   | Brown     | michael.brown@Email.com |            4 |
|        106 | Jennifer  | Davis     | jennifer.davis@Email.com |            5 |
|        107 | David     | Martinez  | david.martinez@Email.com |            6 |
|        108 | Lisa      | Rodriguez | lisa.rodriguez@Email.com |            7 |
|        109 | William   | Taylor    | william.taylor@Email.com |            8 |
|        110 | Sarah     | Thomas    | sarah.thomas@Email.com  |            9 |
+------------+-----------+-----------+-------------------------+--------------+
10 rows in set (0.000 sec)
```

2. Add a new column named ‘Salary’ to the Employee table with the datatype DECIMAL(10,2).

```
MariaDB [S2MCA]> ALTER TABLE Employee ADD salary DECIMAL(10,2);
Query OK, 0 rows affected (0.003 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [S2MCA]> UPDATE Employee SET salary='65000.00' WHERE DepartmentID IN (1,4,5,6);
Query OK, 5 rows affected (0.002 sec)
```

```
Rows matched: 5  Changed: 5  Warnings: 0

MariaDB [S2MCA]> UPDATE Employee SET salary='76000.00' WHERE DepartmentID IN (2,3,7);
Query OK, 3 rows affected (0.002 sec)
Rows matched: 3  Changed: 3  Warnings: 0

MariaDB [S2MCA]> UPDATE Employee SET salary='40000.00' WHERE DepartmentID IN (9);
Query OK, 1 row affected (0.002 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [S2MCA]> UPDATE Employee SET salary='70000.00' WHERE DepartmentID IN (8,10);
Query OK, 1 row affected (0.001 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [S2MCA]> SELECT * FROM Employee;
+------------+-----------+-----------+-------------------------+--------------+----------+
| EmployeeID | FirstName | LastName  | Email                   | DepartmentID | salary   |
+------------+-----------+-----------+-------------------------+--------------+----------+
|        101 | John      | Doe       | john.doe@Email.com      |            1 | 65000.00 |
|        102 | Jane      | Smith     | jane.smith@Email.com    |            2 | 76000.00 |
|        103 | Robert    | Johnson   | robert.johnson@Email.com |            1 | 65000.00 |
|        104 | Mary      | Jones     | mary.jones@Email.com    |            3 | 76000.00 |
|        105 | Michael   | Brown     | michael.brown@Email.com |            4 | 65000.00 |
|        106 | Jennifer  | Davis     | jennifer.davis@Email.com |            5 | 65000.00 |
|        107 | David     | Martinez  | david.martinez@Email.com |            6 | 65000.00 |
|        108 | Lisa      | Rodriguez | lisa.rodriguez@Email.com |            7 | 76000.00 |
|        109 | William   | Taylor    | william.taylor@Email.com |            8 | 70000.00 |
|        110 | Sarah     | Thomas    | sarah.thomas@Email.com  |            9 | 40000.00 |
+------------+-----------+-----------+-------------------------+--------------+----------+
10 rows in set (0.000 sec)
```

3. Alter the Department table to rename the column ‘Departmentname’ to ‘DeptName’.

```
MariaDB [S2MCA]> ALTER TABLE Department CHANGE DepartmentName DeptName varchar(50);
Query OK, 0 rows affected (0.004 sec)
Records: 0  Duplicates: 0  Warnings: 0

MariaDB [S2MCA]> SELECT * FROM Department;

+--------------+------------------+
| DepartmentID | DeptName         |
+--------------+------------------+
|            1 | HR               |
|            2 | Finance          |
|            3 | IT               |
|            4 | Marketing        |
|            5 | Sales            |
|            6 | Operations       |
|            7 | Research         |
|            8 | Development      |
|            9 | Customer Service |
|           10 | Administration   |
+--------------+------------------+
10 rows in set (0.000 sec)
```

4. **Update the email of the employee with EmployeeID 102 to 'jane.smith@example.com'.**

```
MariaDB [S2MCA]> UPDATE Employee SET Email = 'jane.smith@example.com' WHERE EmployeeID
= 102;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1  Changed: 1  Warnings: 0

MariaDB [S2MCA]> SELECT * FROM Employee;
+------------+-----------+-----------+-------------------------+--------------+----------+
| EmployeeID | FirstName | LastName  | Email                   | DepartmentID | salary   |
+------------+-----------+-----------+-------------------------+--------------+----------+
|        101 | John      | Doe       | john.doe@Email.com      |            1 | 65000.00 |
|        102 | Jane      | Smith     | jane.smith@example.com  |            2 | 76000.00 |
|        103 | Robert    | Johnson   | robert.johnson@Email.com |            1 | 65000.00 |
|        104 | Mary      | Jones     | mary.jones@Email.com    |            3 | 76000.00 |
|        105 | Michael   | Brown     | michael.brown@Email.com |            4 | 65000.00 |
|        106 | Jennifer  | Davis     | jennifer.davis@Email.com |            5 | 65000.00 |
|        107 | David     | Martinez  | david.martinez@Email.com |            6 | 65000.00 |
|        108 | Lisa      | Rodriguez | lisa.rodriguez@Email.com |            7 | 76000.00 |
|        109 | William   | Taylor    | william.taylor@Email.com |            8 | 70000.00 |
|        110 | Sarah     | Thomas    | sarah.thomas@Email.com  |            9 | 40000.00 |
+------------+-----------+-----------+-------------------------+--------------+----------+
10 rows in set (0.000 sec)
```

5. **Provide an example of an INNER JOIN between the Employee table and the Department table on the common column "DepartmentID".**

```
MariaDB [S2MCA]> SELECT e.EmployeeID, e.FirstName, e.LastName, e.Email, e.Salary,
e.DepartmentID, d.DeptName FROM Employee e INNER JOIN Department d ON d.De
partmentID = e.DepartmentID;
+------------+-----------+-----------+-------------------------+----------+--------------+------------------+
| EmployeeID | FirstName | LastName  | Email                   | Salary   | DepartmentID | DeptName         |
+------------+-----------+-----------+-------------------------+----------+--------------+------------------+
|        101 | John      | Doe       | john.doe@Email.com      | 65000.00 |            1 | HR               |
|        102 | Jane      | Smith     | jane.smith@example.com  | 76000.00 |            2 | Finance          |
|        103 | Robert    | Johnson   | robert.johnson@Email.com | 65000.00 |            1 | HR               |
|        104 | Mary      | Jones     | mary.jones@Email.com    | 76000.00 |            3 | IT               |
|        105 | Michael   | Brown     | michael.brown@Email.com | 65000.00 |            4 | Marketing        |
|        106 | Jennifer  | Davis     | jennifer.davis@Email.com | 65000.00 |            5 | Sales            |
|        107 | David     | Martinez  | david.martinez@Email.com | 65000.00 |            6 | Operations       |
|        108 | Lisa      | Rodriguez | lisa.rodriguez@Email.com | 76000.00 |            7 | Research         |
|        109 | William   | Taylor    | william.taylor@Email.com | 70000.00 |            8 | Development      |
|        110 | Sarah     | Thomas    | sarah.thomas@Email.com  | 40000.00 |            9 | Customer Service |
+------------+-----------+-----------+-------------------------+----------+--------------+------------------+
10 rows in set (0.001 sec)
```

6. **Perform a LEFT JOIN between the Employee table and the Department table to display all employees regardless of whether they are assigned to a department or not.**

```
MariaDB [S2MCA]> SELECT e.DepartmentID, d.DeptName, e.EmployeeID, e.FirstName,
e.LastName, e.Email, e.Salary FROM Employee e LEFT JOIN Department d ON e.DepartmentID
= d.DepartmentID;
+--------------+-----------------+------------+-----------+-----------+-------------------------+----------+
| DepartmentID | DeptName        | EmployeeID | FirstName | LastName  | Email                   | Salary   |
```

```
+--------------+-----------------+------------+-----------+-----------+--------------------------+----------+
|            1 | HR              |        101 | John      | Doe       | john.doe@Email.com       | 65000.00 |
|            2 | Finance         |        102 | Jane      | Smith     | jane.smith@example.com   | 76000.00 |
|            1 | HR              |        103 | Robert    | Johnson   | robert.johnson@Email.com | 65000.00 |
|            3 | IT              |        104 | Mary      | Jones     | mary.jones@Email.com     | 76000.00 |
|            4 | Marketing       |        105 | Michael   | Brown     | michael.brown@Email.com  | 65000.00 |
|            5 | Sales           |        106 | Jennifer  | Davis     | jennifer.davis@Email.com | 65000.00 |
|            6 | Operations      |        107 | David     | Martinez  | david.martinez@Email.com | 65000.00 |
|            7 | Research        |        108 | Lisa      | Rodriguez | lisa.rodriguez@Email.com | 76000.00 |
|            8 | Development     |        109 | William   | Taylor    | william.taylor@Email.com | 70000.00 |
|            9 | Customer Service |        110 | Sarah     | Thomas    | sarah.thomas@Email.com   | 40000.00 |
+--------------+-----------------+------------+-----------+-----------+--------------------------+----------+
10 rows in set (0.001 sec)
```

7. Write a SQL query to calculate the total number of employees in each department.

```
MariaDB [S2MCA]> SELECT d.DepartmentID, d.DeptName, COUNT(e.EmployeeID) AS
Total_Employee FROM Department d LEFT JOIN Employee e ON d.DepartmentID = e.DepartmentID
GROUP BY d.DepartmentID, d.DeptName;
+--------------+-----------------+----------------+
| DepartmentID | DeptName        | Total_Employee |
+--------------+-----------------+----------------+
|            1 | HR              |              2 |
|            2 | Finance         |              1 |
|            3 | IT              |              1 |
|            4 | Marketing       |              1 |
|            5 | Sales           |              1 |
|            6 | Operations      |              1 |
|            7 | Research        |              1 |
|            8 | Development     |              1 |
|            9 | Customer Service |              1 |
|           10 | Administration  |              0 |
+--------------+-----------------+----------------+
10 rows in set (0.001 sec)
```

8. Retrieve the concatenation of the FirstName and LastName columns for all employees in the Employee table.

```
MariaDB [S2MCA]> SELECT CONCAT(FirstName, ' ', LastName) AS Full_Name FROM Employee;
+----------------+
| Full_Name      |
+----------------+
| John Doe       |
| Jane Smith     |
| Robert Johnson |
| Mary Jones     |
| Michael Brown  |
| Jennifer Davis |
| David Martinez |
| Lisa Rodriguez |
| William Taylor |
| Sarah Thomas   |
+----------------+
10 rows in set (0.002 sec)
```

9. **Write a query that uses the WHERE clause to select all employees whose FirstName is 'Jennifer'.**

```
MariaDB [S2MCA]> SELECT * FROM Employee WHERE FirstName = 'Jennifer';
+------------+-----------+----------+-------------------------+--------------+----------+
| EmployeeID | FirstName | LastName | Email                   | DepartmentID | salary   |
+------------+-----------+----------+-------------------------+--------------+----------+
|        106 | Jennifer  | Davis    | jennifer.davis@Email.com |            5 | 65000.00 |
+------------+-----------+----------+-------------------------+--------------+----------+
1 row in set (0.000 sec)
```

10. **Use the ORDER BY clause to sort the records in the Employee table based on the LastName column in ascending order.**

```
MariaDB [S2MCA]> SELECT * FROM Employee ORDER BY LastName ASC;
+------------+-----------+-----------+-------------------------+--------------+----------+
| EmployeeID | FirstName | LastName  | Email                   | DepartmentID | salary   |
+------------+-----------+-----------+-------------------------+--------------+----------+
|        105 | Michael   | Brown     | michael.brown@Email.com  |            4 | 65000.00 |
|        106 | Jennifer  | Davis     | jennifer.davis@Email.com |            5 | 65000.00 |
|        101 | John      | Doe       | john.doe@Email.com       |            1 | 65000.00 |
|        103 | Robert    | Johnson   | robert.johnson@Email.com |            1 | 65000.00 |
|        104 | Mary      | Jones     | mary.jones@Email.com     |            3 | 76000.00 |
|        107 | David     | Martinez  | david.martinez@Email.com |            6 | 65000.00 |
|        108 | Lisa      | Rodriguez | lisa.rodriguez@Email.com |            7 | 76000.00 |
|        102 | Jane      | Smith     | jane.smith@example.com   |            2 | 76000.00 |
|        109 | William   | Taylor    | william.taylor@Email.com |            8 | 70000.00 |
|        110 | Sarah     | Thomas    | sarah.thomas@Email.com   |            9 | 40000.00 |
+------------+-----------+-----------+-------------------------+--------------+----------+
10 rows in set (0.001 sec)
```

11. **Provide an example of using the LIKE operator to select all employees whose last names start with the letter 'S'.**

```
MariaDB [S2MCA]> SELECT * FROM Employee WHERE LastName LIKE 'S%';
+------------+-----------+----------+-------------------------+--------------+----------+
| EmployeeID | FirstName | LastName | Email                   | DepartmentID | salary   |
+------------+-----------+----------+-------------------------+--------------+----------+
|        102 | Jane      | Smith    | jane.smith@example.com |            2 | 76000.00 |
+------------+-----------+----------+-------------------------+--------------+----------+
1 row in set (0.001 sec)
```

12. **Write a query using the IN operator to select all employees whose DepartmentID is either 7, 8, or 9.**

```
MariaDB [S2MCA]> SELECT * FROM Employee WHERE DepartmentID IN (7, 8, 9);
+------------+-----------+-----------+-------------------------+--------------+----------+
| EmployeeID | FirstName | LastName  | Email                   | DepartmentID | salary   |
+------------+-----------+-----------+-------------------------+--------------+----------+
|        108 | Lisa      | Rodriguez | lisa.rodriguez@Email.com |            7 | 76000.00 |
|        109 | William   | Taylor    | william.taylor@Email.com |            8 | 70000.00 |
|        110 | Sarah     | Thomas    | sarah.thomas@Email.com   |            9 | 40000.00 |
+------------+-----------+-----------+-------------------------+--------------+----------+
3 rows in set (0.001 sec)
```