SQL   
Objective:

To create two tables (Customer and Employee), perform DDL and DML operations, and apply various types of joins and set operations.

Part 1: Table Creation and Data Manipulation

1. DDL Commands (Data Definition Language)

1. Create a table named Customer with the following structure:
   * CustID (INT, Primary Key)
   * CustName (VARCHAR(50), NOT NULL)
   * City (VARCHAR(30))
   * Age (INT)
   * Phone (VARCHAR(15))

CREATE TABLE Customer (

CustID INT PRIMARY KEY,

CustName VARCHAR(50) NOT NULL,

City VARCHAR(30),

Age INT,

Phone VARCHAR(15)

);

1. Create a table named Employee with the following structure:
   * EmpID (INT, Primary Key)
   * EmpName (VARCHAR(50), NOT NULL)
   * Department (VARCHAR(30))
   * Salary (DECIMAL(10,2))
   * City (VARCHAR(30))

CREATE TABLE Employee (

EmpID INT PRIMARY KEY,

EmpName VARCHAR(50) NOT NULL,

Department VARCHAR(30),

Salary DECIMAL(10,2),

City VARCHAR(30)

);

1. Modify the Employee table to add a new column: Email (VARCHAR(50)).

ALTER TABLE Employee ADD Email VARCHAR(50);

1. Rename the column CustName in the Customer table to CustomerName.

ALTER TABLE Customer RENAME COLUMN CustName TO CustomerName;

1. Drop the Age column from the Customer table.

ALTER TABLE Customer DROP COLUMN Age;

1. Add a CHECK constraint on the Salary column in the Employee table to ensure salary is greater than 0.

ALTER TABLE Employee

ADD CONSTRAINT chk\_salary CHECK (Salary > 0);

Questions

DML Commands (Data Manipulation Language)

1. Insert at least 5 records into the Customer table.

INSERT INTO Customer (CustID, CustomerName, City, Phone) VALUES

(1, 'Alice', 'Delhi', '9876543210'),

(2, 'Bob', 'Mumbai', '9876501234'),

(3, 'Charlie', 'Chennai', '9876512345'),

(4, 'David', 'Mumbai', '9876523456'),

(5, 'Eva', 'Kolkata', '9876534567');

1. Insert at least 5 records into the Employee table.

INSERT INTO Employee (EmpID, EmpName, Department, Salary, City, Email) VALUES

(101, 'John', 'HR', 45000, 'Mumbai', 'john@example.com'),

(102, 'Ravi', 'Finance', 60000, 'Delhi', 'ravi@example.com'),

(103, 'Sita', 'IT', 75000, 'Chennai', 'sita@example.com'),

(104, 'Arjun', 'Marketing', 40000, 'Pune', 'arjun@example.com'),

(105, 'Mary', 'Finance', 52000, 'Mumbai', 'mary@example.com');

1. Update the Phone number of the customer whose CustID is 1.

UPDATE Customer SET Phone = '9998887776' WHERE CustID = 1;

1. Change the Department of the employee named 'John' to 'Sales'.

UPDATE Employee SET Department = 'Sales' WHERE EmpName = 'John';

1. Delete the customer record where CustName is 'Alice'.

DELETE FROM Customer WHERE CustomerName = 'Alice';

1. Display all records from both Customer and Employee tables.

SELECT \* FROM Customer;

SELECT \* FROM Employee;

**Customer Table**

| **CustID** | **CustomerName** | **City** | **Phone** |
| --- | --- | --- | --- |
| 2 | Bob | Mumbai | 9876501234 |
| 3 | Charlie | Chennai | 9876512345 |
| 4 | David | Mumbai | 9876523456 |
| 5 | Eva | Kolkata | 9876534567 |

**Employee Table**

| **EmpID** | **EmpName** | **Department** | **Salary** | **City** | **Email** |
| --- | --- | --- | --- | --- | --- |
| 101 | John | Sales | 45000 | Mumbai | john@example.com |
| 102 | Ravi | Finance | 60000 | Delhi | ravi@example.com |
| 103 | Sita | IT | 75000 | Chennai | sita@example.com |
| 104 | Arjun | Marketing | 40000 | Pune | arjun@example.com |
| 105 | Mary | Finance | 52000 | Mumbai | mary@example.com |

1. Display only the names and cities of customers who live in 'Mumbai'.

SELECT CustomerName, City FROM Customer WHERE City = 'Mumbai';

| **CustomerName** | **City** |
| --- | --- |
| Bob | Mumbai |
| David | Mumbai |

1. Show all employees with a salary greater than 50,000.

SELECT \* FROM Employee WHERE Salary > 50000;

| **EmpID** | **EmpName** | **Department** | **Salary** | **City** | **Email** |
| --- | --- | --- | --- | --- | --- |
| 102 | Ravi | Finance | 60000 | Delhi | ravi@example.com |
| 103 | Sita | IT | 75000 | Chennai | sita@example.com |
| 105 | Mary | Finance | 52000 | Mumbai | mary@example.com |

1. Write a query to perform an INNER JOIN between Customer and Employee on the City column. Display CustomerName, City, EmpName, and Department.

SELECT c.CustomerName, c.City, e.EmpName, e.Department

FROM Customer c

INNER JOIN Employee e ON c.City = e.City;

| **CustomerName** | **City** | **EmpName** | **Department** |
| --- | --- | --- | --- |
| Bob | Mumbai | John | Sales |
| Bob | Mumbai | Mary | Finance |
| David | Mumbai | John | Sales |
| David | Mumbai | Mary | Finance |
| Charlie | Chennai | Sita | IT |

1. Perform a LEFT JOIN between Customer and Employee on City. Show all customers and matching employees (if any).

SELECT c.CustomerName, c.City, e.EmpName, e.Department

FROM Customer c

LEFT JOIN Employee e ON c.City = e.City;

| **CustomerName** | **City** | **EmpName** | **Department** |
| --- | --- | --- | --- |
| Bob | Mumbai | John | Sales |
| Bob | Mumbai | Mary | Finance |
| Charlie | Chennai | Sita | IT |
| David | Mumbai | John | Sales |
| David | Mumbai | Mary | Finance |
| Eva | Kolkata | NULL | NULL |

1. Perform a RIGHT JOIN between Customer and Employee on City. Show all employees and matching customers (if any).

SELECT c.CustomerName, c.City, e.EmpName, e.Department

FROM Customer c

RIGHT JOIN Employee e ON c.City = e.City;

| **CustomerName** | **City** | **EmpName** | **Department** |
| --- | --- | --- | --- |
| Bob | Mumbai | John | Sales |
| David | Mumbai | John | Sales |
| Bob | Mumbai | Mary | Finance |
| David | Mumbai | Mary | Finance |
| Charlie | Chennai | Sita | IT |
| NULL | Delhi | Ravi | Finance |
| NULL | Pune | Arjun | Marketing |

1. Perform a FULL OUTER JOIN between Customer and Employee on City. List all records from both tables.

SELECT c.CustomerName, c.City, e.EmpName, e.Department

FROM Customer c

FULL OUTER JOIN Employee e ON c.City = e.City;

1. Note: If your database (like MySQL) does not support FULL OUTER JOIN directly, write a query using UNION to simulate it.

SELECT c.CustomerName, c.City, e.EmpName, e.Department

FROM Customer c

LEFT JOIN Employee e ON c.City = e.City

UNION

SELECT c.CustomerName, c.City, e.EmpName, e.Department

FROM Customer c

RIGHT JOIN Employee e ON c.City = e.City;

| **CustomerName** | **City** | **EmpName** | **Department** |
| --- | --- | --- | --- |
| Bob | Mumbai | John | Sales |
| Bob | Mumbai | Mary | Finance |
| David | Mumbai | John | Sales |
| David | Mumbai | Mary | Finance |
| Charlie | Chennai | Sita | IT |
| Eva | Kolkata | NULL | NULL |
| NULL | Delhi | Ravi | Finance |
| NULL | Pune | Arjun | Marketing |

1. Perform a CROSS JOIN between Customer and Employee. How many rows are returned?

SELECT c.CustomerName, e.EmpName

FROM Customer c

CROSS JOIN Employee e;

4 Customers × 5 Employees = **20 rows**

| **CustomerName** | **EmpName** |
| --- | --- |
| Bob | John |
| Bob | Ravi |
| Bob | Sita |
| Bob | Arjun |
| Bob | Mary |
| Charlie | John |
| Charlie | Ravi |
| Charlie | Sita |
| Charlie | Arjun |
| Charlie | Mary |
| David | John |
| David | Ravi |
| David | Sita |
| David | Arjun |
| David | Mary |
| Eva | John |
| Eva | Ravi |
| Eva | Sita |
| Eva | Arjun |
| Eva | Mary |