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)
);
```

2. 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)
);
```

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

   ALTER TABLE Employee ADD Email VARCHAR(50);

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

   ALTER TABLE Customer RENAME COLUMN CustName TO CustomerName;

5. Drop the Age column from the Customer table.

   ALTER TABLE Customer DROP COLUMN Age;

6. 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)
7. 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');
```

8. 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');
```

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

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

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

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

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

```
DELETE FROM Customer WHERE CustomerName = 'Alice';
```

12. 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

13. 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

14. 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

15. 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

16. 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

17. 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

18. 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;
```

19. 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

20. 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