Task 5: SQL Joins (Inner, Left, Right, Full)

Objective:

Learn to combine data from multiple tables using various SQL JOIN types.

Tools:

- DB Browser for SQLite
- MySQL Workbench

Deliverables:

SQL queries using INNER JOIN, LEFT JOIN, RIGHT JOIN, and FULL JOIN.

Step 1: Create Sample Tables

```
-- Customers table
CREATE TABLE Customers (
    CustomerID INT PRIMARY KEY,
    Name VARCHAR(100),
    City VARCHAR(100)
);

-- Orders table
CREATE TABLE Orders (
    OrderID INT PRIMARY KEY,
    CustomerID INT,
    OrderDate DATE,
    Amount DECIMAL(10, 2),
    FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID)
);

-- Insert sample data
INSERT INTO Customers VALUES
(1, 'Alice', 'Delhi'),
(2, 'Bob', 'Mumbai'),
(3, 'Charlie', 'Chennai');

INSERT INTO Orders VALUES
(101, 1, '2023-01-01', 500.00),
(102, 1, '2023-02-01', 700.00),
(103, 2, '2023-03-01', 300.00);
```

Step 2: SQL JOINs Examples

1. INNER JOIN

```
SELECT Customers.Name, Orders.OrderID, Orders.Amount
```

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```
FROM Customers
INNER JOIN Orders ON Customers.CustomerID = Orders.CustomerID;
```

2. LEFT JOIN

```
SELECT Customers.Name, Orders.OrderID, Orders.Amount
FROM Customers
LEFT JOIN Orders ON Customers.CustomerID = Orders.CustomerID;
```

3. RIGHT JOIN

```
SELECT Customers.Name, Orders.OrderID, Orders.Amount
FROM Customers
RIGHT JOIN Orders ON Customers.CustomerID = Orders.CustomerID;
```

Note on RIGHT JOIN

```
SQLite does not support RIGHT JOIN directly. Use MySQL or emulate it using LEFT JOIN.
```

4. FULL OUTER JOIN

```
SELECT Customers.Name, Orders.OrderID, Orders.Amount
FROM Customers
FULL OUTER JOIN Orders ON Customers.CustomerID = Orders.CustomerID;
```

Note on FULL JOIN

```
FULL JOIN is not available in SQLite. Use a workaround with UNION:
```

FULL JOIN using UNION

```
SELECT Customers.Name, Orders.OrderID, Orders.Amount
FROM Customers
LEFT JOIN Orders ON Customers.CustomerID = Orders.CustomerID

UNION

SELECT Customers.Name, Orders.OrderID, Orders.Amount
FROM Customers
RIGHT JOIN Orders ON Customers.CustomerID = Orders.CustomerID;
```

Outcome:

```
- Understand how to combine data from multiple tables using different types of joins.
- Handle missing values and unmatched rows in join operations.
```