Title:

Implementation of Different Types of Joins

Intro:

In this lab assignment, we will explore various types of SQL joins. Joins are used to combine rows from two or more tables based on a related column between them. We will cover `INNER JOIN`, `LEFT JOIN`, `RIGHT JOIN`, and `FULL OUTER JOIN`, demonstrating their usage with examples.

Code:

Creating Tables:

```
sql
Copy code
CREATE TABLE Employees (
    EmployeeID INT PRIMARY KEY,
    FirstName VARCHAR(50),
    LastName VARCHAR(50),
    DepartmentID INT
);

CREATE TABLE Departments (
    DepartmentID INT PRIMARY KEY,
    DepartmentName VARCHAR(50)
);
```

Inserting Data:

```
sql
Copy code
INSERT INTO Employees (EmployeeID, FirstName, LastName, DepartmentID)
VALUES
(1, 'Alice', 'Brown', 1),
(2, 'Bob', 'Smith', 2),
(3, 'Charlie', 'Davis', 3),
```

```
(4, 'David', 'Wilson', NULL);

INSERT INTO Departments (DepartmentID, DepartmentName)
VALUES
(1, 'HR'),
(2, 'Engineering'),
(3, 'Marketing'),
(4, 'Sales');
```

INNER JOIN:

```
sql
Copy code
SELECT Employees.EmployeeID, Employees.FirstName, Employees.LastName,
Departments.DepartmentName
FROM Employees
INNER JOIN Departments ON Employees.DepartmentID =
Departments.DepartmentID;
```

LEFT JOIN:

```
sql
Copy code
SELECT Employees.EmployeeID, Employees.FirstName, Employees.LastName,
Departments.DepartmentName
FROM Employees
LEFT JOIN Departments ON Employees.DepartmentID =
Departments.DepartmentID;
```

RIGHT JOIN:

```
sql
Copy code
SELECT Employees.EmployeeID, Employees.FirstName, Employees.LastName,
Departments.DepartmentName
FROM Employees
RIGHT JOIN Departments ON Employees.DepartmentID =
```

```
Departments.DepartmentID;
```

FULL OUTER JOIN:

```
sql
Copy code
SELECT Employees.EmployeeID, Employees.FirstName, Employees.LastName,
Departments.DepartmentName
FROM Employees
FULL OUTER JOIN Departments ON Employees.DepartmentID =
Departments.DepartmentID;
```

Output:

INNER JOIN:

EmployeeID	FirstName	LastName	DepartmentName
1	Alice	Brown	HR
2	Bob	Smith	Engineering
3	Charlie	Davis	Marketing

LEFT JOIN:

EmployeeID	FirstName	LastName	DepartmentName
1	Alice	Brown	HR
2	Bob	Smith	Engineering
3	Charlie	Davis	Marketing
4	David	Wilson	NULL

RIGHT JOIN:

EmployeeID	FirstName	LastName	DepartmentName
1	Alice	Brown	HR
2	Bob	Smith	Engineering
3	Charlie	Davis	Marketing

NULL	NULL	NULL	Sales

FULL OUTER JOIN:

EmployeeID	FirstName	LastName	DepartmentName
1	Alice	Brown	HR
2	Bob	Smith	Engineering
3	Charlie	Davis	Marketing
4	David	Wilson	NULL
NULL	NULL	NULL	Sales

Conclusion:

In this lab, we demonstrated the use of different types of SQL joins. The `INNER JOIN` retrieves records that have matching values in both tables. The `LEFT JOIN` returns all records from the left table and the matched records from the right table, with NULLs in the unmatched right side. The `RIGHT JOIN` returns all records from the right table and the matched records from the left table, with NULLs in the unmatched left side. The `FULL OUTER JOIN` returns all records when there is a match in either left or right table. Understanding these joins is essential for combining data from multiple tables effectively.