

SQL JOIN

SQL JOIN clause is used to query and access data from multiple tables by establishing logical relationships between them.

➤ Inner Join:

- Returns only the rows where there is a match in both tables.
- Example:
 - SELECT *
 - FROM TableA
 - **INNER JOIN**
 - TableB
 - **ON** TableA.column = TableB.column;

➤ Left (Outer) Join:

- Returns all rows from the left table and the matched rows from the right table. If there is no match, NULL values are returned for columns from the right table.
- Example:
 - SELECT *
 - FROM TableA
 - **LEFT JOIN**
 - TableB
 - **ON** TableA.column = TableB.column;

➤ Right (Outer) Join:

- Returns all rows from the right table and the matched rows from the left table. If there is no match, NULL values are returned for columns from the left table.
- Example:
 - SELECT *
 - FROM TableA
 - **RIGHT JOIN**
 - TableB
 - **ON** TableA.column = TableB.column;

➤ **Full (Outer) Join:**

- Returns rows when there is a match in one of the tables. It returns all rows from the left table and the right table, filling in NULLs where there is no match.
- Example:
 - SELECT *
 - FROM TableA
 - **FULL OUTER JOIN**
 - TableB
 - **ON** TableA.column = TableB.column;

➤ **Cross Join:**

- Returns the Cartesian product of the two tables, i.e., every row in the first table is combined with every row in the second table.
- Example:
 - SELECT *
 - FROM TableA
 - **CROSS JOIN**
 - TableB;

➤ **Self Join:**

- A join in which a table is joined with itself. It's useful for comparing rows within the same table.
- Example:
 - SELECT A.column1, B.column2
 - FROM TableA A, TableA B
 - WHERE A.column = B.column;

EXAMPLES:-

```
mysql> create database joins;
```

Query OK, 1 row affected (0.05 sec)

```
mysql> use joins;
```

Database changed

```
mysql> CREATE TABLE Employees (
```

```
-> EmployeeID INT PRIMARY KEY,
```

```
-> Name VARCHAR(50),
```

```
-> DepartmentID INT
```

```
-> );
```

Query OK, 0 rows affected (0.09 sec)

```
mysql> INSERT INTO Employees (EmployeeID, Name, DepartmentID) VALUES
```

```
-> (1, 'Alice', 101),
```

```
-> (2, 'Bob', 102),
```

```
-> (3, 'Charlie', 103),
```

```
-> (4, 'David', NULL);
```

Query OK, 4 rows affected (0.02 sec)

Records: 4 Duplicates: 0 Warnings: 0

```
mysql> CREATE TABLE Departments (
```

```
-> DepartmentID INT PRIMARY KEY,
```

```
-> DepartmentName VARCHAR(50)
```

```
-> );
```

Query OK, 0 rows affected (0.03 sec)

```
mysql> INSERT INTO Departments (DepartmentID, DepartmentName) VALUES
```

```
-> (101, 'HR'),
```

```
-> (102, 'IT'),
```

```
-> (104, 'Marketing');
```

```
Query OK, 3 rows affected (0.01 sec)
```

```
Records: 3 Duplicates: 0 Warnings: 0
```

```
mysql> select * from Employees;
```

```
+-----+-----+-----+
| EmployeeID | Name   | DepartmentID |
+-----+-----+-----+
| 1 | Alice | 101 |
| 2 | Bob   | 102 |
| 3 | Charlie | 103 |
| 4 | David | NULL |
+-----+-----+-----+
```

```
4 rows in set (0.00 sec)
```

```
mysql> select * from Departments;
```

```
+-----+-----+
| DepartmentID | DepartmentName |
+-----+-----+
| 101          | HR              |
| 102          | IT              |
| 104          | Marketing       |
+-----+-----+
```

3 rows in set (0.00 sec)

```
mysql> select Employees.Name as employee,Departments.DepartmentN
```

```
ame as department
```

```
-> from Employees
```

```
-> INNER JOIN
```

```
-> Departments
```

```
-> ON Employees.DepartmentID=Departments.DepartmentID;
```

```
+-----+-----+
```

```
| employee | department |
```

```
+-----+-----+
```

```
| Alice   | HR        |
```

```
| Bob     | IT        |
```

```
+-----+-----+
```

2 rows in set (0.00 sec)

```
mysql> select Employees.Name as employee ,Departments.DepartmentName as department
```

```
-> from Employees
```

```
-> LEFT JOIN
```

```
-> Departments
```

```
-> ON Employees.DepartmentID=Departments.DepartmentID;
```

```
+-----+-----+
```

```
| employee | department |
```

```
+-----+-----+
```

```
| Alice   | HR        |
```

```
| Bob     | IT        |
```

```
| Charlie | NULL      |
```

David	NULL
-------	------

+-----+-----+

4 rows in set (0.00 sec)

```
mysql> select Employees.Name as employee ,Departments.Department
Name
```

-> from Employees

-> RIGHT JOIN

-> Departments

-> ON Employees.DepartmentID=Departments.DepartmentID;

+-----+-----+

employee	DepartmentName
----------	----------------

+-----+-----+

Alice	HR
-------	----

Bob	IT
-----	----

NULL	Marketing
------	-----------

+-----+-----+

3 rows in set (0.00 sec)

```
mysql> SELECT Employees.Name, Departments.DepartmentName
```

-> FROM Employees

-> CROSS JOIN

-> Departments

-> ON Employees.DepartmentID=Departments.DepartmentID;

+-----+-----+

Name	DepartmentName
------	----------------

+-----+-----+

Alice	HR
-------	----

Bob	IT
-----	----

+-----+-----+

2 rows in set (0.00 sec)

```
mysql> select Employees.Name as employee ,Departments.DepartmentName
```

```
-> from Employees
```

```
-> CROSS JOIN
```

```
-> Departments;
```

+-----+-----+

employee	DepartmentName
----------	----------------

+-----+-----+

Alice	Marketing
-------	-----------

Alice	IT
-------	----

Alice	HR
-------	----

Bob	Marketing
-----	-----------

Bob	IT
-----	----

Bob	HR
-----	----

Charlie	Marketing
---------	-----------

Charlie	IT
---------	----

Charlie	HR
---------	----

David	Marketing
-------	-----------

David	IT
-------	----

David	HR
-------	----

+-----+-----+

12 rows in set (0.00 sec)

```
mysql> SELECT Employees.Name, Departments.DepartmentName
```

```
-> FROM Employees
```

-> **LEFT JOIN** Departments **ON** Employees.DepartmentID = Departments.DepartmentID

->

-> **UNION**

->

-> **SELECT** Employees.Name, Departments.DepartmentName

-> **FROM** Employees

-> **RIGHT JOIN** Departments **ON** Employees.DepartmentID =
Departments.DepartmentID;

```
+-----+-----+  
| Name  | DepartmentName |
```

```
+-----+-----+
```

```
| Alice | HR          |
```

```
| Bob   | IT          |
```

```
| Charlie | NULL       |
```

```
| David  | NULL       |
```

```
| NULL   | Marketing   |
```

```
+-----+-----+
```

5 rows in set (0.01 sec)

SELF JOIN:-

```
mysql> sELECT E1.Name AS Employee1, E2.Name AS Employee2, E1.DepartmentID
```

-> **FROM** Employees E1, Employees E2

-> **WHERE** E1.DepartmentID = E2.DepartmentID AND E1.EmployeeID <>
E2.EmployeeID;

Empty set (0.01 sec)

```
mysql> insert into Employees value(5,'Eswanth',101);
```


Query OK, 1 row affected (0.02 sec)

```
mysql> sELECT E1.Name AS Employee1, E2.Name AS Employee2, E1.DepartmentID
```

```
-> FROM Employees E1, Employees E2
```

```
-> WHERE E1.DepartmentID = E2.DepartmentID AND E1.EmployeeID <>  
E2.EmployeeID;
```

```
+-----+-----+-----+  
| Employee1 | Employee2 | DepartmentID |
```

```
+-----+-----+-----+
```

```
| Eswanth | Alice | 101 |
```

```
| Alice | Eswanth | 101 |
```

```
+-----+-----+-----+
```

2 rows in set (0.00 sec)