SQL **Joins** clause is used to combine records from two or more tables in a database. A JOIN is a means for combining fields from two tables by using values common to each.

Consider the following two tables −

**Table 1** − CUSTOMERS Table

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

| ID | NAME | AGE | ADDRESS | SALARY |

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

| 1 | Ramesh | 32 | Ahmedabad | 2000.00 |

| 2 | Khilan | 25 | Delhi | 1500.00 |

| 3 | kaushik | 23 | Kota | 2000.00 |

| 4 | Chaitali | 25 | Mumbai | 6500.00 |

| 5 | Hardik | 27 | Bhopal | 8500.00 |

| 6 | Komal | 22 | MP | 4500.00 |

| 7 | Muffy | 24 | Indore | 10000.00 |

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

**Table 2** − ORDERS Table

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

|OID | DATE | CUSTOMER\_ID | AMOUNT |

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

| 102 | 2009-10-08 00:00:00 | 3 | 3000 |

| 100 | 2009-10-08 00:00:00 | 3 | 1500 |

| 101 | 2009-11-20 00:00:00 | 2 | 1560 |

| 103 | 2008-05-20 00:00:00 | 4 | 2060 |

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

Now, let us join these two tables in our SELECT statement as shown below.

SQL> SELECT ID, NAME, AGE, AMOUNT

FROM CUSTOMERS, ORDERS

WHERE CUSTOMERS.ID = ORDERS.CUSTOMER\_ID;

This would produce the following result.

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

| ID | NAME | AGE | AMOUNT |

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

| 3 | kaushik | 23 | 3000 |

| 3 | kaushik | 23 | 1500 |

| 2 | Khilan | 25 | 1560 |

| 4 | Chaitali | 25 | 2060 |

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

Here, it is noticeable that the join is performed in the WHERE clause. Several operators can be used to join tables, such as =, <, >, <>, <=, >=, !=, BETWEEN, LIKE, and NOT; they can all be used to join tables. However, the most common operator is the equal to symbol.

There are different types of joins available in SQL −

* INNER JOIN − returns rows when there is a match in both tables.
* LEFT JOIN − returns all rows from the left table, even if there are no matches in the right table.
* RIGHT JOIN − returns all rows from the right table, even if there are no matches in the left table.
* FULL JOIN − returns rows when there is a match in one of the tables.
* SELF JOIN − is used to join a table to itself as if the table were two tables, temporarily renaming at least one table in the SQL statement.
* CARTESIAN JOIN − returns the Cartesian product of the sets of records from the two or more joined tables.

INNER JOIN

Example

Consider the following two tables.

**Table 1** − CUSTOMERS Table is as follows.

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

| ID | NAME | AGE | ADDRESS | SALARY |

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

| 1 | Ramesh | 32 | Ahmedabad | 2000.00 |

| 2 | Khilan | 25 | Delhi | 1500.00 |

| 3 | kaushik | 23 | Kota | 2000.00 |

| 4 | Chaitali | 25 | Mumbai | 6500.00 |

| 5 | Hardik | 27 | Bhopal | 8500.00 |

| 6 | Komal | 22 | MP | 4500.00 |

| 7 | Muffy | 24 | Indore | 10000.00 |

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

**Table 2** − ORDERS Table is as follows.

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

| OID | DATE | CUSTOMER\_ID | AMOUNT |

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

| 102 | 2009-10-08 00:00:00 | 3 | 3000 |

| 100 | 2009-10-08 00:00:00 | 3 | 1500 |

| 101 | 2009-11-20 00:00:00 | 2 | 1560 |

| 103 | 2008-05-20 00:00:00 | 4 | 2060 |

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

Now, let us join these two tables using the INNER JOIN as follows −

SQL> SELECT ID, NAME, AMOUNT, DATE

FROM CUSTOMERS

INNER JOIN ORDERS

ON CUSTOMERS.ID = ORDERS.CUSTOMER\_ID;

LEFT JOIN

Example

Consider the following two tables,

**Table 1** − CUSTOMERS Table is as follows.

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

| ID | NAME | AGE | ADDRESS | SALARY |

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

| 1 | Ramesh | 32 | Ahmedabad | 2000.00 |

| 2 | Khilan | 25 | Delhi | 1500.00 |

| 3 | kaushik | 23 | Kota | 2000.00 |

| 4 | Chaitali | 25 | Mumbai | 6500.00 |

| 5 | Hardik | 27 | Bhopal | 8500.00 |

| 6 | Komal | 22 | MP | 4500.00 |

| 7 | Muffy | 24 | Indore | 10000.00 |

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

**Table 2** − Orders Table is as follows.

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

| OID | DATE | CUSTOMER\_ID | AMOUNT |

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

| 102 | 2009-10-08 00:00:00 | 3 | 3000 |

| 100 | 2009-10-08 00:00:00 | 3 | 1500 |

| 101 | 2009-11-20 00:00:00 | 2 | 1560 |

| 103 | 2008-05-20 00:00:00 | 4 | 2060 |

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

Now, let us join these two tables using the LEFT JOIN as follows.

SQL> SELECT ID, NAME, AMOUNT, DATE

FROM CUSTOMERS

LEFT JOIN ORDERS

ON CUSTOMERS.ID = ORDERS.CUSTOMER\_ID;

RIGHT JOIN

Example

Consider the following two tables,

**Table 1** − CUSTOMERS Table is as follows.

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

| ID | NAME | AGE | ADDRESS | SALARY |

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

| 1 | Ramesh | 32 | Ahmedabad | 2000.00 |

| 2 | Khilan | 25 | Delhi | 1500.00 |

| 3 | kaushik | 23 | Kota | 2000.00 |

| 4 | Chaitali | 25 | Mumbai | 6500.00 |

| 5 | Hardik | 27 | Bhopal | 8500.00 |

| 6 | Komal | 22 | MP | 4500.00 |

| 7 | Muffy | 24 | Indore | 10000.00 |

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

**Table 2** − ORDERS Table is as follows.

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

|OID | DATE | CUSTOMER\_ID | AMOUNT |

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

| 102 | 2009-10-08 00:00:00 | 3 | 3000 |

| 100 | 2009-10-08 00:00:00 | 3 | 1500 |

| 101 | 2009-11-20 00:00:00 | 2 | 1560 |

| 103 | 2008-05-20 00:00:00 | 4 | 2060 |

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

Now, let us join these two tables using the RIGHT JOIN as follows.

SQL> SELECT ID, NAME, AMOUNT, DATE

FROM CUSTOMERS

RIGHT JOIN ORDERS

ON CUSTOMERS.ID = ORDERS.CUSTOMER\_ID;

FULL OUTER JOIN

Example

Consider the following two tables.

**Table 1** − CUSTOMERS Table is as follows.

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

| ID | NAME | AGE | ADDRESS | SALARY |

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

| 1 | Ramesh | 32 | Ahmedabad | 2000.00 |

| 2 | Khilan | 25 | Delhi | 1500.00 |

| 3 | kaushik | 23 | Kota | 2000.00 |

| 4 | Chaitali | 25 | Mumbai | 6500.00 |

| 5 | Hardik | 27 | Bhopal | 8500.00 |

| 6 | Komal | 22 | MP | 4500.00 |

| 7 | Muffy | 24 | Indore | 10000.00 |

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

**Table 2** − ORDERS Table is as follows.

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

|OID | DATE | CUSTOMER\_ID | AMOUNT |

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

| 102 | 2009-10-08 00:00:00 | 3 | 3000 |

| 100 | 2009-10-08 00:00:00 | 3 | 1500 |

| 101 | 2009-11-20 00:00:00 | 2 | 1560 |

| 103 | 2008-05-20 00:00:00 | 4 | 2060 |

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

Now, let us join these two tables using FULL JOIN as follows.

SQL> SELECT ID, NAME, AMOUNT, DATE

FROM CUSTOMERS

FULL JOIN ORDERS

ON CUSTOMERS.ID = ORDERS.CUSTOMER\_ID;

This would produce the following result −

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

| ID | NAME | AMOUNT | DATE |

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

| 1 | Ramesh | NULL | NULL |

| 2 | Khilan | 1560 | 2009-11-20 00:00:00 |

| 3 | kaushik | 3000 | 2009-10-08 00:00:00 |

| 3 | kaushik | 1500 | 2009-10-08 00:00:00 |

| 4 | Chaitali | 2060 | 2008-05-20 00:00:00 |

| 5 | Hardik | NULL | NULL |

| 6 | Komal | NULL | NULL |

| 7 | Muffy | NULL | NULL |

| 3 | kaushik | 3000 | 2009-10-08 00:00:00 |

| 3 | kaushik | 1500 | 2009-10-08 00:00:00 |

| 2 | Khilan | 1560 | 2009-11-20 00:00:00 |

| 4 | Chaitali | 2060 | 2008-05-20 00:00:00 |

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

SELF JOIN

Example

Consider the following table.

**CUSTOMERS Table** is as follows.

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

| ID | NAME | AGE | ADDRESS | SALARY |

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

| 1 | Ramesh | 32 | Ahmedabad | 2000.00 |

| 2 | Khilan | 25 | Delhi | 1500.00 |

| 3 | kaushik | 23 | Kota | 2000.00 |

| 4 | Chaitali | 25 | Mumbai | 6500.00 |

| 5 | Hardik | 27 | Bhopal | 8500.00 |

| 6 | Komal | 22 | MP | 4500.00 |

| 7 | Muffy | 24 | Indore | 10000.00 |

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

Now, let us join this table using SELF JOIN as follows −

SQL> SELECT a.ID, b.NAME, a.SALARY

FROM CUSTOMERS a, CUSTOMERS b

WHERE a.SALARY < b.SALARY;

CARTISAN PRODUCT

Example

Consider the following two tables.

**Table 1** − CUSTOMERS table is as follows.

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

| ID | NAME | AGE | ADDRESS | SALARY |

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

| 1 | Ramesh | 32 | Ahmedabad | 2000.00 |

| 2 | Khilan | 25 | Delhi | 1500.00 |

| 3 | kaushik | 23 | Kota | 2000.00 |

| 4 | Chaitali | 25 | Mumbai | 6500.00 |

| 5 | Hardik | 27 | Bhopal | 8500.00 |

| 6 | Komal | 22 | MP | 4500.00 |

| 7 | Muffy | 24 | Indore | 10000.00 |

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

Table 2: ORDERS Table is as follows −

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

|OID | DATE | CUSTOMER\_ID | AMOUNT |

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

| 102 | 2009-10-08 00:00:00 | 3 | 3000 |

| 100 | 2009-10-08 00:00:00 | 3 | 1500 |

| 101 | 2009-11-20 00:00:00 | 2 | 1560 |

| 103 | 2008-05-20 00:00:00 | 4 | 2060 |

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

Now, let us join these two tables using CARTESIAN JOIN as follows −

SQL> SELECT ID, NAME, AMOUNT, DATE

FROM CUSTOMERS, ORDERS;