## **SQL JOIN**

A JOIN clause is used to combine rows from two or more tables, based on a related column between them.

## **Different Types of SQL JOINs**

Here are the different types of the JOINs in SQL:

* **(INNER) JOIN**: Returns records that have matching values in both tables
* **LEFT (OUTER) JOIN**: Returns all records from the left table, and the matched records from the right table
* **RIGHT (OUTER) JOIN**: Returns all records from the right table, and the matched records from the left table
* **FULL (OUTER) JOIN**: Returns all records when there is a match in either left or right table



mysql> use universe;

Database changed

mysql> show tables;

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

| Tables\_in\_universe |

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

| pluto |

| solar |

| ubank |

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

3 rows in set (0.02 sec)

mysql> create table customer(id int(2) AUTO\_INCREMENT PRIMARY KEY,name varchar(10),age int(2),address varchar(25),salary double(8,2),fav int(3));

Query OK, 0 rows affected (0.02 sec)

mysql> desc customer;

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

| Field | Type | Null | Key | Default | Extra |

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

| id | int(2) | NO | PRI | NULL | auto\_increment |

| name | varchar(10) | YES | | NULL | |

| age | int(2) | YES | | NULL | |

| address | varchar(25) | YES | | NULL | |

| salary | double(8,2) | YES | | NULL | |

| fav | int(3) | YES | | NULL | |

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

6 rows in set (0.02 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Akash',22,'Kphb-5,Road-3,Block32',25000,121);

Query OK, 1 row affected (0.01 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Bharath',23,'Kphb-6,Road-2,Block22',30000,151);

Query OK, 1 row affected (0.00 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Harish',24,'Kphb-2,Road-1,Block12',33000,111);

Query OK, 1 row affected (0.00 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Kishan',25,'Kphb-1,Road-3,Block15',27000,109);

Query OK, 1 row affected (0.00 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Madhavi',23,'Kphb-3,Road-6,Block17',37000,143);

Query OK, 1 row affected (0.00 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Praveen',26,'Kphb-7,Road-5,Block35',40000,129);

Query OK, 1 row affected (0.00 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Subbu',24,'Kphb-8,Road-4,Block37',47000,151);

Query OK, 1 row affected (0.00 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Nikhita',23,'Kphb-9,Road-7,Block27',50000,171);

Query OK, 1 row affected (0.00 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Lekhana',24,'Kphb-7,Road-3,Block34',55000,163);

Query OK, 1 row affected (0.00 sec)

mysql> insert into customer(name,age,address,salary,fav) values('Shiva',25,'Kphb-3,Road-7,Block44',45000,133);

Query OK, 1 row affected (0.00 sec)

mysql> select \* from customer;

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

| id | name | age | address | salary | fav |

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

| 1 | Akash | 22 | Kphb-5,Road-3,Block32 | 25000.00 | 121 |

| 2 | Bharath | 23 | Kphb-6,Road-2,Block22 | 30000.00 | 151 |

| 3 | Harish | 24 | Kphb-2,Road-1,Block12 | 33000.00 | 111 |

| 4 | Kishan | 25 | Kphb-1,Road-3,Block15 | 27000.00 | 109 |

| 5 | Madhavi | 23 | Kphb-3,Road-6,Block17 | 37000.00 | 143 |

| 6 | Praveen | 26 | Kphb-7,Road-5,Block35 | 40000.00 | 129 |

| 7 | Subbu | 24 | Kphb-8,Road-4,Block37 | 47000.00 | 151 |

| 8 | Nikhita | 23 | Kphb-9,Road-7,Block27 | 50000.00 | 171 |

| 9 | Lekhana | 24 | Kphb-7,Road-3,Block34 | 55000.00 | 163 |

| 10 | Shiva | 25 | Kphb-3,Road-7,Block44 | 45000.00 | 133 |

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

10 rows in set (0.00 sec)

mysql> show tables;

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

| Tables\_in\_universe |

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

| customer |

| pluto |

| solar |

| ubank |

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

4 rows in set (0.00 sec)

mysql> create table product(id int(2) AUTO\_INCREMENT PRIMARY KEY,pid int(3),pname varchar(15),pdate DATE NOT NULL,amount double(8,2));

Query OK, 0 rows affected (0.01 sec)

mysql> desc product;

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

| Field | Type | Null | Key | Default | Extra |

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

| id | int(2) | NO | PRI | NULL | auto\_increment |

| pid | int(3) | YES | | NULL | |

| pname | varchar(15) | YES | | NULL | |

| pdate | date | NO | | NULL | |

| amount | double(8,2) | YES | | NULL | |

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

5 rows in set (0.02 sec)

mysql> insert into product(pid,pname,pdate,amount) values(111,'Amul-Choco','2020-09-28',390);

Query OK, 1 row affected (0.00 sec)

mysql> insert into product(pid,pname,pdate,amount) values(151,'Black-Current','2020-09-26',470);

Query OK, 1 row affected (0.01 sec)

mysql> insert into product(pid,pname,pdate,amount) values(155,'Alexa','2020-08-15',790);

Query OK, 1 row affected (0.00 sec)

mysql> insert into product(pid,pname,pdate,amount) values(171,'SundayBlock','2020-07-21',1290);

Query OK, 1 row affected (0.00 sec)

mysql> insert into product(pid,pname,pdate,amount) values(109,'FruitDelight','2020-09-12',170);

Query OK, 1 row affected (0.01 sec)

mysql> insert into product(pid,pname,pdate,amount) values(161,'Iphone','2020-09-24',75000);

Query OK, 1 row affected (0.00 sec)

mysql> insert into product(pid,pname,pdate,amount) values(143,'Samsung','2020-07-19',4590);

Query OK, 1 row affected (0.00 sec)

mysql> select \* from product;

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

| id | pid | pname | pdate | amount |

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

| 1 | 111 | Amul-Choco | 2020-09-28 | 390.00 |

| 2 | 151 | Black-Current | 2020-09-26 | 470.00 |

| 3 | 155 | Alexa | 2020-08-15 | 790.00 |

| 4 | 171 | SundayBlock | 2020-07-21 | 1290.00 |

| 5 | 109 | FruitDelight | 2020-09-12 | 170.00 |

| 6 | 161 | Iphone | 2020-09-24 | 75000.00 |

| 7 | 143 | Samsung | 2020-07-19 | 4590.00 |

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

7 rows in set (0.00 sec)

mysql> select \* from customer;

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

| id | name | age | address | salary | fav |

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

| 1 | Akash | 22 | Kphb-5,Road-3,Block32 | 25000.00 | 121 |

| 2 | Bharath | 23 | Kphb-6,Road-2,Block22 | 30000.00 | 151 |

| 3 | Harish | 24 | Kphb-2,Road-1,Block12 | 33000.00 | 111 |

| 4 | Kishan | 25 | Kphb-1,Road-3,Block15 | 27000.00 | 109 |

| 5 | Madhavi | 23 | Kphb-3,Road-6,Block17 | 37000.00 | 143 |

| 6 | Praveen | 26 | Kphb-7,Road-5,Block35 | 40000.00 | 129 |

| 7 | Subbu | 24 | Kphb-8,Road-4,Block37 | 47000.00 | 151 |

| 8 | Nikhita | 23 | Kphb-9,Road-7,Block27 | 50000.00 | 171 |

| 9 | Lekhana | 24 | Kphb-7,Road-3,Block34 | 55000.00 | 163 |

| 10 | Shiva | 25 | Kphb-3,Road-7,Block44 | 45000.00 | 133 |

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

10 rows in set (0.00 sec)

mysql> select \

-> customer.name as DataSet, \

-> product.pname as ProductList \

-> from customer \

-> INNER JOIN product ON customer.fav = product.pid;

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

| DataSet | ProductList |

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

| Bharath | Black-Current |

| Harish | Amul-Choco |

| Kishan | FruitDelight |

| Madhavi | Samsung |

| Subbu | Black-Current |

| Nikhita | SundayBlock |

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

6 rows in set (0.01 sec)

mysql> select \

-> customer.name as DataSet, \

-> customer.age as Age, \

-> product.pname as ProductList \

-> from customer \

-> INNER JOIN product ON customer.fav = product.pid;

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

| DataSet | Age | ProductList |

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

| Bharath | 23 | Black-Current |

| Harish | 24 | Amul-Choco |

| Kishan | 25 | FruitDelight |

| Madhavi | 23 | Samsung |

| Subbu | 24 | Black-Current |

| Nikhita | 23 | SundayBlock |

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

6 rows in set (0.00 sec)

mysql> select \

-> customer.name as DataSet, \

-> customer.age as Age, \

-> product.pname as ProductList, \

-> product.pdate as Date, \

-> product.amount as Cost \

-> from customer \

-> INNER JOIN product ON customer.fav = product.pid;

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

| DataSet | Age | ProductList | Date | Cost |

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

| Bharath | 23 | Black-Current | 2020-09-26 | 470.00 |

| Harish | 24 | Amul-Choco | 2020-09-28 | 390.00 |

| Kishan | 25 | FruitDelight | 2020-09-12 | 170.00 |

| Madhavi | 23 | Samsung | 2020-07-19 | 4590.00 |

| Subbu | 24 | Black-Current | 2020-09-26 | 470.00 |

| Nikhita | 23 | SundayBlock | 2020-07-21 | 1290.00 |

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

6 rows in set (0.00 sec)

mysql> select \

-> customer.name as DataSet, \

-> product.pname as ProductList \

-> from customer \

-> LEFT JOIN product ON customer.fav = product.pid;

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

| DataSet | ProductList |

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

| Akash | NULL |

| Bharath | Black-Current |

| Harish | Amul-Choco |

| Kishan | FruitDelight |

| Madhavi | Samsung |

| Praveen | NULL |

| Subbu | Black-Current |

| Nikhita | SundayBlock |

| Lekhana | NULL |

| Shiva | NULL |

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

10 rows in set (0.00 sec)

mysql> select \

-> customer.name as DataSet, \

-> customer.age as Age, \

-> product.pname as ProductList, \

-> product.pdate as Date, \

-> product.amount as Cost \

-> from customer \

-> LEFT JOIN product ON customer.fav = product.pid

-> ;

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

| DataSet | Age | ProductList | Date | Cost |

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

| Akash | 22 | NULL | NULL | NULL |

| Bharath | 23 | Black-Current | 2020-09-26 | 470.00 |

| Harish | 24 | Amul-Choco | 2020-09-28 | 390.00 |

| Kishan | 25 | FruitDelight | 2020-09-12 | 170.00 |

| Madhavi | 23 | Samsung | 2020-07-19 | 4590.00 |

| Praveen | 26 | NULL | NULL | NULL |

| Subbu | 24 | Black-Current | 2020-09-26 | 470.00 |

| Nikhita | 23 | SundayBlock | 2020-07-21 | 1290.00 |

| Lekhana | 24 | NULL | NULL | NULL |

| Shiva | 25 | NULL | NULL | NULL |

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

10 rows in set (0.00 sec)

mysql> select \

-> customer.name as DataSet, \

-> product.pname as ProductList \

-> from customer \

-> RIGHT JOIN product ON customer.fav = product.pid;

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

| DataSet | ProductList |

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

| Harish | Amul-Choco |

| Bharath | Black-Current |

| Subbu | Black-Current |

| NULL | Alexa |

| Nikhita | SundayBlock |

| Kishan | FruitDelight |

| NULL | Iphone |

| Madhavi | Samsung |

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

8 rows in set (0.00 sec)

mysql> select \

-> customer.name as DataSet, \

-> customer.age as Age, \

-> product.pname as ProductList, \

-> product.pdate as Date, \

-> product.amount as Cost \

-> from customer \

-> RIGHT JOIN product ON customer.fav = product.pid;

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

| DataSet | Age | ProductList | Date | Cost |

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

| Harish | 24 | Amul-Choco | 2020-09-28 | 390.00 |

| Bharath | 23 | Black-Current | 2020-09-26 | 470.00 |

| Subbu | 24 | Black-Current | 2020-09-26 | 470.00 |

| NULL | NULL | Alexa | 2020-08-15 | 790.00 |

| Nikhita | 23 | SundayBlock | 2020-07-21 | 1290.00 |

| Kishan | 25 | FruitDelight | 2020-09-12 | 170.00 |

| NULL | NULL | Iphone | 2020-09-24 | 75000.00 |

| Madhavi | 23 | Samsung | 2020-07-19 | 4590.00 |

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

8 rows in set (0.00 sec)

mysql> select \

-> customer.name as DataSet, \

-> customer.age as Age, \

-> customer.address as Address, \

-> product.pname as ProductList, \

-> product.pdate as Date, \

-> product.amount as Cost \

-> from customer \

-> CROSS JOIN product;

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

| DataSet | Age | Address | ProductList | Date | Cost |

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

| Akash | 22 | Kphb-5,Road-3,Block32 | Amul-Choco | 2020-09-28 | 390.00 |

| Akash | 22 | Kphb-5,Road-3,Block32 | Black-Current | 2020-09-26 | 470.00 |

| Akash | 22 | Kphb-5,Road-3,Block32 | Alexa | 2020-08-15 | 790.00 |

| Akash | 22 | Kphb-5,Road-3,Block32 | SundayBlock | 2020-07-21 | 1290.00 |

| Akash | 22 | Kphb-5,Road-3,Block32 | FruitDelight | 2020-09-12 | 170.00 |

| Akash | 22 | Kphb-5,Road-3,Block32 | Iphone | 2020-09-24 | 75000.00 |

| Akash | 22 | Kphb-5,Road-3,Block32 | Samsung | 2020-07-19 | 4590.00 |

| Bharath | 23 | Kphb-6,Road-2,Block22 | Amul-Choco | 2020-09-28 | 390.00 |

| Bharath | 23 | Kphb-6,Road-2,Block22 | Black-Current | 2020-09-26 | 470.00 |

| Bharath | 23 | Kphb-6,Road-2,Block22 | Alexa | 2020-08-15 | 790.00 |

| Bharath | 23 | Kphb-6,Road-2,Block22 | SundayBlock | 2020-07-21 | 1290.00 |

| Bharath | 23 | Kphb-6,Road-2,Block22 | FruitDelight | 2020-09-12 | 170.00 |

| Bharath | 23 | Kphb-6,Road-2,Block22 | Iphone | 2020-09-24 | 75000.00 |

| Bharath | 23 | Kphb-6,Road-2,Block22 | Samsung | 2020-07-19 | 4590.00 |

| Harish | 24 | Kphb-2,Road-1,Block12 | Amul-Choco | 2020-09-28 | 390.00 |

| Harish | 24 | Kphb-2,Road-1,Block12 | Black-Current | 2020-09-26 | 470.00 |

| Harish | 24 | Kphb-2,Road-1,Block12 | Alexa | 2020-08-15 | 790.00 |

| Harish | 24 | Kphb-2,Road-1,Block12 | SundayBlock | 2020-07-21 | 1290.00 |

| Harish | 24 | Kphb-2,Road-1,Block12 | FruitDelight | 2020-09-12 | 170.00 |

| Harish | 24 | Kphb-2,Road-1,Block12 | Iphone | 2020-09-24 | 75000.00 |

| Harish | 24 | Kphb-2,Road-1,Block12 | Samsung | 2020-07-19 | 4590.00 |

| Kishan | 25 | Kphb-1,Road-3,Block15 | Amul-Choco | 2020-09-28 | 390.00 |

| Kishan | 25 | Kphb-1,Road-3,Block15 | Black-Current | 2020-09-26 | 470.00 |

| Kishan | 25 | Kphb-1,Road-3,Block15 | Alexa | 2020-08-15 | 790.00 |

| Kishan | 25 | Kphb-1,Road-3,Block15 | SundayBlock | 2020-07-21 | 1290.00 |

| Kishan | 25 | Kphb-1,Road-3,Block15 | FruitDelight | 2020-09-12 | 170.00 |

| Kishan | 25 | Kphb-1,Road-3,Block15 | Iphone | 2020-09-24 | 75000.00 |

| Kishan | 25 | Kphb-1,Road-3,Block15 | Samsung | 2020-07-19 | 4590.00 |

| Madhavi | 23 | Kphb-3,Road-6,Block17 | Amul-Choco | 2020-09-28 | 390.00 |

| Madhavi | 23 | Kphb-3,Road-6,Block17 | Black-Current | 2020-09-26 | 470.00 |

| Madhavi | 23 | Kphb-3,Road-6,Block17 | Alexa | 2020-08-15 | 790.00 |

| Madhavi | 23 | Kphb-3,Road-6,Block17 | SundayBlock | 2020-07-21 | 1290.00 |

| Madhavi | 23 | Kphb-3,Road-6,Block17 | FruitDelight | 2020-09-12 | 170.00 |

| Madhavi | 23 | Kphb-3,Road-6,Block17 | Iphone | 2020-09-24 | 75000.00 |

| Madhavi | 23 | Kphb-3,Road-6,Block17 | Samsung | 2020-07-19 | 4590.00 |

| Praveen | 26 | Kphb-7,Road-5,Block35 | Amul-Choco | 2020-09-28 | 390.00 |

| Praveen | 26 | Kphb-7,Road-5,Block35 | Black-Current | 2020-09-26 | 470.00 |

| Praveen | 26 | Kphb-7,Road-5,Block35 | Alexa | 2020-08-15 | 790.00 |

| Praveen | 26 | Kphb-7,Road-5,Block35 | SundayBlock | 2020-07-21 | 1290.00 |

| Praveen | 26 | Kphb-7,Road-5,Block35 | FruitDelight | 2020-09-12 | 170.00 |

| Praveen | 26 | Kphb-7,Road-5,Block35 | Iphone | 2020-09-24 | 75000.00 |

| Praveen | 26 | Kphb-7,Road-5,Block35 | Samsung | 2020-07-19 | 4590.00 |

| Subbu | 24 | Kphb-8,Road-4,Block37 | Amul-Choco | 2020-09-28 | 390.00 |

| Subbu | 24 | Kphb-8,Road-4,Block37 | Black-Current | 2020-09-26 | 470.00 |

| Subbu | 24 | Kphb-8,Road-4,Block37 | Alexa | 2020-08-15 | 790.00 |

| Subbu | 24 | Kphb-8,Road-4,Block37 | SundayBlock | 2020-07-21 | 1290.00 |

| Subbu | 24 | Kphb-8,Road-4,Block37 | FruitDelight | 2020-09-12 | 170.00 |

| Subbu | 24 | Kphb-8,Road-4,Block37 | Iphone | 2020-09-24 | 75000.00 |

| Subbu | 24 | Kphb-8,Road-4,Block37 | Samsung | 2020-07-19 | 4590.00 |

| Nikhita | 23 | Kphb-9,Road-7,Block27 | Amul-Choco | 2020-09-28 | 390.00 |

| Nikhita | 23 | Kphb-9,Road-7,Block27 | Black-Current | 2020-09-26 | 470.00 |

| Nikhita | 23 | Kphb-9,Road-7,Block27 | Alexa | 2020-08-15 | 790.00 |

| Nikhita | 23 | Kphb-9,Road-7,Block27 | SundayBlock | 2020-07-21 | 1290.00 |

| Nikhita | 23 | Kphb-9,Road-7,Block27 | FruitDelight | 2020-09-12 | 170.00 |

| Nikhita | 23 | Kphb-9,Road-7,Block27 | Iphone | 2020-09-24 | 75000.00 |

| Nikhita | 23 | Kphb-9,Road-7,Block27 | Samsung | 2020-07-19 | 4590.00 |

| Lekhana | 24 | Kphb-7,Road-3,Block34 | Amul-Choco | 2020-09-28 | 390.00 |

| Lekhana | 24 | Kphb-7,Road-3,Block34 | Black-Current | 2020-09-26 | 470.00 |

| Lekhana | 24 | Kphb-7,Road-3,Block34 | Alexa | 2020-08-15 | 790.00 |

| Lekhana | 24 | Kphb-7,Road-3,Block34 | SundayBlock | 2020-07-21 | 1290.00 |

| Lekhana | 24 | Kphb-7,Road-3,Block34 | FruitDelight | 2020-09-12 | 170.00 |

| Lekhana | 24 | Kphb-7,Road-3,Block34 | Iphone | 2020-09-24 | 75000.00 |

| Lekhana | 24 | Kphb-7,Road-3,Block34 | Samsung | 2020-07-19 | 4590.00 |

| Shiva | 25 | Kphb-3,Road-7,Block44 | Amul-Choco | 2020-09-28 | 390.00 |

| Shiva | 25 | Kphb-3,Road-7,Block44 | Black-Current | 2020-09-26 | 470.00 |

| Shiva | 25 | Kphb-3,Road-7,Block44 | Alexa | 2020-08-15 | 790.00 |

| Shiva | 25 | Kphb-3,Road-7,Block44 | SundayBlock | 2020-07-21 | 1290.00 |

| Shiva | 25 | Kphb-3,Road-7,Block44 | FruitDelight | 2020-09-12 | 170.00 |

| Shiva | 25 | Kphb-3,Road-7,Block44 | Iphone | 2020-09-24 | 75000.00 |

| Shiva | 25 | Kphb-3,Road-7,Block44 | Samsung | 2020-07-19 | 4590.00 |

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

70 rows in set (0.00 sec)

mysql> select \

-> customer.name as DataSet, \

-> product.pname as ProductList \

-> from customer \

-> LEFT JOIN product ON customer.fav = product.pid

->

-> UNION ALL

->

-> select \

-> customer.name as DataSet, \

-> product.pname as ProductList \

-> from customer \

-> RIGHT JOIN product ON customer.fav = product.pid;

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

| DataSet | ProductList |

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

| Akash | NULL |

| Bharath | Black-Current |

| Harish | Amul-Choco |

| Kishan | FruitDelight |

| Madhavi | Samsung |

| Praveen | NULL |

| Subbu | Black-Current |

| Nikhita | SundayBlock |

| Lekhana | NULL |

| Shiva | NULL |

| Harish | Amul-Choco |

| Bharath | Black-Current |

| Subbu | Black-Current |

| NULL | Alexa |

| Nikhita | SundayBlock |

| Kishan | FruitDelight |

| NULL | Iphone |

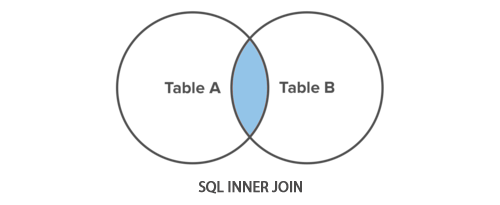
| Madhavi | Samsung |

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

18 rows in set (0.00 sec)

### **INNER JOIN Syntax**

SELECT column\_name(s)  
FROM table1  
INNER JOIN table2ON table1.column\_name = table2.column\_name;



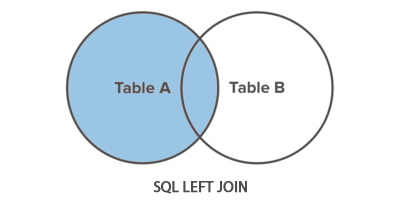
SELECT Orders.OrderID, Customers.CustomerName  
FROM Orders  
INNER JOIN Customers ON Orders.CustomerID = Customers.CustomerID;

SELECT t1.emp\_id, t1.emp\_name, t1.hire\_date, t2.dept\_name FROM employees AS t1 INNER JOIN departments AS t2 ON t1.dept\_id = t2.dept\_id ORDER BY emp\_id;

### **LEFT JOIN Syntax**

The LEFT JOIN keyword returns all records from the left table (table1), and the matched records from the right table (table2). The result is NULL from the right side, if there is no match.

SELECT column\_name(s)  
FROM table1  
LEFT JOIN table2ON table1.column\_name = table2.column\_name;

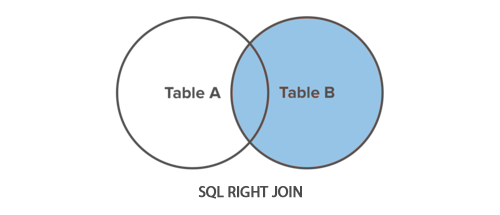


SELECT t1.emp\_id, t1.emp\_name, t1.hire\_date, t2.dept\_name FROM employees AS t1 LEFT JOIN departments AS t2 ON t1.dept\_id = t2.dept\_id ORDER BY emp\_id;

### **RIGHT JOIN Syntax**

The RIGHT JOIN keyword returns all records from the right table (table2), and the matched records from the left table (table1). The result is NULL from the left side, when there is no match.

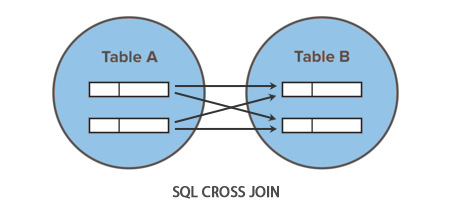
SELECT column\_name(s)  
FROM table1  
RIGHT JOIN table2ON table1.column\_name = table2.column\_name;



SELECT t1.emp\_id, t1.emp\_name, t1.hire\_date, t2.dept\_name FROM employees AS t1 RIGHT JOIN departments AS t2 ON t1.dept\_id = t2.dept\_id ORDER BY dept\_name;

## Using Cross Joins

If you don't specify a join condition when joining two tables, database system combines each row from the first table with each row from the second table. This type of join is called a cross join or a Cartesian product. The following Venn diagram illustrates how cross join works.



SELECT t1.emp\_id, t1.emp\_name, t1.hire\_date, t2.dept\_name FROM employees AS t1 CROSS JOIN departments AS t2;

## **The SQL UNION Operator**

The UNION operator is used to combine the result-set of two or more SELECT statements.

* Each SELECT statement within UNION must have the same number of columns
* The columns must also have similar data types
* The columns in each SELECT statement must also be in the same order

### **UNION Syntax**

SELECT column\_name(s) FROM table1  
UNION  
SELECT column\_name(s) FROM table2;

### **UNION ALL Syntax**

The UNION operator selects only distinct values by default. To allow duplicate values, use UNION ALL:

SELECT column\_name(s) FROM table1  
UNION ALL  
SELECT column\_name(s) FROM table2;

## **UNION**

SQL statement returns the cities (only distinct values) from both the "Customers" and the "Suppliers" table:

SELECT City FROM Customers  
UNION  
SELECT City FROM Suppliers  
ORDER BY City;

## **UNION ALL**

SQL statement returns the cities (duplicate values also) from both the "Customers" and the "Suppliers" table:

SELECT City FROM Customers  
UNION ALL  
SELECT City FROM Suppliers  
ORDER BY City;

## **UNION With WHERE**

SQL statement returns the German cities (only distinct values) from both the "Customers" and the "Suppliers" table:

SELECT City, Country FROM Customers  
WHERE Country='Germany'  
UNION  
SELECT City, Country FROM Suppliers  
WHERE Country='Germany'  
ORDER BY City;

## **UNION ALL With WHERE**

SQL statement returns the German cities (duplicate values also) from both the "Customers" and the "Suppliers" table:

SELECT City, Country FROM Customers  
WHERE Country='Germany'  
UNION ALL  
SELECT City, Country FROM Suppliers  
WHERE Country='Germany'  
ORDER BY City;

## **UNION**

SQL statement lists all customers and suppliers:

SELECT 'Customer' As Type, ContactName, City, Country  
FROM Customers  
UNION  
SELECT 'Supplier', ContactName, City, Country  
FROM Suppliers;

## **The SQL GROUP BY Statement**

The GROUP BY statement groups rows that have the same values into summary rows, like "find the number of customers in each country".

The GROUP BY statement is often used with aggregate functions (COUNT, MAX, MIN, SUM, AVG) to group the result-set by one or more columns.

### **GROUP BY Syntax**

SELECT column\_name(s)  
FROM table\_name  
WHERE condition  
GROUP BY column\_name(s)ORDER BY column\_name(s);

## **GROUP BY**

The following SQL statement lists the number of customers in each country:

SELECT COUNT(CustomerID), Country  
FROM Customers  
GROUP BY Country;

SQL statement lists the number of customers in each country, sorted high to low:

SELECT COUNT(CustomerID), Country  
FROM Customers  
GROUP BY Country  
ORDER BY COUNT(CustomerID) DESC;

## **GROUP BY With JOIN**

SQL statement lists the number of orders sent by each shipper:

SELECT Shippers.ShipperName, COUNT(Orders.OrderID) AS NumberOfOrders FROM Orders  
LEFT JOIN Shippers ON Orders.ShipperID = Shippers.ShipperID  
GROUP BY ShipperName;

## **SQL PRIMARY KEY Constraint**

The PRIMARY KEY constraint uniquely identifies each record in a table.

Primary keys must contain UNIQUE values and cannot contain NULL values.

A table can have only ONE primary key; and in the table, this primary key can consist of single or multiple columns (fields).

SQL creates a PRIMARY KEY on the "ID" column when the "Persons" table is created:

CREATE TABLE Persons (  
    ID int NOT NULL,  
    LastName varchar(255) NOT NULL,  
    FirstName varchar(255),  
    Age int,  
    PRIMARY KEY (ID)  
);

## **SQL FOREIGN KEY Constraint**

A FOREIGN KEY is a key used to link two tables together.

A FOREIGN KEY is a field (or collection of fields) in one table that refers to the PRIMARY KEY in another table.

The table containing the foreign key is called the child table, and the table containing the candidate key is called the referenced or parent table

CREATE TABLE Orders (  
    OrderID int NOT NULL,  
    OrderNumber int NOT NULL,  
    PersonID int,  
    PRIMARY KEY (OrderID),  
    FOREIGN KEY (PersonID) REFERENCES Persons(PersonID)  
);

## **SQL Date Data Types**

**MySQL** comes with the following data types for storing a date or a date/time value in the database:

* DATE - format YYYY-MM-DD
* DATETIME - format: YYYY-MM-DD HH:MI:SS
* TIMESTAMP - format: YYYY-MM-DD HH:MI:SS
* YEAR - format YYYY or YY

SELECT \* FROM Orders WHERE OrderDate='2008-11-11'

SELECT \* FROM Orders WHERE OrderDate='2008-11-11 13:23:44'