

SQL Queries - Operations with Sets

The SQL offers three operations with sets which can also be found in relational algebra. Considering two simple relations (R1 and R2) these operations are:

- ❑ Union - the relation containing all tuples that appear in R1, R2, or both;
- ❑ Intersect - is the relation containing all tuples that appear in both R1 and R2;
- ❑ Difference - the relation containing all tuples of R1 that do not appear in R2.

1-The **UNION** operator is used to combine the result-set of two or more SELECT statements. The SELECT statement within the UNION must have the same number of columns and have similar or compatible data types.

EX1:- Display pro_name, pro_avai from product table where pro_id more than 3 or pro_id>1 using Union operator?

Sol: Select pro_name,pro_avai From Product Where pro_id > 3 union Select pro_name,pro_avai From Product Where pro_id >1;

pro_name	pro_avai
CAKES	3
coffy	1
ink	
MEAT	6
milk	78
tea	1
WATER	15

EX2:- Display cust_id, cust_name and cust address where cust_age less 34 or more than 56 using Union operator?

Sol:- Select cust_id,cust_name,cust_address From Customer Where cust_age < 34 union Select cust_id,cust_name,cust_address From Customer Where cust_age >56;

cust_id	cust_name	cust_address
2	sad	diyala
4	rad	basra
6	rasha	babel
8	salam	

2-The **SQL INTERSECT** operator is used to return the results of 2 or more SELECT statements. However, it only returns the rows selected by all queries or data sets. If a record exists in one query and not in the other, it will be omitted from the INTERSECT results. An example of such situation is given below. The script below only works in SQL Server and Oracle databases.

An example of this approach is given in the next slide.

EX1:- Select cust_name From Customer Where cust_id>3 INTERSECT Select cust_name From Customer Where cust_id > 1;

The INTERSECT operator isn't supported in MySQL. To make a similar function in MySQL we can use the "IN", "EXISTS" or arithmetic operators. In our previous example we can reach the same functionality by using simple arithmetic operators. An example of this approach is given below.

EX1:- Display cust_namefrom customer table where cust_id>3 and cust_id > 1;

Select cust_name From Customer Where cust_id>3 and cust_id > 1;

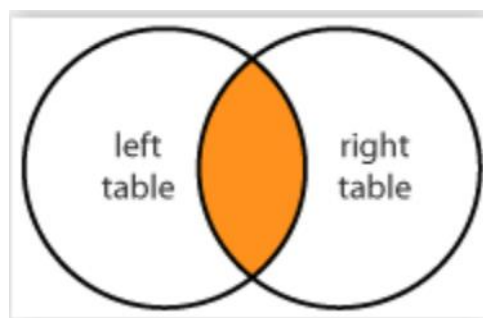
cust_name
Moler
suha
rasha
Moler
Morad
fahd

16- SQL Queries - Joins

SQL joins are used to combine rows from two or more tables. There are in SQL four types of joins:

- Inner join and natural joins - select records that have matching values in both tables;
- Left Outer Join - select records from the first (left-most) table with matching right table records;
- Right Outer Join - select record from the second (right-most) table with matching left table records;
- Full Outer Join - selects all records that match either left or right table records.

1- **Inner Join** and Natural Join The INNER JOIN keyword selects all rows from both tables as long as there is a match between the columns in both tables. Graphically the inner join is depicted in Figure below.



An example using INNER JOIN syntax is given below.

EX1:- SELECT m1.id,m1.name,m2.product from market1 m1 INNER JOIN market2 m2 ON m1.id=m2.id;

id	name	product
1	ali	meat
2	samer	water
3	adeel	milk
3	adeel	joice
4	basil	tea
5	ramze	coffy

EX2:- SELECT m1.id,m1.name,m2.product from market1 m1 INNER JOIN market2 m2 ON m1.id=m2.id WHERE m2.product<>'meat';

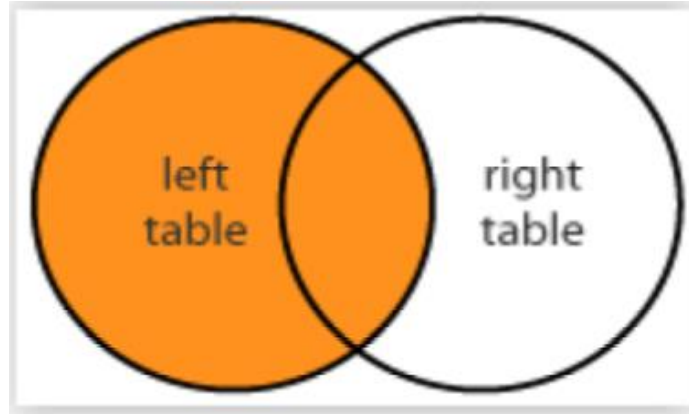
id	name	product
2	samer	water
3	adeel	milk
3	adeel	joice
4	basil	tea
5	ramze	coffy

EX3:- SELECT m1.id,m1.name,m2.product from market1 m1 INNER JOIN market2 m2 ON m1.id=m2.id WHERE m2.product<>'meat' and m1.name<>'basil';

id	name	product
2	samer	water
3	adeel	milk
3	adeel	joice
5	ramze	coffy

2- **Left Outer Join** The LEFT JOIN keyword returns all rows from the left table (table1), with the matching rows in the right table (table2). The result

is NULL in the right side when there is no match. Graphically the inner join is depicted in Figure below.



An examples using LEFT OUTER JOIN syntax is given in the below.

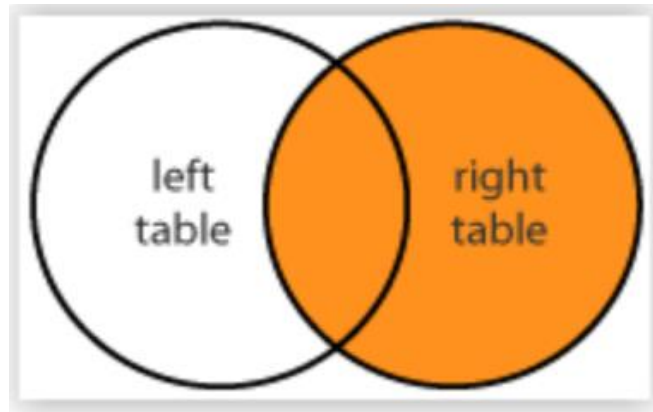
EX1: SELECT market1.id,market1.name,market2.product from market1 LEFT JOIN market2 ON market1.id=market2.id;

id	name	product
1	ali	meat
2	samer	water
3	adeel	joice
3	adeel	milk
4	basil	tea
5	ramze	coffy
6	sanderla	tomoto
7	fadi	orang
*		

EX2: SELECT market1.id,market1.name,market2.product from market1 LEFT JOIN market2 ON market1.id=market2.id ORDER BY market1.name;

id	name	product
3	adeel	milk
3	adeel	joice
1	ali	meat
4	basil	tea
7	fadi	orang
5	ramze	coffy
2	samer	water
6	sanderla	tomoto
*		

3- **Right Outer Join** The RIGHT JOIN keyword returns all rows from the right table (table2), with the matching rows in the left table (table1). The result is NULL in the left side when there is no match. Graphically the inner join is depicted in Figure below.



An examples using LEFT OUTER JOIN syntax is given in the next slides.

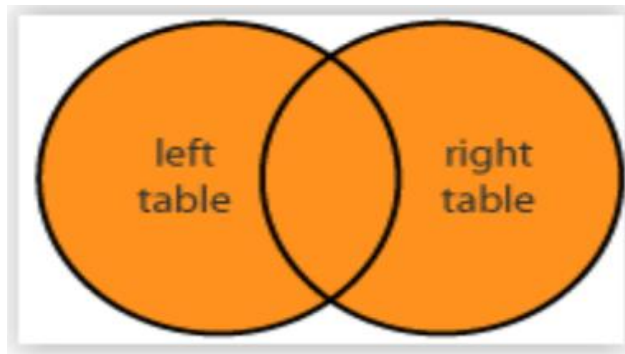
EX1: SELECT market1.id,market1.name,market2.product from market1 RIGHT JOIN market2 ON market1.id=market2.id;

id	name	product
1	ali	meat
2	samer	water
3	adeel	milk
3	adeel	joice
4	basil	tea
5	ramze	coffy
6	sanderla	tomoto
7	fadi	orang
*		

EX2: SELECT m1.id,m1.name, m2.product from market1 m1 RIGHT JOIN market2 m2 ON m1.id=m2.id where m1.name<>'sanderla' order by m1.name;

id	name	product
3	adeel	joice
3	adeel	milk
1	ali	meat
4	basil	tea
7	fadi	orang
5	ramze	coffy
2	samer	water
*		

4- **Full Outer Join** The FULL OUTER JOIN keyword returns all rows from the left table (table1) and from the right table (table2). It combines the results from LEFT JOINS and RIGHT JOINS. Graphically the inner join is depicted in Figure below.



An examples using LEFT OUTER JOIN syntax is given in the below.

EX1: SELECT m1.id,m1.name, m2.product from market1 m1 FULL JOIN market2 m2 ON m1.id=m2.id;

id	name	product
1	ali	meat
2	samer	water
3	adeel	milk
3	adeel	joice
4	basil	tea
5	ramze	coffy
6	sanderla	tomoto
7	fadi	orang
8	mary	borgar
*		

EX2: SELECT m1.id,m1.name, m2.product from market1 m1 FULL JOIN market2 m2 ON m1.id=m2.id where m1.name<>'sanderla' order by m1.name;

id	name	product
3	adeel	joice
3	adeel	milk
1	ali	meat
4	basil	tea
7	fadi	orang
8	mary	borgar
5	ramze	coffy
2	samer	water
*		