LAB 5

Title: Join and Set Operations in SQL

Objective:

- To be familiar with concept of Join (INNER,OUTER,NATURAL JOIN) in SQL and its implementation
- To be familiar with Set Operations in SQL and its implementation

Theory:

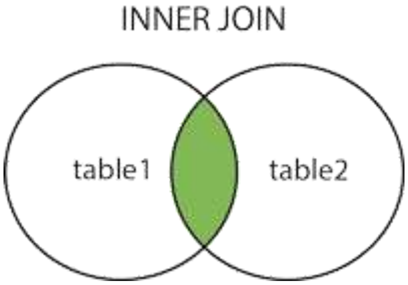
JOIN

- In SQL, a join is an operation that combines rows from two or more tables based on a related column between them.
- It allows you to retrieve data from multiple tables simultaneously by establishing a relationship between them.

There are different types of joins that can be used:

Inner Join

- Returns only the rows that have matching values in both tables. It combines rows from the tables based on the specified join condition.
- If we omit the INNER keyword with the JOIN query, we will get the same output.



Syntax:

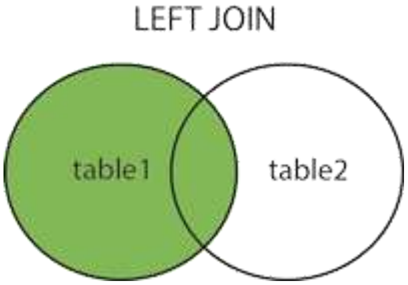
```
SELECT column_name(s)
FROM table1 INNER JOIN table2
ON
table1.column_name = table2.column_name;
```

Outer JOIN

- Unlike an inner join, which only returns matching rows, an outer join ensures that all rows from one table (or both tables) are included in the result set, even if there is no corresponding match in the other table.

There are three types of outer joins:

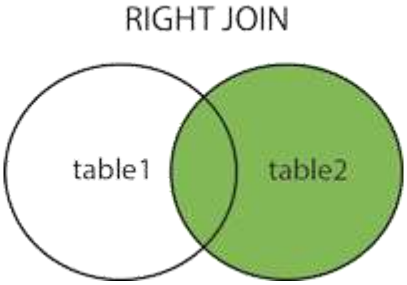
1) LEFT JOIN (LEFT OUTER JOIN): Returns all rows from the left table and the matching rows from the right table. If there are no matching rows in the right table, NULL values are returned for the columns of the right table.



Syntax:

```
SELECT column_name(s)
FROM table1 LEFT JOIN table2
ON
table1.column_name = table2.column_name;
```

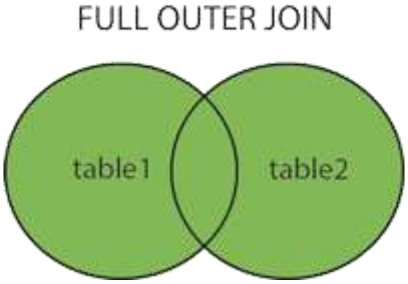
2) RIGHT JOIN (RIGHT OUTER JOIN): Returns all rows from the right table and the matching rows from the left table. If there are no matching rows in the left table, NULL values are returned for the columns of the left table.



Syntax:

```
SELECT column_name(s)
FROM table1 RIGHT JOIN table2
ON
table1.column_name = table2.column_name;
```

3)FULL JOIN (FULL OUTER JOIN): Returns all rows from both tables, regardless of whether they have a match or not. If there is no match, NULL values are returned for the columns of the table that does not have a match.



Syntax:

```
SELECT column_name(s)
FROM table1 FULL JOIN table2
ON
table1.column_name = table2.column_name;
```

NATURAL JOIN

- The NATURAL JOIN is a type of join in SQL that automatically matches columns with the same name in the joined tables.
- It eliminates the need to specify the join condition explicitly.
- The resulting join will include only one instance of columns with the same name. It automatically eliminates duplicate columns from the join result.

Syntax:

```
SELECT column(s) name
FROM table1 NATURAL JOIN table2;
```

It's important to note that the NATURAL JOIN relies on columns having the same name and data types in both tables.

Set operations

- In SQL, set operation is used to combine the two or more SQL SELECT statements.
- There are certain rules which must be followed to perform operations using SET operators in SQL.
    - Rules are as follows:
    - ☞ The number of columns in the SELECT statement on which you want to apply the SQL set operators must be the same.
    - ☞ The order of columns must be in the same order.
    - ☞ The selected columns must have the same data type.

UNION

- The SQL Union operation is used to combine the result of two or more SQL SELECT queries.
- The union operation eliminates the duplicate rows from its result set.

Syntax:

```
SELECT column_name(s) FROM table_1
UNION
SELECT column_name(s) FROM table_2;
```

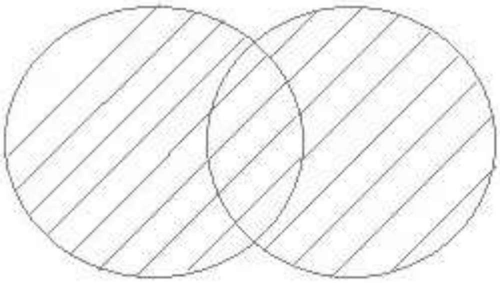


figure: pictorial representation of UNION operation

UNION ALL

- It is similar to Union but it also shows the duplicate rows.

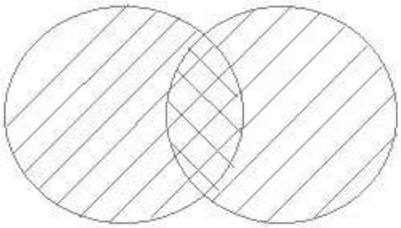


figure: Pictorial representation of UNION ALL operation

INTERSECT

- The Intersect operation returns the common rows from both the SELECT statements.
- It has no duplicates and it arranges the data in ascending order by default.

Syntax:

```
SELECT column_name(s) FROM table_1
INTERSECT
SELECT column_name(s) FROM table_2;
```

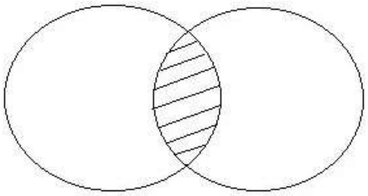


figure: pictorial representation of INTERSECT operation

EXCEPT

- EXCEPT operator is used to display the rows which are present in the first query but absent in the second query.
- It has no duplicates and data arranged in ascending order by default.

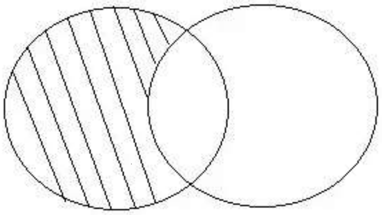


figure: pictorial representation of EXCEPT operation

Syntax:

```
SELECT column_name(s) FROM table_1
EXCEPT
SELECT column_name(s) FROM table_2;
```

Problem 1:

1) Create any database name
2) Create two table name Employee and Department will following columns using appropriate data types and insert the following data in table.

   Your table must be in following form:

Employee

emp_id	emp_name	Position	salary	dept_id
1	Anish	Manger	25000	1
2	Sita	Secretary	25000	2
3	Ronit	Analyst	40000	5
4	Riya	Manager	50000	3

Department

dept_id	dept_name	HOD
1	Sales	Janak
2	Marketing	Madhav
3	Finance	Sapana
4	Operations	Durga

3) Now perform the following Join Operations
    1. Inner Join
    2. Outer Join
        - Left Outer Join
        - Right Outer Join
        - Full Join
    3. Natural Join
    4. Cross Join
4) Write SQL queries to
    - Find Employee names with their department
    - Find emp_name,position,salary of employee who works in finance department
    - Find emp_name of employee who works in sales department
    - Find the information of employee who works in marketing department
    - Find the HOD of Riya

Problem 2:

1) Create two table named **emp_civildepartment** and **emp_computerdepartment** with following columns with appropriate data types and insert the following data in table After insertion your table must look like as follows:

emp_civildepartment

emp_id	emp_name	address
1	Kapil	Chitwan
2	Ujwal	Dharan
3	Pradip	Palpa
4	Prakash	Kathmandu
5	Supriya	Mahendranagar

emp_computerdepartment

emp_id	emp_name	address
1	Mukunda	Surkhet
2	Santosh	Pokhara
3	Pradip	Palpa
4	Jasbin	Kathmandu
5	Supriya	Mahendranagar

2) perform the following set operations

- UNION

- UNION ALL
- INTERSET
- EXCEPT

3) Write SQL queries for the following:
   - Find the name of employee who works either civil or computer department
   - Find the name of employee who works in both civil and computer department
   - Find the name of employee who works in computer department but not in civil department
   - Find the common address of where both computer and civil department employee lives in

.

Discussion: (This portion is left for student)

Conclusion: (This portion is left for student)

*******THE END*******