JOINS:

“The process of retrieval of data from multiple tables simultaneously is known as JOINS”.

Why or When do we use Joins?

Whenever we have to select attributes from more than one table we use Joins.

Types of Joins:

1. Cartesian Join/Cross Join.
2. Inner Join/Equi Join
3. Outer Join
   - ✓Left Outer Join
   - ✓Right Outer Join
   - ✓Full Outer Join
4. Self Join
5. Natural Join

1. Cartesian Join/Cross Join:

In Cartesian Join, a record from Table 1 will be merged with all the records of Table 2 and so on.

- The Number of Columns in the result table will be equivalent to the summations of columns present in both tables. Number of Col T1 + Number of Col T2 (4+3=7 Columns).
- The Number of Rows in the result table will be equivalent to the product of the number of rows present in both tables. Number of Rows = Number of rows T1 X Number of Rows T2 (3*3=9 Rows).

Syntax for Cross Join:

```
Select Column_Name
From Table Name1, Table Name2;
```

Examples:

1. WAQTD Employee name and Department name of all the employee.

```
Select EmpName, DeptName
From employee, department;
```

2. WAQTD Employee name, Designation and Department name of all the employees.

```
Select EmpName, Designation, DeptName
From employee, department;
```

Note: Cartesian join will result in both valid and invalid records, when compared to valid records, invalid records are more. Hence it is not a preferred type of Join.

2. **Inner Join/Equi Join:**

   Inner Join is used to obtain only matching records or the records which have a pair.

   To obtain matching records we must use the **Join Condition.**

Join Condition: It is a condition on which we merge the two tables.

Note: To Join ‘n’ number of tables we must write ‘n-1’ number of join conditions.

The syntax for Join condition: `Table_Name1.Column_Name=Table_Name2.Column_Name;`

Syntax for Inner Join:

```
Select Column_Name
From Table_Name1, Table_Name2
Where <Join_Condition>;
```

Example:

1. WAQTD ename and Location for all the employees working as Manager.

```
Select EmpName, Location
From employee, department
Where employee.DeptNo=department.DeptNo and Designation='Manager';
```

2. WAQTD ename deptno, dname and location of the employee earning more than 2000 in New York.

```
Select EmpName,employee.DeptNo,DeptName,Location
From employee, department
Where employee.DeptNo = department.DeptNo and Salary>2000 and Location = 'New York';
```

3. **Outer Join:**

   Outer join is used to obtain unmatched records.

   1. Left Outer Join
   2. Right Outer Join
   3. Full Outer Join

1. Left Outer Join:

It is used to obtain unmatched records of left table along with matching records.

Syntax:

```
Select */Column_name
From Table_Name1 Left Join Table_Name2
On Table_Name1.Column_name = Table_Name2.column_name;
```

2. Right Outer Join:

It is used to obtain unmatched records of right table along with matching records.

Syntax:

```
Select */Column_name
From Table_Name1 Right Join Table_Name2
On Table_Name1.Column_name = Table_Name2.column_name;
```

3. Full Outer Join:

It is used to obtain unmatched records of both left and right tables along with matching records.

Syntax:

```
Select */Column_name
From Table_Name1 Full Outer Join Table_Name2
On Table_Name1.Column_name = Table_Name2.column_name;
```

4. Self Join:

Joining the table by itself is known as Self Join.

“Whenever the data to be selected is in the same table but present in different records we use Self-join”, Self Join is achieved by Joining the same table by utilizing different columns.

Syntax:

```
Select */Column_name
From Table_Name1, Table_Name2
Where <Joining Condition>;
```

Joining Condition: E1.MGR=E2.EmpNo

Examples:

1. WAQTD Ename and Manager’s name for all the employees.

```
Select E1.EmpName , E2.EmpName
From employee E1 , employee E2
Where E1.MGR = E2.EmpNo;
```

2. WAQTD Ename, salary along with manager’s name and manager’s salary for all the employees.

```
Select E1.EmpName , E1.Salary , E2.EmpName , E2.Salary
From employee E1 , employee E2
Where E1.MGR = E2.EmpNo;
```

5. Natural Join:

"It behaves as Inner join if there is a relation between the given two tables, else it behaves as Cross join".

Syntax:

```
Select */Column_name
From Table_Name1 Natural Join Table_Name2;
```

Example:

1. WAQTD name of the employee and his manager's name if employee is working as Clerk.

```
Select E1.EmpName,E2.EmpName
From employee E1 , employee E2
Where E1.MGR = E2.EmpNo and E1.designation = 'Clerk';
```

2. WAQTD name of the employee and manager's designation if manager works in department 40 or 60.

```
Select E1.EmpName,E2.Designation
From employee E1 , employee E2
Where E1.MGR = E2.EmpNo and E2.DeptNo in (40,60);
```