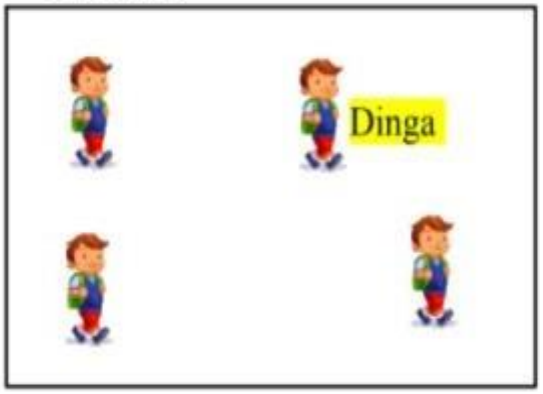
JOINS

The process of retrieval of data from multiple tables simultaneouslyis known as JOINS ".

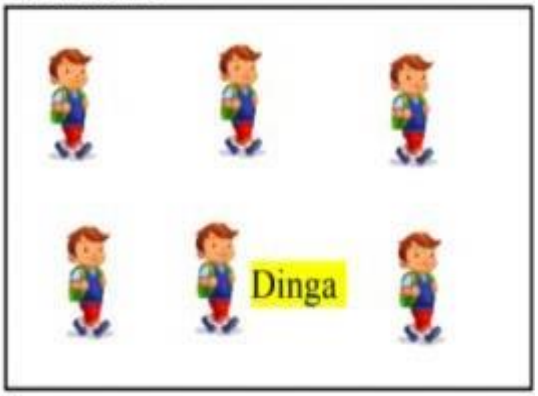
WHY ? WHEN ?

Whenever the attributes is to be selected from both the tables we use Joins

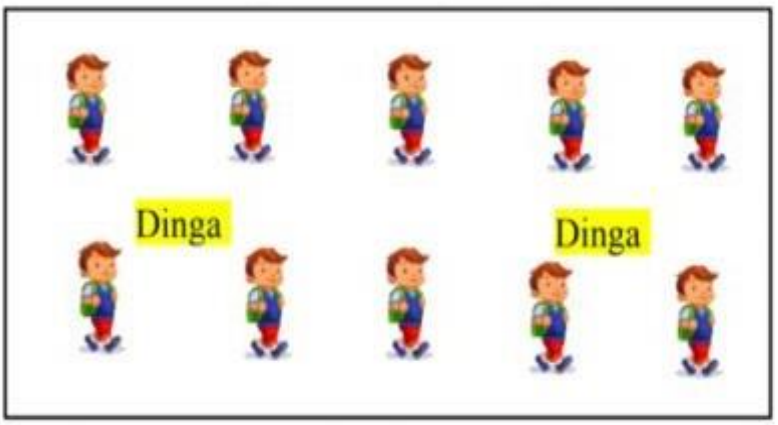
CLASS A



CLASS B



COMBINED CLASS



Types of JOINS .

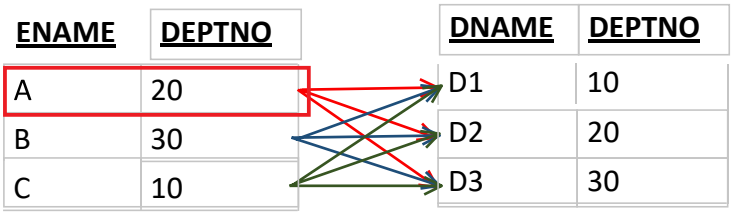
We have 5 types of joins

1. CARTESIAN JOIN / CROSS JOIN
2. INNER JOIN / EQUI JOIN
3. OUTER JOIN
    i. LEFT OUTER JOIN
    ii. RIGHT OUTER JOIN
    iii. 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 withAll the records of table 2 .

EMP

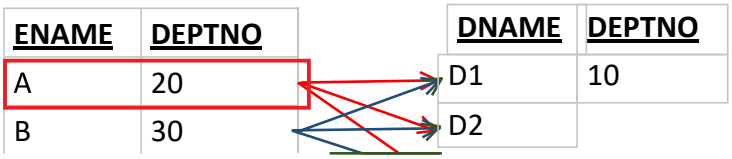


ENAME	DEPTNO
A	20
B	30
C	10

DNAME	DEPTNO
D1	10
D2	20
D3	30

- **Number of Columns in the Result table :** will be equivalent to the summations of columns present in both the tables .

Number of Col = Number of Col T1 + Number of Col T2
2 + 2
= 4 Columns



ENAME	DEPTNO
A	20
B	30

DNAME	DEPTNO
D1	10
D2	

- **Number of Rows in the Result table :** will be equivalent to the product of number of rows present in the both the tables .

Number of Rows = Number of Rows T1 x Number of Rows T2
3 x 3
= 9 Rows .

Result Table :

ENAME	DEPTNO	DNAME	DEPTNO
A	20	D1	10
A	20	D2	20
A	20	D3	30
B	30	D1	10
B	30	D2	20
B	30	D3	30
C	10	D1	10
C	10	D2	20
C	10	D3	30

SYNTAX:

1. **ANSI** [American National Standard Institute]

```
SELECT Column_Name
FROM Table_Name1 CROSS JOIN Table_Name2 ;
```

2. **Oracle**

```
SELECT Column_Name
FROM Table_Name1 , Table_Name2 ;
```

Example :

1. WAQTD ename and dept name for all the employees .

```
SELECT ENAME , DNAME
FROM EMP , DEPT ;

SELECT ENAME , DNAME
FROM EMP CROSS JOIN DEPT ;
```

2.INNER JOIN :

"It is used to Obtain only Matching Records "Or " A records which has a Pair " .

SYNTAX:

1 **ANSI** [American National Standard Institute]

```
SELECT Column_Name
FROM Table_Name1 INNER JOIN Table_Name2
ON < JOIN_CONDITION> ;
```

2. **Oracle**

```
SELECT Column_Name
FROM Table_Name1 , Table_Name2
WHERE <JOIN_CONDITION > ;
```

JOIN Condition : It is a condition on which the two tables are merged .

Syntax: Table_Name1.Col_Name = Table_Name2.Col_Name

Join Condition :EMP.DEPTNO = DEPT.DEPTNO

EXAMPLE: WAQTD TO DISPLAY DEPT NAMES OF ALL EMPLOYEES.

```
SELECT DNAME
FROM EMP , DEPT
WHERE EMP.DEPTNO = DEPT.DEPTNO;
```

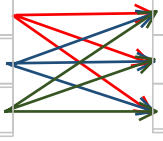
Matching of deptno of EMP table with deptno of DEPT table:

EMP

ENAME	DEPTNO
A	20
B	30
C	10

DEPT

DNAME	DEPTNO
D1	10
D2	20
D3	30



20 = 10	False
20 = 20	True
20 = 30	False

30 = 10	False
30 = 20	False
30 = 30	True

10 = 10	True
10 = 20	False
10 = 30	False

Result Table :

ENAME	EMP.DEPTNO	DNAME	DEPT.DEPTNO
A	20	D2	20
B	30	D3	30
C	10	D1	10

1. WAQTD ename and dept name for all the employees .

   ```
   SELECT ENAME , DNAME
   FROM EMP , DEPT
   WHERE EMP.DEPTNO = DEPT.DEPTNO ;
   ```

2. WAQTD ename and loc for all the employees working as Manager .

   ```
   SELECT ENAME , LOC
   FROM EMP , DEPT
   WHERE EMP.DEPTNO = DEPT.DEPTNO AND JOB='MANAGER' ;
   ```

3. WAQTD ename , sal and dname of the employee working as Clerk in dept 20 with a salary of more than 1800 .

   ```
   SELECT ENAME , SAL , DNAME
   FROM EMP , DEPT
   WHERE EMP.DEPTNO =DEPT.DEPTNO AND
   EMP.DEPTNO = 20 AND JOB ='CLERK' AND SAL > 1800 ;
   ```

4. WAQTD ename, deptno , dname and loc of the employee earningmore than 2000 in New York .

   ```
   SELECT ENAME , EMP.DEPTNO , DNAMEFROM
   EMP , DEPT
   WHERE EMP.DEPTNO = DEPT.DEPTNO AND SAL > 2000
   AND LOC = 'NEW YORK' ;
   ```

NATURAL JOIN

It behaves as **INNER JOIN** if there is a relation between the given two tables , else it behaves as **CROSS JOIN**

ANSI :

```
SELECT Col_Name
FROM Table_Name1 NATURAL JOIN Table_Name2;
```

Syntax:

ENAME	DEPTNO
A	20
B	30
C	10

DNAME	DEPTNO
D1	10
D2	20
D3	30

Result Table : Both tables has a relation (inner join)

DEPTNO	ENAME	DNAME
20	A	D2
30	B	D3
10	C	D1

EMP

ENAME	DEPTNO
A	20
B	30
C	10

CUSTOMER

CNAME	CID
X	101
Y	102
Z	103

Result Table : Tables has no relation (cross join)

ENAME	DEPTNO	CNAME	CID
A	20	X	101
A	20	Y	102
A	20	Z	103
B	30	X	101
B	30	Y	102
B	30	Z	103
C	10	X	101
C	10	Y	102
C	10	Z	103

QUESTIONS:

- - - - - - -

1.WAQTD NAME OF THE EMPLOYEE AND HIS MANAGER'SNAME IF EMPLOYEE IS WORKING AS CLERK

SELECT E1.ENAME , E2.ENAME
FROM EMP E1 , EMP E2 WHERE
E1.MGR = E2.EMPNO AND E1.JOB
= 'CLERK';

*2.*WAQTD NAME OF THE EMPLOYEE AND MANAGER'S DESIGNATION IF MANAGER WORKS IN DEPT 10 OR 20

SELECT E1.ENAME , E2.JOB
FROM EMP E1 , EMP E2 WHERE
E1.MGR = E2.EMPNOAND
E2.DEPTNO IN (10 , 20);

*3.*WAQTD NAME OF THE EMP AND MANAGERS SALARY IFEMPLOYEE AND MANAGER BOTH EARN MORE THAN 2300

SELECT E1.ENAME , E2.SAL
FROM EMP E1 , EMP E2 WHERE
E1.MGR = E2.EMPNO

AND E1.SAL > 2300 AND E2.SAL>2300 ;

4.WAQTD EMP NAME AND MANAGER'S HIREDATE IF EMPLOYEE WAS HIRED BEFORE1982

SELECT E1.ENAME , E2.HIREDATEFROM
EMP E1 , EMP E2

WHERE E1.MGR = E2.EMPNO AND
E1.HIREDATE < '01-JAN-82' ;

5.WAQTD EMP NAME AND MANAGER'S COMM IF

EMPLOYEE WORKS AS SALESMAN AND MANAGERWORKS
IN DEPT 30

```
SELECT E1.ENAME , E2.COMM
FROM EMP E1 , EMP E2 WHERE
E1.MGR = E2.EMPNO

AND E1.JOB = 'SALESMAN' AND E2.DEPTNO = 30 ; ;
```

6. WAQTD EMP NAME AND MANAGER NAME AND THEIRSALARIES
IF EMPLOYEE EARNS MORE THAN MANAGER

```
SELECT E1.ENAME, E1.SAL ,  E2.ENAME , E2.SAL
FROM EMP E1 , EMP E2 WHERE
E1.MGR = E2.EMPNOAND
E1.SAL > E2.SAL ;
```

7. WAQTD EMP NAME AND HIREDATE , MANAGER NAMEAND
HIREDATE IF
MANAGER WAS HIRED BEFORE EMPLOYEE

```
SELECT E1.ENAME ,E1.HIREDATE , E2.ENAME , E2.HIREDATEFROM
EMP E1 , EMP E2

WHERE E1.MGR = E2.EMPNO

AND E2.HIREDATE < E1.HIREDATE ;
```

8. WAQTD EMP NAME AND MANAGER NAME IF BOTH ARE
WORKING IN SAME JOB

```
SELECT E1.ENAME , E2.ENAME
FROM EMP E1 , EMP E2 WHERE
E1.MGR = E2.EMPNO AND E1.JOB
= E2.JOB ;
```

9. WAQTD EMP NAME AND MANAGER NAME IF MANAGERIS
WORKING AS ACTUAL MANAGER

```
SELECT E1.ENAME , E2.ENAME
FROM EMP E1 , EMP E2 WHERE
E1.MGR = E2.EMPNO AND E2.JOB
= 'MANAGER';
```

10. WAQTD EMP NAME AND MANAGER NAME ALONG WITH THEIR
ANNUAL SALARIES IF EMPLOYEE WORKS INDEPT 10 , 20 AND
MANAGER'S SAL IS GREATER THAN EMPLOYEES SALARY .

```
SELECT E1.ENAME , E1.SAL*12 , E2.ENAME , E2.SAL*12FROM
EMP E1 , EMP E2

WHERE E1.MGR = E2.EMPNO

AND E1.DEPTNO IN ( 10,20) AND E2.SAL > E1.SAL ;
```

11. WAQTD EMPLOYEE'S NAME AND MANAGER'S
DESIGNATION FOR ALL THE EMPLOYEES

```
SELECT
E1.ENAME ,  E2.JOB
```

FROM EMP E1 , EMP E2 WHERE
E1.MGR = E2.EMPNO ;

12. WAQTD EMPLOYEE'S NAME AND MANAGER'S SALARYFOR ALL THE EMPLOYEES IF MANAGER'S SALARY ENDS WITH 50

SELECT E1.ENAME , E2.SAL
FROM EMP E1 , EMP E2 WHERE
E1.MGR = E2.EMPNOAND
E2.SAL LIKE '%50' ;

OUTER JOIN

It is used to Obtain Un-Matched Records

1. **Left Outer Join :**

   "It is used to obtain Un-Matched Records of Left Table Along with Matching Records ".

Example :

EMP

ENAME	DEPTNO
A	20
B	Null
C	10
D	Null

Left

DEPT

DNAME	DEPTNO
D1	10
D2	20
D3	30
D4	40

Right

Result Table :

ENAME	EMP.DEPTNO	DNAME	DEPT.DEPTNO
A	20	D2	20
C	10	D1	10
B	Null	Null	Null
D	Null	Null	Null

SYNTAX:

1. **ANSI** [American National Standard Institute]

```
SELECT Column_Name
FROM Table_Name1 LEFT [OUTER] JOIN Table_Name2
ON < JOIN_CONDITION> ;
EX: SELECT *
FROM EMP LEFT JOIN DEPT
ON EMP.DEPTNO = DEPT.DEPTNO ;
```

2. Oracle

```
SELECT Column_Name
    FROM Table_Name1 , Table_Name2
    WHERE Table1.Col_Name = Table2.Col_Name (+) ;

    EX: SELECT *
    FROM EMP , DEPT
    WHERE EMP.DEPTNO = DEPT.DEPTNO (+) ;
```

- WAQTD names and dnames of all the employees even though the employees Don't work in any dept .

```
SELECT ENAME , DNAME
FROM EMP , DEPT
WHERE EMP.DEPTNO = DEPT.DEPTNO(+) ;
```

ENAME	DNAME
A	D2
C	D1
B	Null
D	Null

2. Right Outer Join :

"It is used to obtain Un-Matched Records of Right Table Along with Matching Records ".

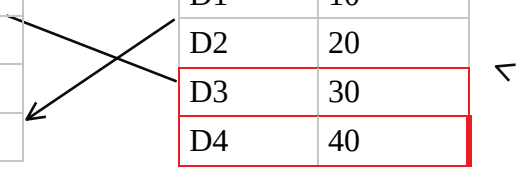
Example :

EMP

ENAME	DEPTNO
A	20
B	Null
C	10
D	Null

DEPT

DNAME	DEPTNO
D1	10
D2	20
D3	30
D4	40



Left Right

RESULT TABLE:

ENAME	EMP.DEPTNO	DNAME	DEPT.DEPTNO
A	20	D2	20
C	10	D1	10
NULL	NULL	D3	30
NULL	NULL	D4	40

SYNTAX:

1. **ANSI** [American National Standard Institute]

```
SELECT Column_Name
FROM Table_Name1 RIGHT[OUTER] JOIN Table_Name2
ON < JOIN_CONDITION> ;
```

```
SELECT *
FROM EMP RIGHT JOIN DEPT
ON EMP.DEPTNO = DEPT.DEPTNO ;
```

2. **Oracle**

```
SELECT Column_Name
FROM Table_Name1 , Table_Name2
WHERE Table1.Col_Name (+) = Table2.Col_Name  ;
```

```
SELECT *
FROM EMP  , DEPT
WHERE EMP.DEPTNO(+) = DEPT.DEPTNO ;
```

- WAQTD names and dnames of all the employees even though there are no employees in a dept .

```
SELECT ENAME , DNAME
FROM EMP , DEPT
WHERE EMP.DEPTNO(+) = DEPT.DEPTNO ;
```

ENAME	DNAME
A	D2
C	D1
Null	D3
Null	D4

3. Full Outer Join :

"It is used to obtain Un-Matched Records of both Left & Right Table Along with Matching Records ".

Example :

EMP

ENAME	DEPTNO
A	20
B	Null
C	10
D	Null

Left

DEPT

DNAME	DEPTNO
D1	10
D2	20
D3	30
D4	40

Right

Result Table :

ENAME	EMP.DEPTNO	DNAME	DEPT.DEPTNO
A	20	D2	20
C	10	D1	10
B	Null	Null	Null
D	Null	Null	Null
Null	Null	D3	30
Null	Null	D4	40

SYNTAX:

1. **ANSI** [American National Standard Institute]

```
SELECT Column_Name
FROM Table_Name1 FULL [OUTER] JOIN Table_Name2
ON < JOIN_CONDITION> ;

SELECT *
FROM EMP FULL JOIN DEPT
ON EMP.DEPTNO = DEPT.DEPTNO ;
```

- WAQTD names and dnames of all the employees and depts even though the employees Don't work in any dept and a depthaving no employees .

```
SELECT ENAME , DNAME
FROM EMP FULL OUTER  DEPT
ON EMP.DEPTNO = DEPT.DEPTNO;
```

ENAME	DNAME
A	D2
C	D1
B	Null
D	Null
Null	D3
Null	D4

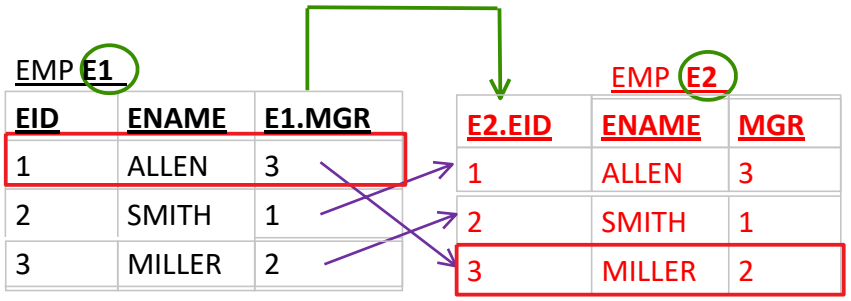
SELF JOIN

Joining a table by itself is known as Self Join

Why ? / When ?

Whenever the data to select is in the same table but present In different records we use self-join.

Example :



EMP E1

EID	ENAME	E1.MGR
1	ALLEN	3
2	SMITH	1
3	MILLER	2

EMP E2

E2.EID	ENAME	MGR
1	ALLEN	3
2	SMITH	1
3	MILLER	2

Join Condition : **E1.MGR = E2.EID**

Result table :

E1.eid	E1.ename	E1.mgr	E2.eid	E2.ename	E2.mgr
1	ALLEN	3	3	MILLER	2
2	SMITH	1	1	ALLEN	3
3	MILLER	2	2	SMITH	1

Employees Details - E1 Managers Details - E2

SYNTAX:

1. **ANSI** [American National Standard Institute]

```
SELECT Column_Name
FROM Table_Name1 JOIN Table_Name2
ON < JOIN_CONDITION> ;
```

```
SELECT *
FROM EMP E1 JOIN EMP E2
ON E1.MGR = E2.EID ;
```

```
SELECT Column_Name

FROM Table_Name1  , Table_Name2

WHERE < Join_Condition > ;


SELECT *

FROM EMP E1 , EMP E2
WHERE E1.MGR = E2.EID  ;
```

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

   ```
   SELECT E1.ENAME , E2.ENAME
   FROM EMP E1 , EMP E2
   WHERE E1.MGR = E2.EMPNO ;
   ```

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

   ```
   SELECT E1.ENAME , E1.SAL , E2.ENAME , E2.SALFROM EMP E1 , EMP E2
   WHERE E1.MGR = E2.EMPNO ;
   ```

3. WAQTD ename , manager's name along with their deptnoIf employee is working as clerk .

   ```
   SELECT E1.ENAME , E2.ENAME , E1.DEPTNO ,E2.DEPTNO
   FROM EMP E1 , EMP E2
   WHERE E1.MGR = E2.EMPNO AND E1.JOB='CLERK' ;
   ```

4. WAQTD ename , manager's job if manager works as Analyst .

   ```
   SELECT E1.ENAME , E2.JOB FROM EMP E1 , EMP E2 WHERE E1.MGR =
   E2.EMPNOAND E2.JOB ='ANALYST' ;
   ```

5. WAQTD ename and manager's name along with their job ifemp and manager are working for same designation .

   ```
   SELECT E1.ENAME , E2.ENAME , E1.JOB , E2.JOBFROM EMP E1 , EMP E2
   WHERE E1.MGR = E2.EMPNOAND E1.JOB = E2.JOB ;
   ```

6. WAQTD ename emp salary manager's name manager's salaryIf manager earns more than employee .

   ```
   SELECT E1.ENAME , E1.SAL , E2.ENAME , E2.SALFROM EMP E1 , EMP E2
   WHERE E1.MGR = E2.EMPNOAND E2.SAL > E1.SAL ;
   ```

7. WAQTD ename and manager's name along with manager'scommission if manager earns commission .

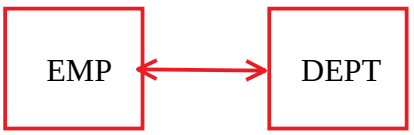
   ```
   SELECT E1.ENAME , E2.ENAME , E2.COMMFROM EMP E1 , EMP E2
   WHERE E1.MGR = E2.EMPNO AND E2.COMM IS NOT NULL ;
   ```

NOTE : TO join 'N' number of tables we need to write 'N-1' number of join conditions

EXAMPLES ON MULTIPLE CONDITIONS ON JOINS

1. WAQTD EMPLOYEE NAMES AND THEIR DEPARTMENT NAMES.

```
SELECT ENAME, DNAME
FROM EMP, DEPT
WHERE EMP.DEPTNO = DEPT.DEPTNO;
```



EMP.DEPTNO = DEPT.DEPTNO

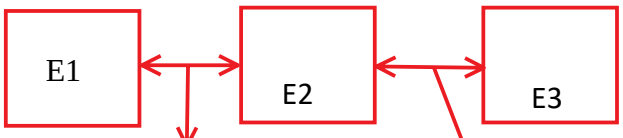
2. WAQTD NAMES OF EMPLOYEES AND THEIR MANAGERS NAMES.

```
SELECT E1.ENAME, E2.ENAME
FROM EMP E1, EMP E2
WHERE E1.MGR = E2.EMPNO;
```

E1.MGR = E2.EMPNO

3. WAQTD NAMES OF EMPS, MANAGER AND MANAGER'S MANAGER NAMES.

```
SELECT E1.ENAME, E2.ENAME, E3.ENAME
FROM EMP E1, EMP E2, EMP E3
WHERE E1.MGR = E2.EMPNO AND E2.MGR = E3.EMPNO;
```

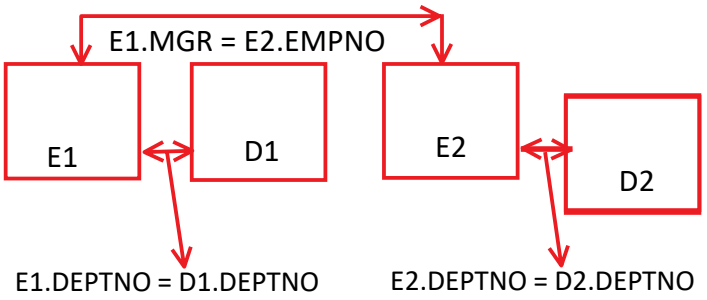


E1.MGR = E2.EMPNO

E2.MGR = E3.EMPNO

4. WAQTD NAMES OF EMPS AND THEIR DEPT AND MANAGER'S NAME AND THEIR DEPT.

```
SELECT E1.ENAME, D1.DNAME, E2.ENAME, D2.DEPTNO
FROM EMP E1, EMP E2, DEPT D1, DEPT D2
WHERE E1.MGR = E2.EMPNO
AND E1.DEPTNO = D1.DEPTNO AND E2.DEPTNO = D2.DEPTNO;
```



INNER JOIN:

E1.DEPTNO = D1.DEPTNO

E2.DEPTNO = D2.DEPTNO

SELF JOIN:

E1.MGR = E2.EMPNO