

## LAB NO-8

### PROBLEM STATEMENT:

#### Hands on Session for Joins

- Cross Join
- Equi Join or Inner Join
- Theta Join
- Self-Join
- Outer-Join

### QUERIES & RESULTS:

```
SQL> connect scott
```

```
Enter password:
```

```
Connected.
```

```
SQL> create table emp(emp_id number(3), ename varchar2(10), dept_id number(3));
```

```
Table created.
```

```
SQL> create table dept(dname varchar2(10), dept_id number(3));
```

```
Table created.
```

```
SQL> insert into emp values(&emp_id, '&ename', &dept_id);
```

```
Enter value for emp_id: 1
```

```
Enter value for ename:
```

```
deepakEnter value for
```

```
dept_id: 101
```

```
old 1: insert into emp values(&emp_id, '&ename', &dept_id)
```

```
new 1: insert into emp values(1, 'deepak', 101)
```

```
1 row created.
```

```
SQL> /
```

```
Enter value for emp_id: 2
```

```
Enter value for ename: abhi
```

```
Enter value for dept_id: 102
```

```
old 1: insert into emp values(&emp_id, '&ename', &dept_id)
```

```
new 1: insert into emp values(2, 'abhi', 102)
```

```
1 row created.
```

```
SQL> /
```

```
Enter value for emp_id: 3
```

```
Enter value for ename: aryan
```

```
Enter value for dept_id: 103
```

```
old 1: insert into emp values(&emp_id, '&ename', &dept_id)
```

```
new 1: insert into emp values(3, 'aryan', 103)
```

```
1 row created.
```

```
SQL> /
```

```
Enter value for emp_id: 4
```

```
Enter value for ename: amit
```

```
Enter value for dept_id: 101
```

```
old 1: insert into emp values(&emp_id, '&ename', &dept_id)
```

```
new 1: insert into emp values(4, 'amit', 101)
```

1 row created.

SQL> /

Enter value for emp\_id: 5

Enter value for ename: ankit

Enter value for dept\_id: 103

old 1: insert into emp values(&emp\_id, '&ename', &dept\_id)

new 1: insert into emp values(5, 'ankit', 103)

1 row created.

SQL> insert into emp values(&emp\_id, '&ename', &dept\_id);

Enter value for emp\_id: 6

Enter value for ename: Daksh

Enter value for dept\_id: 104

old 1: insert into emp values(&emp\_id, '&ename', &dept\_id)

new 1: insert into emp values(6, 'Daksh', 104)

1 row created.

SQL> select \* from emp;

EMP_ID	ENAME	DEPT_ID
1	deepak	101
2	Abhi	102
3	Aryan	103
4	Amit	101
5	Ankit	103
6	Daksh	104

SQL> insert into dept values('&dname', &dept\_id);

Enter value for dname: CSE

Enter value for dept\_id: 101

old 1: insert into dept values('&dname', &dept\_id)

new 1: insert into dept values('CSE', 101)

1 row created.

SQL> /

Enter value for dname: IT

Enter value for dept\_id: 102

old 1: insert into dept values('&dname', &dept\_id)

new 1: insert into dept values('IT', 102)

1 row created.

SQL> /

Enter value for dname: Marketing

Enter value for dept\_id: 103

old 1: insert into dept values('&dname', &dept\_id)

new 1: insert into dept values('Marketing', 103)

1 row created.

SQL> insert into dept values('&dname', &dept\_id);

Enter value for dname: Sales

Enter value for dept\_id: 105

old 1: insert into dept values('&dname', &dept\_id)

new 1: insert into dept values('Sales', 105)

SQL> select \* from dept;

DNAME	DEPT_ID
CSE	101
IT	102
Marketing	103
Sales	105

### Cross Join

SQL> select \* from emp cross join dept;

EMP_ID	ENAME	DEPT_ID	DNAME	DEPT_ID
1	deepak	101	CSE	101
2	abhi	102	CSE	101
3	aryan	103	CSE	101
4	amit	101	CSE	101
5	ankit	103	CSE	101
6	daksh	104	CSE	101
1	deepak	101	IT	102
2	abhi	102	IT	102
3	aryan	103	IT	102
4	amit	101	IT	102
5	ankit	103	IT	102

  

EMP_ID	ENAME	DEPT_ID	DNAME	DEPT_ID
6	daksh	104	IT	102
1	deepak	101	Marketing	103
2	abhi	102	Marketing	103
3	aryan	103	Marketing	103
4	amit	101	Marketing	103
5	ankit	103	Marketing	103
6	daksh	104	Marketing	103
1	deepak	101	Sales	105
2	abhi	102	Sales	105
3	aryan	103	Sales	105
4	amit	101	Sales	105

  

EMP_ID	ENAME	DEPT_ID	DNAME	DEPT_ID
5	ankit	103	Sales	105
6	daksh	104	Sales	105

24 rows selected.

### Equi Join or Inner Join

SQL> select \* from emp join dept on emp.dept\_id=dept.dept\_id;

EMP_ID	ENAME	DEPT_ID	DNAME	DEPT_ID
1	deepak	101	CSE	101
2	abhi	102	IT	102
3	aryan	103	Marketing	103
4	amit	101	CSE	101
5	ankit	103	Marketing	103

### Theta Join

select \* from emp join dept on dept.dept\_id<102;

EMP_ID	ENAME	DEPT_ID	DNAME	DEPT_ID
1	deepak	101	CSE	101
2	abhi	102	CSE	101
3	aryan	103	CSE	101
4	amit	101	CSE	101
5	ankit	103	CSE	101
6	daksh	104	CSE	101

### Self-Join

SQL> select e1.dept\_id,e1.ename,e2.ename from emp e1 INNER JOIN emp e2 on e1.emp\_id>e2.emp\_id  
AND e1.dept\_id=e2.dept\_id ORDER BY e1.dept\_id;

DEPT_ID	ENAME	ENAME
101	amit	deepak
103	ankit	aryan

### Outer Join

SQL> select \* from emp left join dept on emp.dept\_id=dept.dept\_id;

EMP_ID	ENAME	DEPT_ID	DNAME	DEPT_ID
4	amit	101	CSE	101
1	deepak	101	CSE	101
2	abhi	102	IT	102
5	ankit	103	Marketing	103
3	aryan	103	Marketing	103
6	daksh	104		

6 rows selected.

SQL> select \* from emp right join dept on emp.dept\_id=dept.dept\_id;

EMP_ID	ENAME	DEPT_ID	DNAME	DEPT_ID
1	deepak	101	CSE	101
2	abhi	102	IT	102
3	aryan	103	Marketing	103
4	amit	101	CSE	101
5	ankit	103	Marketing	103
	Sales	105		

6 rows selected.

```
SQL> select * from emp full join dept on emp.dept_id=dept.dept_id;
```

EMP_ID	ENAME	DEPT_ID	DNAME	DEPT_ID
1	deepak	101	CSE	101
2	abhi	102	IT	102
3	aryan	103	Marketing	103
4	amit	101	CSE	101
5	ankit	103	Marketing	103
6	daksh	104	Sales	105

7 rows selected.

## LAB NO-9

### PROBLEM STATEMENT:

1. Create following table:
    - Sailors (sid, name, rating, age)
    - Boats (bid, bname, color)
    - Reserves (sid, bid, day(date))
  2. Find all the information of sailors who have reserved boat number 101
  3. Find the name of the boat reserved by Bob
  4. Find the names of the sailors who have reserved at least one boat
  5. Find the names of the sailors who have reserved a red boat, and list in the order of age
  6. Find the ids and names of the sailors who have reserved two different boats on the same day
- Find the ids of sailors who have reserved a red boat or a green boat.

### QUERIES & RESULTS:

1. Create following table:
  - Sailors (sid, name, rating, age)
  - Boats (bid, bname, color)
  - Reserves (sid, bid, day(date))

SQL> connect scott

Enter password:

Connected.

SQL> create table Sailors(sid number(6),sname varchar(20),rating number(2),age number(3));

Table created.

SQL> create table Boats(bid number(6),bname varchar(20),color varchar(20));

Table created.

SQL> create table Reserves(sid number(6),bid number(6),day date);

Table created.

QL> desc Sailors;

Name	Null?	Type
SID		NUMBER(6)
SNAME		VARCHAR2(20)
RATING		NUMBER(2)
AGE		NUMBER(3)

SQL> desc Boats;

Name	Null?	Type
BID		NUMBER(6)
BNAME		VARCHAR2(20)
COLOR		VARCHAR2(20)

SQL> desc Reserves

Name	Null?	Type
SID		NUMBER(6)
BID		NUMBER(6)
DAY		DATE

SQL> insert into Sailors values(11,'Max',7,30);

1 row created.

SQL> insert into Sailors values(12,'Rex',6,35);

1 row created.

SQL> insert into Sailors values(13,'Nix',4,28);

1 row created.

SQL> insert into Sailors values(14,'Bob',8,27);

1 row created.

SQL> insert into Sailors values(15,'Mark',9,37);

1 row created.

SQL> insert into Sailors values(16,'Ann',10,30);

1 row created.

SQL> select \* from Sailors;

SID	SNAME	RATING	AGE
11	Max	7	30
12	Res	6	35
13	Nix	4	28
14	Bob	8	27
15	Mark	9	37
16	Ann	10	30

6 rows selected.

SQL> insert into Boats values(101,'Boat1','red');

1 row created.

SQL> insert into Boats values(102,'Boat2','blue');

1 row created.

SQL> insert into Boats values(103,'Boat3','green');

1 row created.

SQL> insert into Boats values(104,'Boat4','red');

1 row created.

SQL> insert into Boats values(105,'Boat5','brown');

1 row created.

SQL> select \* from Boats;

BID	BNAME	COLOR
101	Boat1	red
102	Boat2	blue
103	Boat3	green
104	Boat4	red
105	Boat5	brown

5 rows selected.

SQL> insert into Reserves values(11,101,'11-sep-2020');

1 row created.

```

SQL> insert into Reserves values(12,102,'01-oct-2021');
1 row created.
SQL> insert into Reserves values(13,102,'11-sep-2020');
1 row created.
SQL> insert into Reserves values(14,103,'09-sep-2022');
1 row created.
SQL> insert into Reserves values(15,104,'19-nov-2022');
1 row created
SQL> insert into Reserves values(16,105,'23-nov-2019');
1 row created.
SQL> insert into Reserves values(11,105,'11-sep-2020');
1 row created.
SQL> insert into Reserves values(14,104,'09-sep-2022');
1 row created.
SQL> select * from Reserves;

```

SID	BID	DAY
----	-----	-----
11	101	11-SEP-20
12	102	01-OCT-21
13	102	11-SEP-20
14	103	09-SEP-22
15	104	19-NOV-22
16	105	23-NOV-19
11	105	11-SEP-20
14	104	09-SEP-22

8 rows selected.

2. Find all the information of sailors who have reserved boat number 101

```

SQL> select sailors.sid, sailors.sname, sailors.rating, sailors.age from Sailors, Reserves, Boats where
boats.bid=101 and sailors.sid=reserves.sid and boats.bid=reserves.bid;

```

SID	SNAME	RATING	AGE
-----	-----	-----	-----
11	Max	7	30

3. Find the name of the boat reserved by Bob

```

SQL> select boats.bname from Sailors, Boats, Reserves where sailors.sid=reserves.sid and
boats.bid=reserves.bid and sailors.sname='Bob';

```

BNAME
-----
Boat3
Boat4



4. Find the names of the sailors who have reserved at least one boat

```
SQL> select distinct sailors.sname from Sailors,Reserves where sailors.sid=reserves.sid order by
sailors.sname;
```

SNAME

```
-----
Ann
Bob
Mark
Max
Nix
Rex
```

6 rows selected.

5. Find the names of the sailors who have reserved a red boat, and list in the order of age

```
SQL> select sailors.sname from Sailors , Boats, Reserves where boats.color='red' and
sailors.sid=reserves.sid and boats.bid=reserves.bid order by sailors.age;
```

SNAME

```
-----
Bob
Max
Mark
```

6. Find the ids and names of the sailors who have reserved two different boats on the same day

```
SQL> select distinct sailors.sid,sailors.sname from Sailors,Reserves r1,Reserves r2 where
sailors.sid=r1.sid and sailors.sid=r2.sid and r1.day=r2.day and r1.bid<>r2.bid;
```

SID	SNAME
11	Max
14	Bob

7. Find the ids of sailors who have reserved a red boat or a green boat.

```
select distinct sailors.sid from Sailors, Reserves, Boats where sailors.sid=reserves.sid and
boats.bid=reserves.bid and(boats.color='red' or boats.color='green');
```

SID
11
14
15

## LAB NO-10

### PROBLEM STATEMENT:

Hands on Session for SQL Subqueries

### QUERIES & RESULTS:

#### 1. Single Row Subqueries

select sname, sid, age from Sailors where sid=(select sid from Sailors where sname='Bob');

SNAME	SID	AGE
-----	-----	-----
Bob	14	27

#### 2. Multi Row Subqueries

select sname, sid, age from Sailors where sid IN(select sid from Sailors where age<=30);

SNAME	SID	AGE
-----	-----	-----
Max	11	30
Nix	13	28
Bob	14	27
Ann	16	30

#### 3. Multi Column Subqueries

SQL> select sname, sid, age, rating from Sailors where (sid, age) IN (select sid, Min(rating) from Sailors group by sid);

no rows selected

SQL> select sname, sid, age, rating from Sailors where (sid, age) IN (select sid, min(age) from Sailors group by sid);

SNAME	SID	AGE	RATING
-----	-----	-----	-----
Max	11	30	7
Rex	12	35	6
Nix	13	28	4
Bob	14	27	8
Mark	15	37	9
Ann	16	30	10

#### 4. Correlated Subqueries

SQL> select s.sname, s.sid, s.age, s.rating from Sailors s where s.sid=(select b.sid from Sailors b where b.sname='Nix');

SNAME	SID	AGE	RATING
-----	-----	-----	-----
Nix	13	28	4

## LAB NO-11

### PROBLEM STATEMENT:

1. Create following table:
  - Sailors (sid, name, rating,age)
  - Boats (bid, bname, color)
  - Reserves (sid, bid,day(date))
2. Find all the information of sailors who have reserved boat number 101
3. Find the name of the boat reserved by Bob
4. Find the names of the sailors who have reserved at least one boat
5. Find the names of the sailors who have reserved a red boat, and list in the order of age
6. Find the ids and names of the sailors who have reserved two different boats on the same day
7. Find the ids of sailors who have reserved a red boat or a green boat
8. Find the name and age of the youngest sailor
9. Count the number of different sailors' name
10. Find the average age of sailors for each rating level

### QUERIES & RESULTS:

1. Create following table:

- Sailors (sid, name, rating, age)
- Boats (bid, bname, color)
- Reserves (sid, bid, day(date))

SQL> connect scott

Enter password:

Connected.

SQL> create table Sailors(sid number(6),sname varchar(20),rating number(2),age number(3));

Table created.

SQL> create table Boats(bid number(6),bname varchar(20),color varchar(20));

Table created.

SQL> create table Reserves(sid number(6),bid number(6),day date);

Table created.

QL> desc Sailors;

Name	Null?	Type
SID		NUMBER(6)
SNAME		VARCHAR2(20)
RATING		NUMBER(2)
AGE		NUMBER(3)

SQL> desc Boats;

Name	Null?	Type
BID		NUMBER(6)
BNAME		VARCHAR2(20)
COLOR		VARCHAR2(20)

SQL> desc Reserves

Name	Null?	Type
SID		NUMBER(6)
BID		NUMBER(6)
DAY		DATE

SQL> insert into Sailors values(11,'Max',7,30);

1 row created.

SQL> insert into Sailors values(12,'Rex',6,35);

1 row created.

SQL> insert into Sailors values(13,'Nix',4,28);

1 row created.

SQL> insert into Sailors values(14,'Bob',8,27);

1 row created.

SQL> insert into Sailors values(15,'Mark',9,37);

1 row created.

SQL> insert into Sailors values(16,'Ann',10,30);

1 row created.

SQL> select \* from Sailors;

SID	SNAME	RATING	AGE
11	Max	7	30
12	Res	6	35
13	Nix	4	28
14	Bob	8	27
15	Mark	9	37
16	Ann	10	30

6 rows selected.

SQL> insert into Boats values(101,'Boat1','red');

1 row created.

SQL> insert into Boats values(102,'Boat2','blue');

1 row created.

SQL> insert into Boats values(103,'Boat3','green');

1 row created.

SQL> insert into Boats values(104,'Boat4','red');

1 row created.

SQL> insert into Boats values(105,'Boat5','brown');

1 row created.

SQL> select \* from Boats;

BID	BNAME	COLOR
-----	-------	-------

101	Boat1	red
102	Boat2	blue
103	Boat3	green
104	Boat4	red
105	Boat5	brown

5 rows selected.

SQL> insert into Reserves values(11,101,'11-sep-2020');

1 row created.

SQL> insert into Reserves values(12,102,'01-oct-2021');

1 row created.

SQL> insert into Reserves values(13,102,'11-sep-2020');

1 row created.

SQL> insert into Reserves values(14,103,'09-sep-2022');

1 row created.

SQL> insert into Reserves values(15,104,'19-nov-2022');

1 row created

SQL> insert into Reserves values(16,105,'23-nov-2019');

1 row created.

SQL> insert into Reserves values(11,105,'11-sep-2020');

1 row created.

SQL> insert into Reserves values(14,104,'09-sep-2022');

1 row created.

SQL> select \* from Reserves;

SID	BID	DAY
11	101	11-SEP-20
12	102	01-OCT-21
13	102	11-SEP-20
14	103	09-SEP-22
15	104	19-NOV-22
16	105	23-NOV-19
11	105	11-SEP-20
14	104	09-SEP-22

8 rows selected.

## 2. Find all the information of sailors who have reserved boat number 101

SQL> select sailors.sid, sailors.sname, sailors.rating, sailors.age from Sailors, Reserves, Boats where boats.bid=101 and sailors.sid=reserves.sid and boats.bid=reserves.bid;

SID	SNAME	RATING	AGE
11	Max	7	30

## 3. Find the name of the boat reserved by Bob

SQL> select boats.bname from Sailors, Boats, Reserves where sailors.sid=reserves.sid and boats.bid=reserves.bid and sailors.sname='Bob';

BNAME  
-----

Boat3  
Boat4

4. Find the names of the sailors who have reserved at least one boat

```
SQL> select distinct sailors.sname from Sailors,Reserves where sailors.sid=reserves.sid order by  
sailors.sname;
```

SNAME

```
-----  
Ann  
Bob  
Mark  
Max  
Nix  
Rex
```

6 rows selected.

5. Find the names of the sailors who have reserved a red boat, and list in the order of age

```
SQL> select sailors.sname from Sailors , Boats, Reserves where boats.color='red' and  
sailors.sid=reserves.sid and boats.bid=reserves.bid order by sailors.age;
```

SNAME

```
-----  
Bob  
Max  
Mark
```

6. Find the ids and names of the sailors who have reserved two different boats on the same day

```
SQL> select distinct sailors.sid,sailors.sname from Sailors,Reserves r1,Reserves r2 where  
sailors.sid=r1.sid and sailors.sid=r2.sid and r1.day=r2.day and r1.bid<>r2.bid;
```

SID	SNAME
11	Max
14	Bob

7. Find the ids of sailors who have reserved a red boat or a green boat.

```
select distinct sailors.sid from Sailors, Reserves, Boats where sailors.sid=reserves.sid and  
boats.bid=reserves.bid and(boats.color='red' or boats.color='green');
```

```
SID  
-----  
11  
14  
15
```

8. Find the name and the age of the youngest sailor.

```
SQL> select s.sname ,s.age from Sailors s where s.age<=ALL(select age from Sailors);
```

SNAME	AGE
-----	-----
Bob	27

9. Count the number of different sailornames.

```
SQL> select count(distinct s.sname)from Sailors s; COUNT(DISTINCTS.SNAME)
6
```

10. Find the average age of sailors foreach rating level.

```
SQL> select s.rating ,avg(s.age) as average from Sailors s group by s.rating;
```

RATING	AVERAGE
.....	-----
6	35
7	30
8	27
4	28
10	30
9	37

6 rows selected