

**NAME: GOURAV KUMAR SHAW**

**ENROLLMENT NO: 2020CSB010**

**SECTION: GX**

**SUBJECT: DBMS Lab**

## **ASSIGNMENT NO. - 6**

### **(A).Creation of Tables:**

Creating DEPT table:

#### **Query:**

```
create table DEPT (  
  DEPTNO int primary key,  
  DNAME varchar(15) ,  
  LOC varchar(10)  
);
```

```
mysql> DESC DEPT;  
+-----+-----+-----+-----+-----+-----+  
| Field | Type          | Null | Key | Default | Extra |  
+-----+-----+-----+-----+-----+-----+  
| DEPTNO | int(11)       | NO   | PRI | NULL    |       |  
| DNAME  | varchar(15)   | YES  |     | NULL    |       |  
| LOC    | varchar(10)   | YES  |     | NULL    |       |  
+-----+-----+-----+-----+-----+-----+  
3 rows in set (0.00 sec)
```

## DEPT table after insertion of values:

```
mysql> SELECT * FROM DEPT;
```

DEPTNO	DNAME	LOC
10	Accounting	New York
20	Research	Dallas
30	Sales	Chicago
40	Operations	Boston

4 rows in set (0.00 sec)

## Creating EMP table :

### Query:

```
create table EMP (  
  EMP_NO int primary key,  
  ENAME varchar(15),  
  JOB char(16),  
  MGR int references EMP(EMP_NO),  
  HIREDATE date,  
  SAL int,  
  COMM int,  
  DEPTNO int references  
  DEPT(DEPTNO) );
```

```
mysql> DESC EMP;
```

Field	Type	Null	Key	Default	Extra
EMP_NO	int(11)	NO	PRI	NULL	
ENAME	varchar(15)	YES		NULL	
JOB	char(16)	YES		NULL	
MGR	int(11)	YES		NULL	
HIREDATE	date	YES		NULL	
SAL	int(11)	YES		NULL	
COMM	int(11)	YES		NULL	
DEPTNO	int(11)	YES	MUL	NULL	

```
8 rows in set (0.01 sec)
```

## EMP table after insertion of values:

```
mysql> SELECT * FROM EMP;
```

EMP_NO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	Smith	Clerk	7902	1980-12-17	800	NULL	20
7499	Allen	Salesman	7698	1981-02-20	1600	300	30
7521	Ward	Salesman	7698	1981-02-22	1250	500	30
7566	Jones	Manager	7839	1981-04-02	2975	NULL	20
7654	Martin	Salesman	7698	1981-09-28	1250	1400	30
7698	Blake	Manager	7839	1981-05-01	2850	NULL	30
7782	Clark	Manager	7839	1981-06-09	2450	NULL	10
7788	Scott	Analyst	7566	1982-12-09	3000	NULL	20
7839	King	President	NULL	1981-11-17	5000	NULL	10
7844	Turner	Salesman	7698	1981-09-08	1500	0	30
7876	Adams	Clerk	7788	1983-01-12	1100	NULL	20
7900	James	Clerk	7698	1981-12-03	950	NULL	30
7902	Ford	Analyst	7566	1981-12-04	3000	NULL	20
7934	Miller	Clerk	7782	1982-01-23	1300	NULL	10

```
14 rows in set (0.01 sec)
```

## (B). Queries and their Solutions:

### A. Write SQL statements for the following queries using subquery:

1. Display the name of employees who earn maximum salary.

```
mysql> select ENAME from EMP
      -> where SAL = (select MAX(SAL) from EMP);
+-----+
| ENAME |
+-----+
| King  |
+-----+
1 row in set (0.00 sec)
```

2. Display the name of employees who earn maximum salary and job is salesman.

```
mysql> SELECT ENAME FROM EMP
      -> WHERE SAL = (SELECT MAX(SAL) FROM EMP WHERE JOB='Salesman');
+-----+
| ENAME |
+-----+
| Allen |
+-----+
1 row in set (0.00 sec)
```

3. Display the departments whose average salary is maximal.

```
mysql> SELECT DNAME, AVG(SAL) FROM DEPT D, EMP E
      -> WHERE D.DEPTNO=E.DEPTNO GROUP BY D.DEPTNO
      -> HAVING ROUND(AVG(SAL),4)=(SELECT MAX(SAL)
      -> FROM ((SELECT EMP.DEPTNO, ROUND (AVG(SAL),4)
      -> AS SAL FROM EMP GROUP BY EMP.DEPTNO)) AS GOURAV);
+-----+-----+
| DNAME      | AVG(SAL) |
+-----+-----+
| Accounting | 2916.6667 |
+-----+-----+
1 row in set (0.00 sec)
```

4. Display the name of employees whose salary is more than 'TURNER'.

```
mysql> select ENAME from EMP
      -> where SAL > (select SAL from EMP where ENAME = 'Turner');
+-----+
| ENAME |
+-----+
| Allen |
| Jones |
| Blake |
| Clark |
| Scott |
| King  |
| Ford  |
+-----+
7 rows in set (0.00 sec)
```

5. Display the name of employees who joined after 'ALLEN'.

```
mysql> select ENAME from EMP
      -> where HIREDATE > (select HIREDATE from EMP where ENAME = 'Allen');
+-----+
| ENAME |
+-----+
| Ward  |
| Jones |
| Martin |
| Blake |
| Clark |
| Scott |
| King  |
| Turner |
| Adams |
| James |
| Ford  |
| Miller |
+-----+
12 rows in set (0.00 sec)
```

6. Display the name of the department in which 'FORD' works.

```
mysql> select DNAME from DEPT
      -> where DEPTNO = (select DEPTNO from EMP where ENAME ='Ford');
+-----+
| DNAME  |
+-----+
| Research |
+-----+
1 row in set (0.00 sec)
```

7. Display the name of the city in which 'SMITH' works.

```
mysql> select LOC from DEPT
      -> where DEPTNO = (select D.DEPTNO from DEPT D, EMP E where E.ENAME ='Smith' and E.DEPTNO= D.DEPTNO);
+-----+
| LOC    |
+-----+
| Dallas |
+-----+
1 row in set (0.00 sec)
```

8. List names of employees who are not managers.

```
mysql> select ENAME from EMP
      -> where JOB not in
      -> (select JOB from EMP where JOB='Manager');
+-----+
| ENAME  |
+-----+
| Smith  |
| Allen  |
| Ward   |
| Martin |
| Scott  |
| King   |
| Turner |
| Adams  |
| James  |
| Ford   |
| Miller |
+-----+
11 rows in set (0.00 sec)
```

9. List the names of employees who work in 'Research' department and have joined before 30th July, 2007.

```
mysql> select ENAME from EMP where DEPTNO= (select DEPTNO from DEPT where DNAME ='Research') and HIREDATE <'2007-07-30';
```

ENAME
Smith
Jones
Scott
Adams
Ford

```
5 rows in set (0.00 sec)
```

10. Retrieve the second highest salary from EMP table.

```
mysql> select MAX(SAL) as SECOND_HIGHEST_SAL  
-> from EMP where SAL<(select MAX(SAL) from EMP);
```

SECOND_HIGHEST_SAL
3000

```
1 row in set (0.00 sec)
```

11. Find the name of the second highest paid employee(s).

```
mysql> select ENAME from EMP  
-> where SAL = (select MAX(SAL) from EMP where SAL<(select MAX(SAL) from EMP));
```

ENAME
Scott
Ford

```
2 rows in set (0.00 sec)
```

12. Retrieve the fifth highest salary from EMP table.

```
mysql> select SAL from EMP E1
      -> where ((select COUNT(DISTINCT SAL) from EMP E2 where E1.SAL <E2.SAL)=4);
+-----+
| SAL   |
+-----+
| 2450  |
+-----+
1 row in set (0.00 sec)
```

13. Enlist top five paid employees.

```
mysql> select ENAME from EMP E1
      -> where ((select COUNT( DISTINCT SAL) from EMP E2 where E1.SAL<E2.SAL)<4);
+-----+
| ENAME |
+-----+
| Jones |
| Blake |
| Scott |
| King  |
| Ford  |
+-----+
5 rows in set (0.01 sec)
```

14. List the employees who earn more than every employee in 'DALLAS'.

```
mysql> select ENAME from EMP
      -> where SAL >(select MAX(SAL) from EMP E, DEPT D where E.DEPTNO= D.DEPTNO and LOC='Dallas');
+-----+
| ENAME |
+-----+
| King  |
+-----+
1 row in set (0.00 sec)
```



15. Display the name of the departments that has no employee.

```
mysql> select DNAME from DEPT where DEPTNO not in (select DEPTNO from EMP);
+-----+
| DNAME |
+-----+
| Operations |
+-----+
1 row in set (0.01 sec)
```

16. List the name of the employees who joined in the same date of 'ADAMS'.

```
mysql> select ENAME from EMP
-> where HIREDATE = (select HIREDATE from EMP where ENAME='Adams');
+-----+
| ENAME |
+-----+
| Adams |
+-----+
1 row in set (0.00 sec)
```

17. Display the name of the departments that get commission.

```
mysql> select DNAME from DEPT
-> where DEPTNO = (select DISTINCT(DEPTNO) from EMP where COMM is not null);
+-----+
| DNAME |
+-----+
| Sales |
+-----+
1 row in set (0.00 sec)
```

18. List the employees who earn the lowest salary in their respective department.

```
mysql> select ENAME , SAL
       -> from EMP E1 where SAL=(select MIN(SAL) from EMP E2 where E1.DEPTNO=E2.DEPTNO);
```

ENAME	SAL
Smith	800
James	950
Miller	1300

```
3 rows in set (0.00 sec)
```

**B. Write SQL statements for the following queries without using any subquery:**

1. Display the manager number and the salary of the lowest paid employee for that manager. Exclude anyone whose manager is not known. Exclude any group where the minimum salary is less than \$1,000. Sort the output in descending order of salary.

```
mysql> select MGR, MIN(SAL) FROM EMP
       -> group by MGR
       -> having MGR IS NOT NULL
       -> and MIN(SAL)>=1000 order by MIN(SAL) DESC;
```

MGR	MIN(SAL)
7566	3000
7839	2450
7782	1300
7788	1100

```
4 rows in set (0.00 sec)
```

2. Write a query to display the department name, location name, number of employees, and the average salary for all employees in that department.

```
mysql> select DNAME,LOC, COUNT(DISTINCT EMP_NO),AVG(SAL)
-> from EMP E,DEPT D
-> where E.DEPTNO=D.DEPTNO group by D.DEPTNO;
```

DNAME	LOC	COUNT(DISTINCT EMP_NO)	AVG(SAL)
Accounting	New York	3	2916.6667
Research	Dallas	5	2175.0000
Sales	Chicago	6	1566.6667

3 rows in set (0.00 sec)

3. Display the employee name and employee number along with their manager's name and manager's number including King who has no manager. Label the columns EMPLOYEE, EMP#, MANAGER, MGR# respectively.

```
mysql> (select E.ENAME as EMPLOYEE, E.EMP_NO as 'EMP#' , M.ENAME as MGR ,M.MGR as 'MGR#'
-> from EMP E, EMP M where E.MGR=M.EMP_NO)
-> UNION (select ENAME, EMP_NO, NULL, NULL from EMP where MGR is NULL);
```

EMPLOYEE	EMP#	MGR	MGR#
Smith	7369	Ford	7566
Allen	7499	Blake	7839
Ward	7521	Blake	7839
Jones	7566	King	NULL
Martin	7654	Blake	7839
Blake	7698	King	NULL
Clark	7782	King	NULL
Scott	7788	Jones	7839
Turner	7844	Blake	7839
Adams	7876	Scott	7566
James	7900	Blake	7839
Ford	7902	Jones	7839
Miller	7934	Clark	7839
King	7839	NULL	NULL

14 rows in set (0.00 sec)

4. Write a query that will display the difference between the highest and lowest salaries. Label the column a DIFFERENCE.

```
mysql> select MAX(SAL)-MIN(SAL)
-> as DIFFERENCE from EMP;
+-----+
| DIFFERENCE |
+-----+
|          4200 |
+-----+
1 row in set (0.00 sec)
```

5. Write a query that will display the difference between the highest and lowest salaries for each department. Label the column a DIFF.

```
mysql> select DEPTNO, MAX(SAL)-MIN(SAL) as DIFF
-> from EMP group by DEPTNO;
+-----+-----+
| DEPTNO | DIFF |
+-----+-----+
|      10 | 3700 |
|      20 | 2200 |
|      30 | 1900 |
+-----+-----+
3 rows in set (0.00 sec)
```

6. Display the employee's names and hire dates along with their manager's names and hire dates for all employees who were hired before their managers. Label the columns EMPLOYEE, EMP HIREDATE, MANAGER and MGR HIREDATE respectively.

```
mysql> select E.ENAME as EMPLOYEE, E.HIREDATE as "EMP HIREDATE", M.ENAME as MANAGER, M.HIREDATE as "MGR HIREDATE" from EMP E, EMP M
-> where E.MGR=M.EMP_NO and E.HIREDATE<M.HIREDATE;
```

EMPLOYEE	EMP HIREDATE	MANAGER	MGR HIREDATE
Smith	1980-12-17	Ford	1981-12-04
Allen	1981-02-20	Blake	1981-05-01
Ward	1981-02-22	Blake	1981-05-01
Jones	1981-04-02	King	1981-11-17
Blake	1981-05-01	King	1981-11-17
Clark	1981-06-09	King	1981-11-17

```
6 rows in set (0.00 sec)
```