Sept 23, 2022 - SP (SQL)

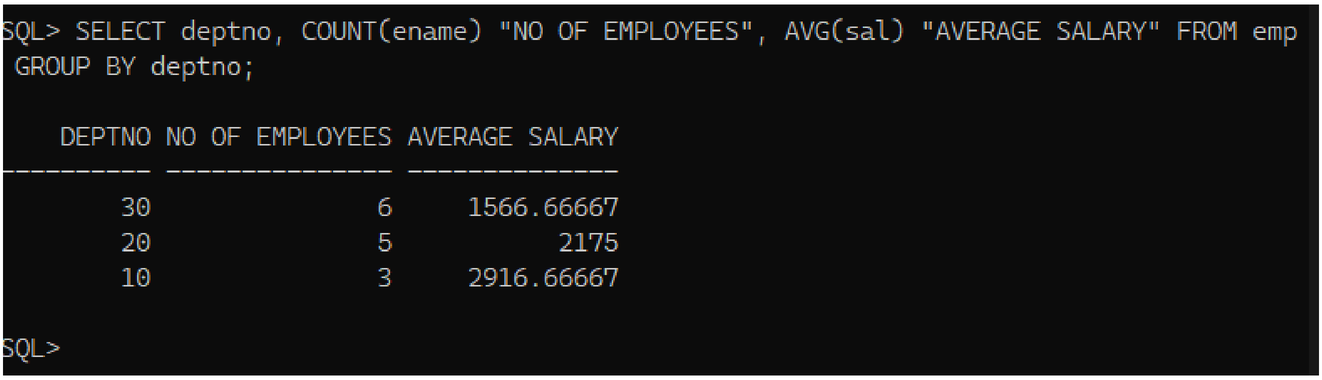
(Continuation of Sept 16, '22 class)

Check for presence of the `dept` and the `emp` tables:

```
desc dept;
desc emp;
```

Q. List the total number of employees and the average salaries of the different departments

```
SELECT deptno, COUNT(ename) "NO OF EMPLOYEES", AVG(sal) "AVERAGE SALARY"
FROM emp GROUP BY deptno;
```

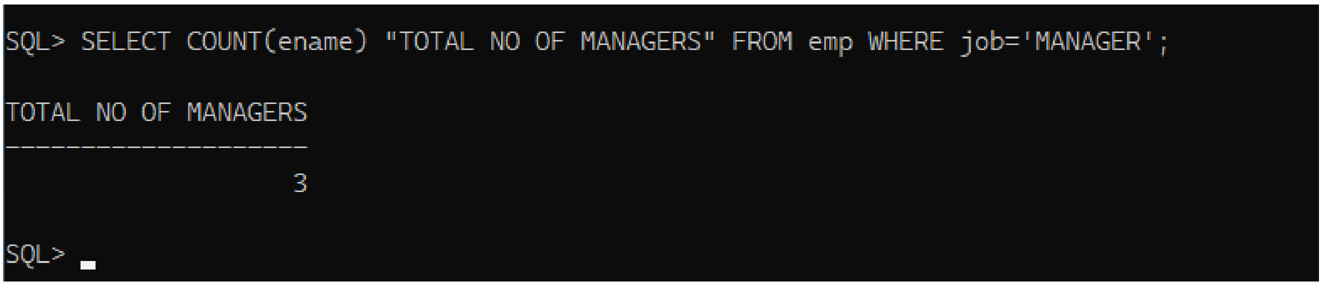


```
SQL> SELECT deptno, COUNT(ename) "NO OF EMPLOYEES", AVG(sal) "AVERAGE SALARY" FROM emp
 GROUP BY deptno;

    DEPTNO NO OF EMPLOYEES AVERAGE SALARY
---------- --------------- --------------
        30               6     1566.66667
        20               5           2175
        10               3     2916.66667

SQL>
```

If there are phrases like `FOR EACH` / `FOR ALL` / `IN EACH`, apply the `GROUP BY` operation.

Q. Calculate the total number of managers

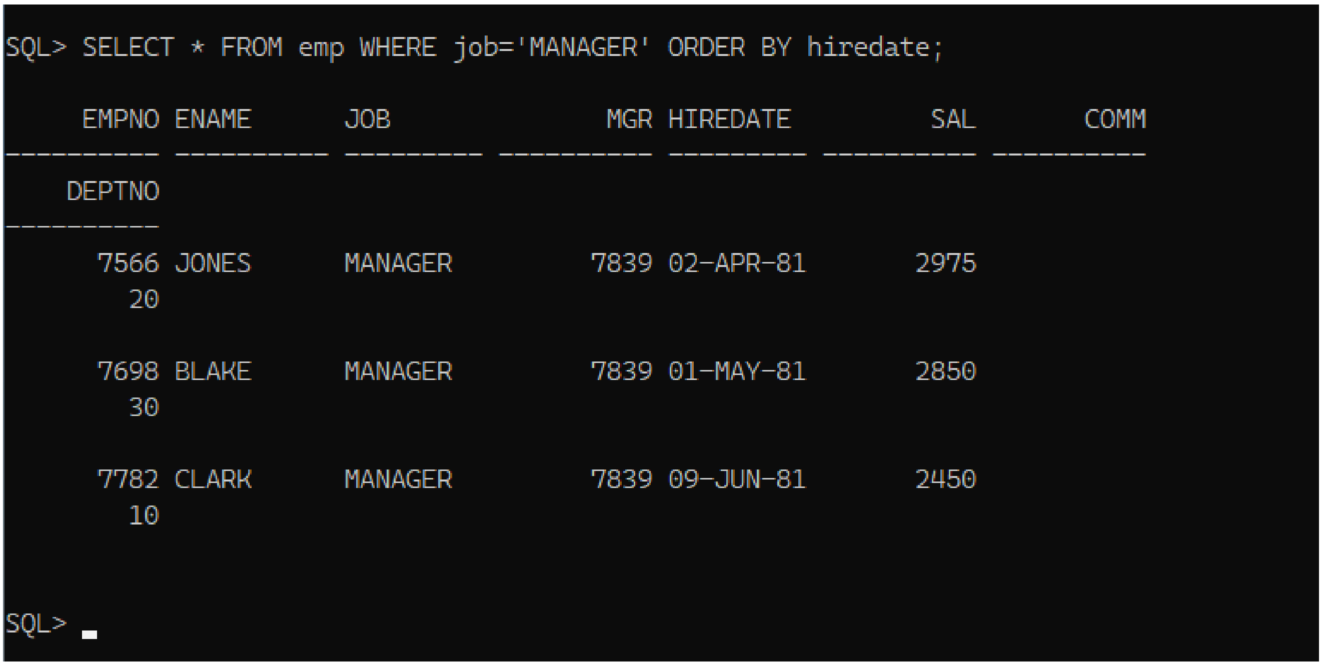
```
SELECT COUNT(ename) "TOTAL NO OF MANAGERS" FROM emp WHERE job='MANAGER';
```



```
SQL> SELECT COUNT(ename) "TOTAL NO OF MANAGERS" FROM emp WHERE job='MANAGER';

TOTAL NO OF MANAGERS
--------------------
                   3

SQL> _
```

Q. List details of all managers in ascending order of joining dates

```
SELECT * FROM emp WHERE job='MANAGER' ORDER BY hiredate;
```

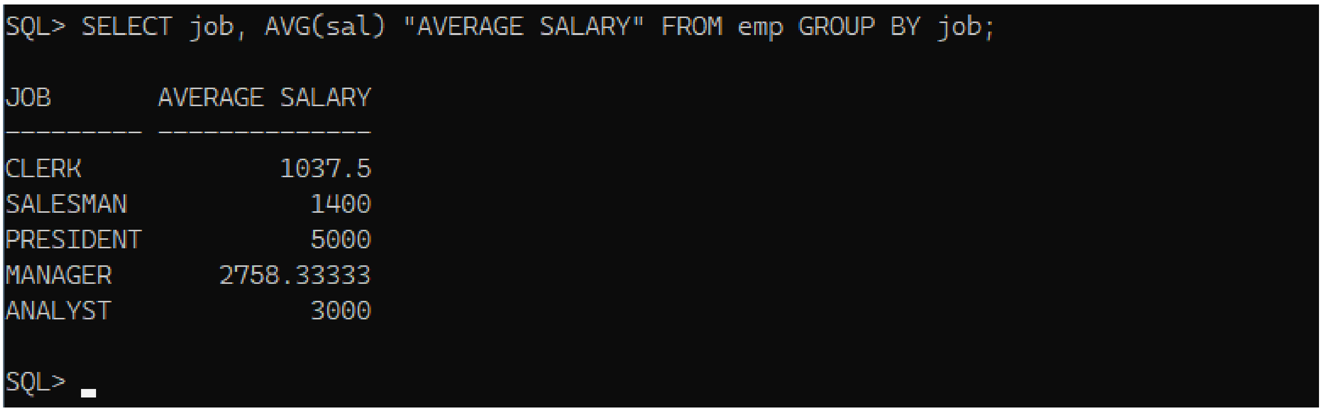


```
SQL> SELECT * FROM emp WHERE job='MANAGER' ORDER BY hiredate;

     EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM
---------- ---------- --------- ---------- --------- ---------- ----------
    DEPTNO
----------
      7566 JONES      MANAGER         7839 02-APR-81       2975
        20

      7698 BLAKE      MANAGER         7839 01-MAY-81       2850
        30

      7782 CLARK      MANAGER         7839 09-JUN-81       2450
        10


SQL>
```

List average salaries for each different job

If both `WHERE` and `GROUP BY` are present, `GROUP BY` should come at second.

```
SELECT job, AVG(sal) "AVERAGE SALARY" FROM emp GROUP BY job;
```



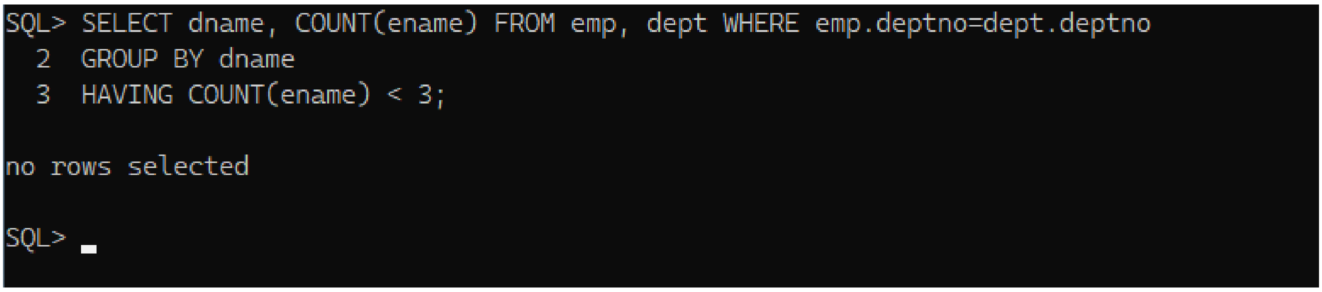
```
SQL> SELECT job, AVG(sal) "AVERAGE SALARY" FROM emp GROUP BY job;

JOB       AVERAGE SALARY
--------- --------------
CLERK             1037.5
SALESMAN            1400
PRESIDENT           5000
MANAGER       2758.33333
ANALYST             3000

SQL>
```

Queries on multiple tables

Q. Find all departments which have less than 3 employees

Here, `join` operations are performed. Whenever information is present across multiple tables, this is importent. A temporary large table is created by the `join` operation to extract informations. A `join` operation is a certesian product followed by a `WHERE` caluse.
Columns with different names from different tables will result in showing up all entries. Here, the column names are same in both tables.
Here the `join` operation is `INNER JOIN`, being the default `join` operation, we do not need to specify.

```
SELECT dname, COUNT(ename) FROM emp, dept WHERE emp.deptno=dept.deptno
GROUP BY dname HAVING COUNT(ename) < 3;
```



```
SQL> SELECT dname, COUNT(ename) FROM emp, dept WHERE emp.deptno=dept.deptno
  2  GROUP BY dname
  3  HAVING COUNT(ename) < 3;

no rows selected

SQL> _
```

Q. List the details of the employees in ascending order of department number and within each department in descending order of salary.

```
SELECT * FROM emp ORDER BY deptno ASC, sal DESC;
```

Output:

```
 EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM
```

```
DEPTNO
```

```
  7839 KING       PRESIDENT            17-NOV-81       5000
    10

  7782 CLARK      MANAGER         7839 09-JUN-81       2450
    10

  7934 MILLER     CLERK           7782 23-JAN-82       1300
    10


 EMPNO ENAME      JOB              MGR HIREDATE         SAL       COMM
```

```
DEPTNO
```

```
  7788 SCOTT      ANALYST          7566 13-JUL-87       3000
    20

  7902 FORD       ANALYST          7566 03-DEC-81       3000
    20

  7566 JONES      MANAGER          7839 02-APR-81       2975
    20


 EMPNO ENAME      JOB               MGR HIREDATE         SAL       COMM
```

```
DEPTNO
```

```
  7876 ADAMS      CLERK            7788 13-JUL-87       1100
    20

  7369 SMITH      CLERK            7902 17-DEC-80        800
    20

  7698 BLAKE      MANAGER          7839 01-MAY-81       2850
    30


 EMPNO ENAME      JOB               MGR HIREDATE         SAL       COMM
```

```
DEPTNO
```

```
  7499 ALLEN      SALESMAN         7698 20-FEB-81       1600        300
    30

  7844 TURNER     SALESMAN         7698 08-SEP-81       1500          0
    30

  7521 WARD       SALESMAN         7698 22-FEB-81       1250        500
```

```
    30


 EMPNO ENAME      JOB                MGR HIREDATE         SAL        COMM
```

```
DEPTNO
```

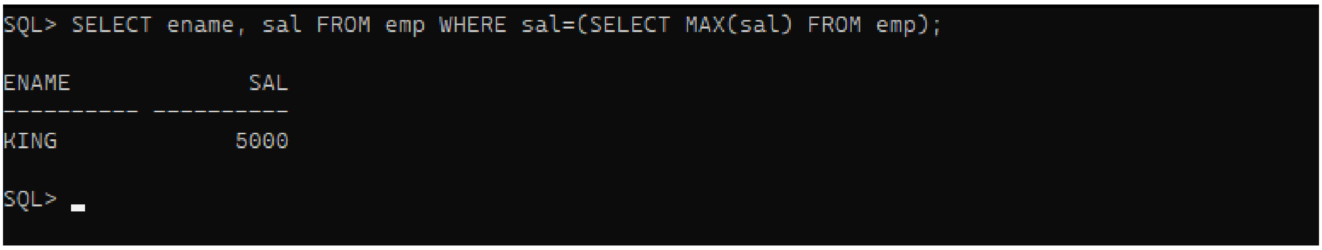
```
   7654 MARTIN     SALESMAN          7698 28-SEP-81        1250        1400
    30

   7900 JAMES      CLERK             7698 03-DEC-81         950
    30
```

14 rows selected.

Q. Display the name of employee who earns maximum salary.

This is a nested query, here one sql statement is inside of another. Nested queries will always be associated with `WHERE` clause. The inner query gets executed first in general; but there can be exceptions.

```
SELECT ename, sal FROM emp WHERE sal=(SELECT MAX(sal) FROM emp);
```



```
SQL> SELECT ename, sal FROM emp WHERE sal=(SELECT MAX(sal) FROM emp);

ENAME             SAL
---------- ----------
KING             5000

SQL> _
```