DBMS Assignment 5

Pulkit Mahajan
2019ucs0073

Question 1

Ans a)

```
SELECT dept_name, SUM(monthly_sal)
FROM instructor
GROUP BY dept_name;
```

```
MySQL  localhost:3306 ssl  institute  SQL > select dept_name, sum(monthly_sal)
                                         -> from instructor
                                         -> group by dept_name;
+------------+------------------+
| dept_name  | sum(monthly_sal) |
+------------+------------------+
| Physics    |           182000 |
| Finance    |           170000 |
| History    |           122000 |
| Comp. Sci. |           232000 |
| Elec. Eng. |            80000 |
| Biology    |            72000 |
| Music      |            40000 |
+------------+------------------+
7 rows in set (0.0106 sec)
```

Ans b)

```
SELECT dept_name
FROM instructor
GROUP BY dept_name;

SELECT COUNT(DISTINCT(dept_name))
FROM instructor;
```

```
MySQL  localhost:3306 ssl  institute  SQL > select dept_name
                                        -> from instructor
                                        -> group by dept_name;
+------------+
| dept_name  |
+------------+
| Physics    |
| Finance    |
| History    |
| Comp. Sci. |
| Elec. Eng. |
| Biology    |
| Music      |
+------------+
7 rows in set (0.0005 sec)
```

```
MySQL  localhost:3306 ssl  institute  SQL > select count(distinct(dept_name))
                                         -> from instructor;
+----------------------------+
| count(distinct(dept_name)) |
+----------------------------+
|                          7 |
+----------------------------+
1 row in set (0.0005 sec)
```

Ans c)

```
SELECT SUM(monthly_sal)
FROM instructor;
```

```
MySQL  localhost:3306 ssl  institute  SQL > select sum(monthly_sal)
                                         -> from instructor;
+------------------+
| sum(monthly_sal) |
+------------------+
|           898000 |
+------------------+
1 row in set (0.0004 sec)
```

Ans d)

```
SELECT name, MIN(monthly_sal)
FROM instructor
WHERE monthly_sal = (SELECT MIN(monthly_sal) from instructor);
```

```
MySQL localhost:3306 ssl institute SQL > select name, monthly_sal
                                       -> from instructor
                                       -> where monthly_sal = (select min(monthly_sal) from instructor);
+--------+-------------+
| name   | monthly_sal |
+--------+-------------+
| Mozart |       40000 |
+--------+-------------+
1 row in set (0.0372 sec)
```

Question 2

Ans a)

```
SELECT DISTINCT(building)
FROM section;

SELECT COUNT(DISTINCT(building))
FROM section;
```

```
MySQL localhost:3306 ssl institute SQL > select distinct(building)
                                       -> from section;
+----------+
| building |
+----------+
| Painter  |
| Packard  |
| Taylor   |
| Watson   |
+----------+
4 rows in set (0.0006 sec)
MySQL localhost:3306 ssl institute SQL > select count(distinct(building))
                                       -> from section;
+----------------------------+
| count(distinct(building)) |
+----------------------------+
|                          4 |
+----------------------------+
1 row in set (0.0006 sec)
```

Ans b)

```
SELECT COUNT(DISTINCT(building))
FROM section
WHERE course_id LIKE "CS%";
```

```
MySQL  localhost:3306 ssl  institute  SQL > select count(distinct(building))
                                         -> from section
                                         -> where course_id like 'CS%';
+---------------------------+
| count(distinct(building)) |
+---------------------------+
|                         3 |
+---------------------------+
1 row in set (0.0113 sec)
```

Ans c)

```
SELECT semester, count(semester)
FROM section
GROUP BY semester
ORDER BY COUNT(semester) DESC LIMIT 1;
```

```
MySQL  localhost:3306 ssl  institute  SQL > select semester, count(semester)
                                         -> from section
                                         -> group by semester
                                         -> order by count(semester) desc limit 1;
+----------+-----------------+
| semester | count(semester) |
+----------+-----------------+
| Spring   |              10 |
+----------+-----------------+
1 row in set (0.0005 sec)
```

Interpretation 2 of question 2(c):
Semesters offer different courses in different year. So a particular semester can be uniquely identified by the semester name, and the year.
So in this interpretation Spring semester of 2010 offered the most number of courses.

```
SELECT semester, year, COUNT(semester)
FROM section
GROUP BY semester, year
ORDER BY COUNT(semester) DESC LIMIT 1;
```

```
MySQL  localhost:3306 ssl  institute  SQL > select semester, year, count(semester)
                                         -> from section
                                         -> group by semester, year
                                         -> order by count(semester) desc limit 1;
+----------+------+-----------------+
| semester | year | count(semester) |
+----------+------+-----------------+
| Spring   | 2010 |               7 |
+----------+------+-----------------+
1 row in set (0.0006 sec)
```

Question 3.

Ans a)

```
SELECT dept_name, AVG(budget)
FROM department
GROUP BY dept_name;
```

Note that the objects in dept_name are all unique so average budget for each department is the budget itself.

```
MySQL  localhost:3306 ssl  institute  SQL > select dept_name, avg(budget)
                                         -> from department
                                         -> group by dept_name;
+------------+-------------+
| dept_name  | avg(budget) |
+------------+-------------+
| Biology    |  90000.0000 |
| Comp. Sci. | 100000.0000 |
| Elec. Eng. |  85000.0000 |
| Finance    | 120000.0000 |
| History    |  50000.0000 |
| Music      |  80000.0000 |
| Physics    |  70000.0000 |
+------------+-------------+
7 rows in set (0.0106 sec)
```

Ans b)

```
SELECT COUNT(dept_name)
FROM department
WHERE budget > (SELECT AVG(budget) from department);
/*listing all such departments*/
SELECT dept_name, budget
FROM department
```

```
WHERE budget > (SELECT AVG(budget) from department);
```

```
MySQL  localhost:3306 ssl  institute  SQL > select count(dept_name)
                                         -> from department
                                         -> where budget > (select avg(budget) from department);
+-----------------+
| count(dept_name) |
+-----------------+
|               3 |
+-----------------+
1 row in set (0.0006 sec)
```

```
MySQL  localhost:3306 ssl  institute  SQL > select avg(budget) from department;
+--------------+
| avg(budget) |
+--------------+
|  85000.0000 |
+--------------+
1 row in set (0.0004 sec)
```

```
MySQL  localhost:3306 ssl  institute  SQL > select dept_name, budget
                                         -> from department
                                         -> where budget > (select avg(budget) from department);
+------------+--------+
| dept_name  | budget |
+------------+--------+
| Biology    |  90000 |
| Comp. Sci. | 100000 |
| Finance    | 120000 |
+------------+--------+
3 rows in set (0.0008 sec)
```

Ans c)

```
SELECT COUNT(dept_name)
FROM department
WHERE budget < (SELECT AVG(budget) from department);
/*Listing all such departments*/
SELECT dept_name, budget
FROM department
WHERE budget < (select AVG(budget) from department);
```

```
MySQL  localhost:3306 ssl  institute  SQL > select count(dept_name)
                                         -> from department
                                         -> where budget < (select avg(budget) from department);
+-----------------+
| count(dept_name) |
+-----------------+
|               3 |
+-----------------+
1 row in set (0.0005 sec)
```

```
MySQL  localhost:3306 ssl  institute  SQL > select avg(budget) from department;
+-------------+
| avg(budget) |
+-------------+
|  85000.0000 |
+-------------+
1 row in set (0.0004 sec)
MySQL  localhost:3306 ssl  institute  SQL > select dept_name, budget
                                        -> from department
                                        -> where budget < (select avg(budget) from department);
+-----------+--------+
| dept_name | budget |
+-----------+--------+
| History   |  50000 |
| Music     |  80000 |
| Physics   |  70000 |
+-----------+--------+
3 rows in set (0.0005 sec)
```