CS3120 Database Management Systems Laboratory

Assignment – 4

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Assignment:

Write the following queries in SQL, using the university schema.

1. **Display the department name whose average salary in the year 2010 is greater than 50000.**

```
MariaDB [university]> select dept_name from (
    -> select distinct teaches.ID as ID, dept_name, salary
    -> from instructor
    -> inner join teaches on instructor.ID = teaches.ID
    -> where year=2010
    -> ) as temp
    -> group by dept_name
    -> having AVG(salary) > 50000;
+------------+
| dept_name  |
+------------+
| Biology    |
| Comp. Sci. |
| Finance    |
| History    |
+------------+
4 rows in set (0.001 sec)
```

2. **(a) Insert a record in the table 'Student' with the following values**
   - **ID = 'last 4 digits of your institute roll number'**
   - **Name = 'Your first name'**
   - **Dept_name = 'Comp. Sci.'**
   - **Total_credits = 12**

```
MariaDB [university]> insert into student values (1047, 'Yogesh', 'Comp. Sci.', 12);
Query OK, 1 row affected (0.001 sec)
```

(b) **Show students between your credit and topper or least scorer's credit (whichever is farthest) arranged in descending order.**

```
MariaDB [university]> select student.*
    -> from student, (
    ->     select *
    ->     from (
    ->             select MIN(tot_cred) as lowest, MAX(tot_cred) as highest
    ->             from student
    ->         ) as ends,
    ->         (
    ->             select tot_cred as mine
    ->             from student
    ->             where ID=1047
    ->         ) as self
    -> ) as temp
    -> where student.tot_cred
    -> between (if(mine-lowest > highest-mine, lowest, mine))
    -> and (if(mine-lowest > highest-mine, mine, highest))
    -> order by tot_cred desc ;
+-------+----------+------------+----------+
| ID    | name     | dept_name  | tot_cred |
+-------+----------+------------+----------+
| 98988 | Tanaka   | Biology    |      120 |
| 23121 | Chavez   | Finance    |      110 |
| 00128 | Zhang    | Comp. Sci. |      102 |
| 98765 | Bourikas | Elec. Eng. |       98 |
| 19991 | Brandt   | History    |       80 |
| 76653 | Aoi      | Elec. Eng. |       60 |
| 76543 | Brown    | Comp. Sci. |       58 |
| 44553 | Peltier  | Physics    |       56 |
| 54321 | Williams | Comp. Sci. |       54 |
| 45678 | Levy     | Physics    |       46 |
| 55739 | Sanchez  | Music      |       38 |
| 12345 | Shankar  | Comp. Sci. |       32 |
| 1047  | Yogesh   | Comp. Sci. |       12 |
+-------+----------+------------+----------+
13 rows in set (0.001 sec)
```

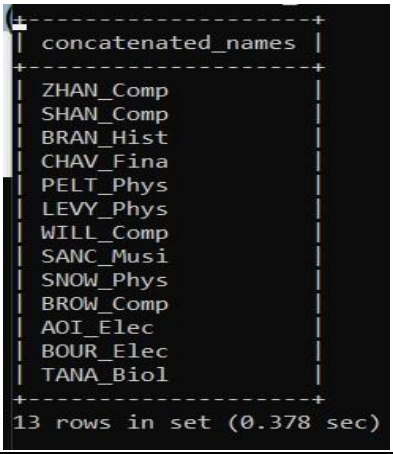
(c) **Delete the record.**

```
MariaDB [university]> delete from student
    -> where ID=1047;
Query OK, 1 row affected (0.001 sec)
```

3. **Display the total salary of all the advisors whose name starts with the letter K.**

```
MariaDB [university]> select sum(salary) as total_salary
    -> from (
    -> select distinct salary
    -> from instructor
    ->       inner join advisor on instructor.ID = advisor.i_ID
    -> where name like 'K%'
    -> ) as salaryTable;
+--------------+
| total_salary |
+--------------+
|    155000.00 |
+--------------+
1 row in set (0.001 sec)
```

4. **Show output as below using string queries:**



```
+--------------------+
| concatenated_names |
+--------------------+
| ZHAN_Comp          |
| SHAN_Comp          |
| BRAN_Hist          |
| CHAV_Fina          |
| PELT_Phys          |
| LEVY_Phys          |
| WILL_Comp          |
| SANC_Musi          |
| SNOW_Phys          |
| BROW_Comp          |
| AOI_Elec           |
| BOUR_Elec          |
| TANA_Biol          |
+--------------------+
13 rows in set (0.378 sec)
```

```
MariaDB [university]> select concat(upper(substring(name, 1, 4)), '_', substring(dept_name, 1, 4)) as concatenated_names
    -> from student;
+--------------------+
| concatenated_names |
+--------------------+
| ZHAN_Comp          |
| SHAN_Comp          |
| BRAN_Hist          |
| CHAV_Fina          |
| PELT_Phys          |
| LEVY_Phys          |
| WILL_Comp          |
| SANC_Musi          |
| SNOW_Phys          |
| BROW_Comp          |
| AOI_Elec           |
| BOUR_Elec          |
| TANA_Biol          |
+--------------------+
13 rows in set (0.001 sec)
```

5. **Show output on cross joined section and course table having (ta,at,ka) in building names,CS having course_id of section table and having department from 'Comp. sci.'**

```
MariaDB [university]> select *
    -> from section, course
    -> where (building like '%ta%' or building like '%at%' or building like '%ka%')
    -> and (section.course_id like 'CS%')
    -> and (dept_name='Comp. Sci.');
```

course_id	sec_id	semester	year	building	room_number	time_slot_id	course_id	title	dept_name	credits
CS-101	1	Fall	2009	Packard	101	H	CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-101	1	Spring	2010	Packard	101	F	CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-190	1	Spring	2009	Taylor	3128	E	CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-190	2	Spring	2009	Taylor	3128	A	CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-315	1	Spring	2010	Watson	120	D	CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-319	1	Spring	2010	Watson	100	B	CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-319	2	Spring	2010	Taylor	3128	C	CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-347	1	Fall	2009	Taylor	3128	A	CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-101	1	Fall	2009	Packard	101	H	CS-190	Game Design	Comp. Sci.	4
CS-101	1	Spring	2010	Packard	101	F	CS-190	Game Design	Comp. Sci.	4
CS-190	1	Spring	2009	Taylor	3128	E	CS-190	Game Design	Comp. Sci.	4
CS-190	2	Spring	2009	Taylor	3128	A	CS-190	Game Design	Comp. Sci.	4
CS-315	1	Spring	2010	Watson	120	D	CS-190	Game Design	Comp. Sci.	4
CS-319	1	Spring	2010	Watson	100	B	CS-190	Game Design	Comp. Sci.	4
CS-319	2	Spring	2010	Taylor	3128	C	CS-190	Game Design	Comp. Sci.	4
CS-347	1	Fall	2009	Taylor	3128	A	CS-190	Game Design	Comp. Sci.	4
CS-101	1	Fall	2009	Packard	101	H	CS-315	Robotics	Comp. Sci.	3
CS-101	1	Spring	2010	Packard	101	F	CS-315	Robotics	Comp. Sci.	3
CS-190	1	Spring	2009	Taylor	3128	E	CS-315	Robotics	Comp. Sci.	3
CS-190	2	Spring	2009	Taylor	3128	A	CS-315	Robotics	Comp. Sci.	3
CS-315	1	Spring	2010	Watson	120	D	CS-315	Robotics	Comp. Sci.	3
CS-319	1	Spring	2010	Watson	100	B	CS-315	Robotics	Comp. Sci.	3
CS-319	2	Spring	2010	Taylor	3128	C	CS-315	Robotics	Comp. Sci.	3
CS-347	1	Fall	2009	Taylor	3128	A	CS-315	Robotics	Comp. Sci.	3
CS-101	1	Fall	2009	Packard	101	H	CS-319	Image Processing	Comp. Sci.	3
CS-101	1	Spring	2010	Packard	101	F	CS-319	Image Processing	Comp. Sci.	3
CS-190	1	Spring	2009	Taylor	3128	E	CS-319	Image Processing	Comp. Sci.	3
CS-190	2	Spring	2009	Taylor	3128	A	CS-319	Image Processing	Comp. Sci.	3
CS-315	1	Spring	2010	Watson	120	D	CS-319	Image Processing	Comp. Sci.	3
CS-319	1	Spring	2010	Watson	100	B	CS-319	Image Processing	Comp. Sci.	3
CS-319	2	Spring	2010	Taylor	3128	C	CS-319	Image Processing	Comp. Sci.	3
CS-347	1	Fall	2009	Taylor	3128	A	CS-319	Image Processing	Comp. Sci.	3
CS-101	1	Fall	2009	Packard	101	H	CS-347	Database System Concepts	Comp. Sci.	3
CS-101	1	Spring	2010	Packard	101	F	CS-347	Database System Concepts	Comp. Sci.	3
CS-190	1	Spring	2009	Taylor	3128	E	CS-347	Database System Concepts	Comp. Sci.	3
CS-190	2	Spring	2009	Taylor	3128	A	CS-347	Database System Concepts	Comp. Sci.	3
CS-315	1	Spring	2010	Watson	120	D	CS-347	Database System Concepts	Comp. Sci.	3
CS-319	1	Spring	2010	Watson	100	B	CS-347	Database System Concepts	Comp. Sci.	3
CS-319	2	Spring	2010	Taylor	3128	C	CS-347	Database System Concepts	Comp. Sci.	3
CS-347	1	Fall	2009	Taylor	3128	A	CS-347	Database System Concepts	Comp. Sci.	3

40 rows in set (0.002 sec)

6. **Show name and salary of instructors in finance and biology in descending order of their salary.**

```
MariaDB [university]> select name, salary
    -> from instructor
    -> where dept_name='finance' or dept_name='biology'
    -> order by salary desc ;
```

name	salary
Wu	90000.00
Singh	80000.00
Crick	72000.00

3 rows in set (0.001 sec)

7. **Show all the instructors with salary = Null and instructors with salary = NOT NULL. (HINT: first set salary of 3-4 instructors as NULL).**

All instructors starting with ‘C’ or ‘E’, their salary is set to null.

```
MariaDB [university]> update instructor
    -> set salary=NULL
    -> where name like 'C%' or name like 'E%';
Query OK, 4 rows affected (0.002 sec)
Rows matched: 4  Changed: 4  Warnings: 0
```

Instructors with null as their salary.

```
MariaDB [university]> select *
    -> from instructor
    -> where salary is null ;
+-------+-----------+-----------+--------+
| ID    | name      | dept_name | salary |
+-------+-----------+-----------+--------+
| 22222 | Einstein  | Physics   |   NULL |
| 32343 | El Said   | History   |   NULL |
| 58583 | Califieri | History   |   NULL |
| 76766 | Crick     | Biology   |   NULL |
+-------+-----------+-----------+--------+
4 rows in set (0.001 sec)
```

Instructors with their salary available.

```
MariaDB [university]> select *
    -> from instructor
    -> where salary is not null ;
+-------+------------+------------+----------+
| ID    | name       | dept_name  | salary   |
+-------+------------+------------+----------+
| 10101 | Srinivasan | Comp. Sci. | 65000.00 |
| 12121 | Wu         | Finance    | 90000.00 |
| 15151 | Mozart     | Music      | 40000.00 |
| 33456 | Gold       | Physics    | 87000.00 |
| 45565 | Katz       | Comp. Sci. | 75000.00 |
| 76543 | Singh      | Finance    | 80000.00 |
| 83821 | Brandt     | Comp. Sci. | 92000.00 |
| 98345 | Kim        | Elec. Eng. | 80000.00 |
+-------+------------+------------+----------+
8 rows in set (0.000 sec)
```

8. **Show name, three times repeated name from student table:**

```
MariaDB [university]> select name, concat(name, repeat(lower(name), 2)) as name_3x_repeat
    -> from student;
+----------+-------------------------+
| name     | name_3x_repeat          |
+----------+-------------------------+
| Zhang    | Zhangzhangzhang         |
| Shankar  | Shankarshankarshankar   |
| Brandt   | Brandtbrandtbrandt      |
| Chavez   | Chavezchavezchavez      |
| Peltier  | Peltierpeltierpeltier   |
| Levy     | Levylevylevy            |
| Williams | Williamswilliamswilliams |
| Sanchez  | Sanchezsanchezsanchez   |
| Snow     | Snowsnowsnow            |
| Brown    | Brownbrownbrown         |
| Aoi      | Aoiaoiaoi               |
| Bourikas | Bourikasbourikasbourikas |
| Tanaka   | Tanakatanakatanaka      |
+----------+-------------------------+
13 rows in set (0.000 sec)
```

9. **Show name, length of name and grades of students with grades equal 'A','B','A-'.**

```
MariaDB [university]> select distinct name, length(name), grade
    -> from student
    -> inner join takes on student.ID = takes.ID
    -> where grade in ('A', 'B', 'A-');
+----------+--------------+-------+
| name     | length(name) | grade |
+----------+--------------+-------+
| Zhang    |            5 | A     |
| Zhang    |            5 | A-    |
| Shankar  |            7 | A     |
| Brandt   |            6 | B     |
| Levy     |            4 | B     |
| Williams |            8 | A-    |
| Sanchez  |            7 | A-    |
| Brown    |            5 | A     |
| Bourikas |            8 | B     |
| Tanaka   |            6 | A     |
+----------+--------------+-------+
10 rows in set (0.002 sec)
```

10. Show courses where course name has ‘comp’ in it.

```
MariaDB [university]> select *
    -> from course
    -> where title like '%comp%';
+-----------+-----------------------------+------------+---------+
| course_id | title                       | dept_name  | credits |
+-----------+-----------------------------+------------+---------+
| BIO-399   | Computational Biology       | Biology    |       3 |
| CS-101    | Intro. to Computer Science | Comp. Sci. |       4 |
+-----------+-----------------------------+------------+---------+
2 rows in set (0.000 sec)
```