# Database Management Systems

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**TY Comp Div-2,  T4 Batch**

# Asssignment - 2

## University Schema

```
MariaDB [University]> show tables;
+-----------------------+
| Tables_in_university  |
+-----------------------+
| advisor               |
| classroom             |
| course                |
| department            |
| instructor            |
| prereq                |
| section               |
| student               |
| takes                 |
| teaches               |
| teaching_assistant    |
| time_slot             |
+-----------------------+
12 rows in set (0.001 sec)
```

Find the number of instructors who have never taught any course. If the result of your query is empty, add the appropriate data (and include corresponding insert statements) to ensure the result is not empty.

```
MariaDB [University]> select count(*) as num_instructors from instructor
    → where id not in (select distinct(id) from teaches);
+-----------------+
| num_instructors |
+-----------------+
|               3 |
+-----------------+
1 row in set (0.001 sec)
```

Find the total capacity of every building in the university.

```
MariaDB [University]> select building, sum(capacity) as total_capacity from classroom group by building;
+----------+----------------+
| building | total_capacity |
+----------+----------------+
| Packard  |            500 |
| Painter  |             10 |
| Taylor   |             70 |
| Watson   |             80 |
+----------+----------------+
4 rows in set (0.000 sec)
```

Find all departments that have at least one instructor, and list the names of the departments along with the number of instructors;   order the result in descending order of number of instructors.

```
MariaDB [University]> select d.dept_name, count(i.id) as num_instructor
    → from department d left join instructor i on d.dept_name=i.dept_name
    → group by d.dept_name having num_instructor>0
    → order by num_instructor desc;
+------------+----------------+
| dept_name  | num_instructor |
+------------+----------------+
| Comp. Sci. |              3 |
| Finance    |              2 |
| Physics    |              2 |
| History    |              2 |
| Elec. Eng. |              1 |
| Music      |              1 |
| Biology    |              1 |
+------------+----------------+
7 rows in set (0.000 sec)
```

For each student, compute the total credits they have successfully completed, i.e. total credits of courses they have taken, for which they have a non-null grade other than 'F'. Do NOT use the tot_credits attribute of student.

```
MariaDB [University]> select s.id as s_id, s.name as s_name, ifnull(sum(c.credits),0) as credits from student s
    → left join takes t on s.id=t.id
    → left join course c on t.course_id=c.course_id and t.grade is not null and grade not like "F"
    → group by s.id, s.name;
+-------+----------+---------+
| s_id  | s_name   | credits |
+-------+----------+---------+
| 00128 | Zhang    |       7 |
| 12345 | Shankar  |      14 |
| 19991 | Brandt   |       3 |
| 23121 | Chavez   |       3 |
| 44553 | Peltier  |       4 |
| 45678 | Levy     |       7 |
| 54321 | Williams |       8 |
| 55739 | Sanchez  |       3 |
| 70557 | Snow     |       0 |
| 76543 | Brown    |       7 |
| 76653 | Aoi      |       3 |
| 98765 | Bourikas |       7 |
| 98988 | Tanaka   |       4 |
+-------+----------+---------+
13 rows in set (0.002 sec)
```

Find the id and title of all courses which do not require any prerequisites.

```
MariaDB [University]> select course_id, title from course where course_id not in (select course_id from prereq);
+-----------+-------------------------+
| course_id | title                   |
+-----------+-------------------------+
| BIO-101   | Intro. to Biology       |
| CS-101    | Intro. to Computer Science |
| FIN-201   | Investment Banking      |
| HIS-351   | World History           |
| MU-199    | Music Video Production  |
| PHY-101   | Physical Principles     |
+-----------+-------------------------+
6 rows in set (0.001 sec)
```

Find the names of students who have not taken any biology dept. courses.

```
MariaDB [University]> select name from student
    → where id not in (select distinct t.id from takes t inner join course c on t.course_id=c.course_id
    → where c.dept_name='Biology');
+----------+
| name     |
+----------+
| Zhang    |
| Shankar  |
| Brandt   |
| Chavez   |
| Peltier  |
| Levy     |
| Williams |
| Sanchez  |
| Snow     |
| Brown    |
| Aoi      |
| Bourikas |
+----------+
12 rows in set (0.001 sec)
```