

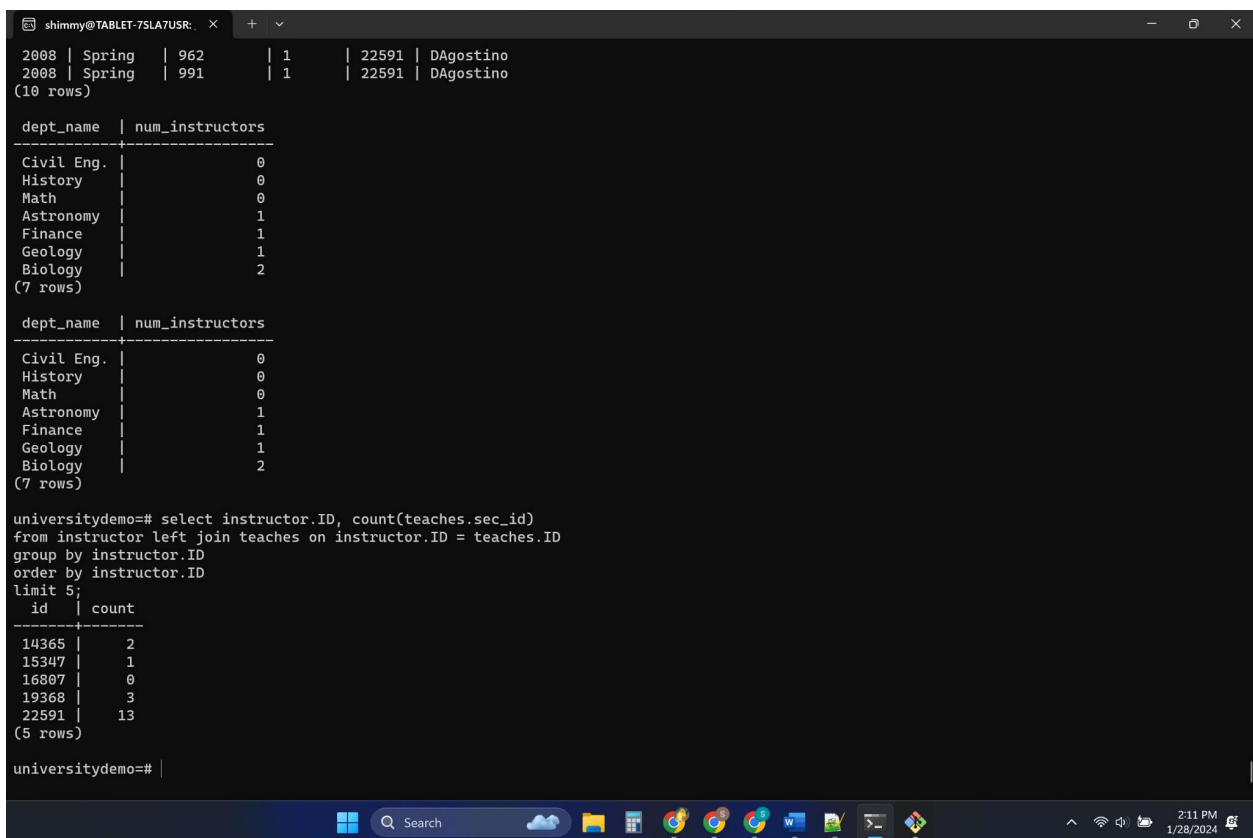
## SQL3 Writeup

I have my answers to questions 1-5 in SQL31.sql, as you suggested we do. This document has queries 6-8 on the university database, as you wanted.

**Query 6:** “Return all instructors, but include only their IDs and the number of sections taught by that instructor. If an instructor has not taught any section, return 0. Order the result set by ascending instructor id, return no more than five results.

```
select instructor.ID, count(teaches.sec_id)
from instructor left join teaches on instructor.ID = teaches.ID
group by instructor.ID
order by instructor.ID
limit 5;
```

Result:



```
shimmy@TABLET-75LA7USR: x + v
2008 | Spring | 962 | 1 | 22591 | DAgostino
2008 | Spring | 991 | 1 | 22591 | DAgostino
(10 rows)

dept_name | num_instructors
-----+-----
Civil Eng. | 0
History | 0
Math | 0
Astronomy | 1
Finance | 1
Geology | 1
Biology | 2
(7 rows)

dept_name | num_instructors
-----+-----
Civil Eng. | 0
History | 0
Math | 0
Astronomy | 1
Finance | 1
Geology | 1
Biology | 2
(7 rows)

universitydemo=# select instructor.ID, count(teaches.sec_id)
from instructor left join teaches on instructor.ID = teaches.ID
group by instructor.ID
order by instructor.ID
limit 5;
 id | count
-----+-----
14365 | 2
15347 | 1
16807 | 0
19368 | 3
22591 | 13
(5 rows)

universitydemo=#
```

**Query 7:** “Return all course sections offered in 2008, together with the ID and name of each instructor teaching the section”. If a section has more than one instructor, that section should appear as many times in the result as it has instructors. If a section does not have any instructor, it should still appear in the result with the instructor name set to “—”.

- Each tuple must include: year, semester, course id, section id, instructor id, instructor name
- Order by ascending year, and, within that ordering, by ascending course id.
- Return no more than twelve tuples.

For this one, I am a little confused. Many of the edge cases you mention – no listed instructor, sections with multiple instructors, more than 12 sections – simply don’t appear in the results. But anyway:

```
select section.year, section.semester, section.course_id,  
       section.sec_id, coalesce(teaches.ID, '-') as ID,  
       coalesce(instructor.name, '-') as name  
from section full join teaches  
       on section.course_id = teaches.course_id  
       and section.sec_id = teaches.sec_id  
       and section.semester = teaches.semester  
       and section.year = teaches.year  
       left join instructor on teaches.ID = instructor.ID  
where section.year = 2008  
order by section.course_id  
limit 12;
```

Result:

```
shimmy@TABLET-75LA7USR: x + v
year | semester | course_id | sec_id | id | name
-----+-----+-----+-----+-----+-----
2008 | Spring   | 158       | 2      | 99052 | Dale
2008 | Fall     | 158       | 1      | 90376 | Bietzk
2008 | Spring   | 237       | 1      | 99052 | Dale
2008 | Spring   | 345       | 1      | 79081 | Ullman
2008 | Spring   | 349       | 1      | 6569  | Mingoz
2008 | Spring   | 362       | 3      | 6569  | Mingoz
2008 | Spring   | 704       | 1      | 77346 | Mahmoud
2008 | Spring   | 852       | 1      | 63287 | Jaekel
2008 | Spring   | 962       | 1      | 22591 | DAgostino
2008 | Spring   | 991       | 1      | 22591 | DAgostino
(10 rows)

universitydemo=# select section.year, section.semester, section.course_id,
section.sec_id, coalesce(teaches.ID, '-') as ID,
coalesce(instructor.name, '-') as name
from section full join teaches
on section.course_id = teaches.course_id
and section.sec_id = teaches.sec_id
and section.semester = teaches.semester
and section.year = teaches.year
left join instructor on teaches.ID = instructor.ID
where section.year = 2008
order by section.course_id
limit 12;
year | semester | course_id | sec_id | id | name
-----+-----+-----+-----+-----+-----
2008 | Spring   | 158       | 2      | 99052 | Dale
2008 | Fall     | 158       | 1      | 90376 | Bietzk
2008 | Spring   | 237       | 1      | 99052 | Dale
2008 | Spring   | 345       | 1      | 79081 | Ullman
2008 | Spring   | 349       | 1      | 6569  | Mingoz
2008 | Spring   | 362       | 3      | 6569  | Mingoz
2008 | Spring   | 704       | 1      | 77346 | Mahmoud
2008 | Spring   | 852       | 1      | 63287 | Jaekel
2008 | Spring   | 962       | 1      | 22591 | DAgostino
2008 | Spring   | 991       | 1      | 22591 | DAgostino
(10 rows)

universitydemo=#
```

**Query 8:** “Return all department names together with the total number of instructors in each department.”. The result set must be ordered by ascending number of instructors, and within that ordering, by ascending department name. Return no more than seven tuples. Departments that have no instructors and departments that have zero instructors must still be included in the result set.

```
select department.dept_name,
       count(instructor.ID) as num_instructors
from department left join instructor
on department.dept_name = instructor.dept_name
group by department.dept_name
order by num_instructors, dept_name
limit 7;
```

## Result:

```
shimmy@TABLET-75LA7USR: x + v
    coalesce(instructor.name, '-') as name
from section full join teaches
    on section.course_id = teaches.course_id
    and section.sec_id = teaches.sec_id
    and section.semester = teaches.semester
    and section.year = teaches.year
    left join instructor on teaches.ID = instructor.ID
where section.year = 2008
order by section.course_id
limit 12;
year | semester | course_id | sec_id | id | name
-----+-----+-----+-----+-----+-----
2008 | Spring   | 158       | 2      | 99052 | Dale
2008 | Fall     | 158       | 1      | 90376 | Bietzk
2008 | Spring   | 237       | 1      | 99052 | Dale
2008 | Spring   | 345       | 1      | 79081 | Ullman
2008 | Spring   | 349       | 1      | 6569  | Mingoz
2008 | Spring   | 362       | 3      | 6569  | Mingoz
2008 | Spring   | 704       | 1      | 77346 | Mahmoud
2008 | Spring   | 852       | 1      | 63287 | Jaekel
2008 | Spring   | 962       | 1      | 22591 | DAgostino
2008 | Spring   | 991       | 1      | 22591 | DAgostino
(10 rows)

universitydemo=# select department.dept_name, count(instructor.ID) as num_instructors
from department left join instructor on department.dept_name = instructor.dept_name
group by department.dept_name
order by num_instructors, dept_name
limit 7;
dept_name | num_instructors
-----+-----
Civil Eng. | 0
History    | 0
Math       | 0
Astronomy  | 1
Finance    | 1
Geology    | 1
Biology    | 2
(7 rows)

universitydemo=#
```