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Lab3
190905104

I am using livesql.

1) Find courses that ran in Fall 2009 or in Spring 2010

```
select course_id from section where semester='Fall' and year='2009' UNION select course_id  
from section where semester='Spring' and year='2010';
```

2) Find courses that ran in Fall 2009 and in spring2010

```
select course_id from section where semester='Fall' and year='2009' INTERSECT select  
course_id from section where semester='Spring' and year='2010';
```

3) Find courses that ran in Fall 2009 but not in Spring 2010

```
select course_id from section where semester='Fall' and year='2009' MINUS select course_id  
from section where semester='Spring' and year='2010';
```

4) Find the name of the course for which none of the students registered.

```
select course_id from course where course_id NOT IN (select course_id from takes);
```

5) Find courses offered in Fall 2009 and in Spring 2010.

```
select course_id from section where semester='Fall' and year=2009 AND course_id IN (select  
course_id from section where semester='Spring' and year=2010);
```

6) Find the total number of students who have taken course taught by the instructor with ID 10101.

```
select COUNT(UNIQUE takes.id) from takes where takes.course_id IN (select course_id from  
teaches where teaches.id='10101');
```

7) Find courses offered in Fall 2009 but not in Spring 2010.

```
SELECT s1.course_id FROM section s1 WHERE semester = 'Fall' AND year = 2009 AND  
s1.course_id NOT IN (SELECT s2.course_id FROM section s2 WHERE semester = 'Spring' and  
year = 2010);
```

8) Find the names of all students whose name is same as the instructor's name.

```
select student.name from student where student.name IN (select instructor.name from instructor);
```

9) Find names of instructors with salary greater than that of some (at least one) instructor in the Biology department.

```
select i1.name from instructor i1 where i1.salary > SOME(select i2.salary from instructor i2 where i2.dept_name='Biology');
```

10) Find the names of all instructors whose salary is greater than the salary of all instructors in the Biology department.

```
select i1.name from instructor i1 where i1.salary > ALL(select i2.salary from instructor i2 where i2.dept_name='Biology');
```

11) Find the departments that have the highest average salary.

```
select dept_name from (select dept_name, avg(salary) avg_sal from instructor group by dept_name)
where avg_sal = (select MAX(avg_sal) from (select dept_name, avg(salary) avg_sal from instructor group by dept_name));
```

12) Find the names of those departments whose budget is lesser than the average salary of all instructors.

```
select dept_name from department where budget < (select avg(salary) avg_sal from instructor);
```

13) Find all courses taught in both the Fall 2009 semester and in the Spring 2010 semester.

```
select course_id from section where semester='Fall' and year=2009 AND EXISTS(select course_id from section where semester='Spring' and year=2010);
```

14) Find all students who have taken all courses offered in the Biology department.

```
select S.ID, S.name FROM student S where NOT EXISTS((select course_id from course where dept_name = 'Biology')
MINUS(select T.course_id from takes T where S.ID = T.ID));
```

15) Find all courses that were offered at most once in 2009.

```
select course_id from (select course_id, count(*) count from section where section.year=2009 group by course_id) where count<=1;
```

16) Find all the students who have opted at least two courses offered by CSE department.

```
select name from student s where 1 < (select COUNT(t.course_id) from takes t, course c where  
t.id=s.id and t.course_id=c.course_id and c.dept_name='Comp. Sci.');
```

17) Find the average instructors salary of those departments where the average salary is greater than 42000

```
select dept_name, avg_salary from (select dept_name, AVG(salary) avg_salary from instructor  
GROUP BY dept_name) where avg_salary > 42000;
```

18) Create a view all_courses consisting of course sections offered by Physics department in the Fall 2009, with the building and room number of each section.

```
CREATE VIEW all_courses as select section.course_id, building, room_number from section,  
course where semester = 'Fall' AND year = 2009 AND section.course_id = course.course_id  
AND dept_name = 'Physics';
```

19) Select all the courses from all_courses view.

```
select course_id from all_courses;
```

20) Create a view department_total_salary consisting of department name and total salary of that department.

```
CREATE VIEW department_total_salary as select dept_name, SUM(salary) sum_sal from  
instructor GROUP BY dept_name;
```