190905514 C SECTION 4th SEM MOHAMMAD TOFIK

LAB 3 :

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

```
SELECT course_id FROM section WHERE semester = 'Fall'
AND year = 2009 UNION ALL
SELECT course_id FROM section WHERE semester = 'Spring'
and year = 2010;
```

2.) Find courses that ran in Fall 2009 and in spring 2010

```
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.title FROM course WHERE course.course_id
NOT IN (SELECT takes.course_id FROM takes);
```

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

```
SELECT s1.course_id FROM section s1 WHERE semester =
'Fall' AND year = 2009 AND s1.course_id IN (SELECT
s2.course_id FROM section s2 WHERE semester = 'Spring'
and year = 2010 );
```

6.) Find the total number of students who have taken course taught by the instructor with 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 UNIQUE 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)
avgsal FROM instructor GROUP BY dept_name) WHERE avgsal
= (SELECT MAX(avgsal) FROM (SELECT dept_name,
AVG(salary) avgsal 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 department.dept_name FROM department WHERE
department.budget < (SELECT avg(salary) avgsal FROM
instructor);
```

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

```
SELECT course_id from section S where semester = 'Fall'
and year = 2009 and exists (select * from section T
where semester = 'Spring' and year = 2010 and
S.course_id = T.course_id);
```

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

```
SELECT DISTINCT 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 id FROM (select id,count(*) count FROM takes
WHERE takes.course_id like 'CS%' group by id) WHERE
count⩾2;
```

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;
```