1.Write the following queries in SQL, using the university schema:
a.Find all courses worth more than 3 credits;
b.Find all classrooms situated either in ‘Watson’ or ‘Packard’ buildings;
c.Find all courses offered by the Computer Science department;
d.Find all courses offered during fall;
e.Find all students who have more than 45 credits but less than 90;
f.Find all students whose names end with vowels;g.Find all courses which have course ‘CS-101’ as their prerequisite;

2.Write the following queries in SQL, using the university schema:
a.For each department, find the average salary of instructors in thatdepartment and list them in ascending order. Assume that everydepartment has at least one instructor;
b.Find the building where the biggest number of courses takes place;
c.Find the department with the lowest number of courses offered;
d.Find the ID and name of each student who has taken more than 3 coursesfrom the Computer Science department;
e.Find all instructors who work either in Biology, Philosophy, or Musicdepartments;
f.Find all instructors who taught in the 2018 year but not in the 2017 year;

3.Write the following queries in SQL, using the university schema:
a.Find all students who have taken Comp. Sci. course and got an excellentgrade (i.e., A, or A-) and sort them alphabetically;
b.Find all advisors of students who got grades lower than B on any class;
c.Find all departments whose students have never gotten an F or C grade;
d.Find all instructors who have never given an A grade in any of the coursesthey taught;
e.Find all courses offered in the morning hours (i.e., courses ending before13:00);

1) a)
```
select title from course
where credits >= 3;
```
b)
```
select room_number from classroom
where building = 'Watson' or building = 'Packard';
```
c)
```
select title from course
where dept_name = 'Comp. Sci.';
```
d)
```
select title from course c, teaches t
where t.semester = 'Fall' and c.course_id = t.course_id;
```
e)
```
select name from student
where tot_cred between 45 and 90;
```
f)
```
select name from student
where name~*'[aewiuoy]$';
```
g)
```
select title from course c, prereq p
where c.course_id = p.course_id and p.prereq_id = 'CS-101';
```

2)a)
```
select dept_name, avg(salary) AS avg_salary from instructor
group by dept_name
ORDER BY avg_salary;
```

b)
```
SELECT d.building,count(1) FROM department d,course c
WHERE d.dept_name = c.dept_name
GROUP BY d.building
HAVING count(1)=(SELECT MAX(second.number) FROM
(SELECT count(1) as number FROM department,course
WHERE department.dept_name = course.dept_name
group by department.building) as second);
```

```
c) select d.dept_name, count(1) from department d, course c
where d.dept_name = c.dept_name
group by d.dept_name
having count(1) = (select min(second.number) from
(select count(1) as number from department d, course c
where d.dept_name = c.dept_name
group by d.dept_name) as second);

d) SELECT DISTINCT s.id,s.name FROM student s
WHERE s.id IN (SELECT third.id FROM
(SELECT student.id, count(1) as number
FROM student,takes,course
WHERE student.id=takes.id and takes.course_id=course.course_id
and course.dept_name='Comp. Sci.' group by student.id)as third
WHERE third.number>3);


e) select name from instructor
where dept_name = 'Philosophy' or dept_name = 'Music' or dept_name =
'Biology';


F) select distinct i.id, i.name from instructor i, teaches t
where i.id = t.id and  t.year = 2018 and
      t.id not in (select distinct i.id from instructor i, teaches t
                   where i.id = t.id and t.year = 2017);




3)a) select s.name from student s, takes t
where s.id = t.id and (t.grade = 'A' or t.grade = 'A-') and t.course_id like
'CS%'
group by s.name;

B)  select id, name from instructor
where id in (select a.i_id from advisor a, student s, takes t
    where a.s_id = s.id and t.id = s.id and
    (t.grade != 'A' and t.grade != 'A-' and t.grade != 'B+' and t.grade !=
'B' or t.grade is NULL));


C) select distinct s.dept_name from student s, takes t
where s.id = t.id and s.dept_name not in
                    (select s.dept_name from takes t, student s
                        where t.id = s.id and (grade = 'F' or grade =
'C'));


D) select id, name from instructor
where id not in (select i.id from instructor i, advisor a, takes t
    where i.id = a.i_id and a.s_id = t.id and t.grade = 'A');

select id, name from instructor
where id not in (select i.id from instructor i, teaches te, takes t
    where i.id = te.id and te.course_id = t.course_id and t.grade = 'A');


E) select distinct c.title from course c, section s, time_slot t
where c.course_id = s.course_id and s.time_slot_id = t.time_slot_id and
t.end_hr <= 13;
```