1.
```sql
drop database if exists cs336hw3;
create database cs336hw3;
use cs336hw3;

create table students(
 sid int primary key,
 name varchar(30),
 age int,
 gpa float
);

create table courses(
 cid varchar(10) primary key,
 deptid varchar(10),
 name varchar(30)
);

create table professors(
 ssn int primary key,
 name varchar(30),
 address varchar(50),
 phone varchar(15),
 deptid varchar(10)
);

create table teaches(
 cid varchar(10),
 section int,
 ssn int,
 primary key (cid, section),
 foreign key (cid) references courses(cid),
 foreign key (ssn) references professors(ssn)
);

create table enrollment(
 sid int,
 cid varchar(10),
 section int,
 grade varchar(5),
 primary key (sid,cid),
 foreign key (sid) references students(sid),
 foreign key (cid) references courses(cid),
 foreign key (cid, section) references teaches (cid, section)
);
```

```
2.
select p.name
from professors p
where deptid = 'cs';

3.
select s.sid
from students s,
        courses c,
    enrollment e
where s.sid = e.sid
        and c.cid = e.cid
        and c.deptid = 'cs';

4.
select p.ssn, p.name
from professors p,
        courses c,
        teaches t
where t.cid = c.cid
        and p.ssn = t.ssn
        and p.deptid = 'cs'
        and c.deptid <> 'cs';

5.
select c.deptid,
        count(c.cid)
from courses c
group by c.deptid;

6.
select c.deptid
from courses c
group by c.deptid
having count(c.cid) = 2;

7.
select s.name
from students s,
        enrollment e,
         teaches t,
        professors p
where s.sid = e.sid
        and e.cid = t.cid
        and e.section = t.section
        and t.ssn = p.ssn
```

```
        and p.name like 'M%';

8.
select deptid,
        sum(if(size = 'Small', students, 0)) Small,
        sum(if(size = 'Medium', students, 0)) Medium,
        sum(if(size = 'Large', students, 0)) Large
from
        (
        select size, deptid, count(*) as 'students'
        from
                (
                select c.deptid,e.cid, e.section, count(e.sid),
                if(count(e.sid)<30, 'Small',
                        if(count(e.sid)<80, 'Medium', 'Large')) size
                from
                        enrollment e,
                        courses c
                where e.cid = c.cid
                group by e.cid, e.section
                )t1
         group by size, deptid
    )t2
group by deptid;

9.
select name
from professors
where deptid = any
        (select t3.deptid
        from
                (select deptid, count(*) as 'faculty'
                from professors
                group by deptid
        )       t3,
                (select deptid,
                        sum(if(size = 'Small', students, 0)) Small,
                        sum(if(size = 'Medium', students, 0)) Medium,
                        sum(if(size = 'Large', students, 0)) Large
                from
                        (
                        select size, deptid, count(*) as 'students'
                        from
                        (
                                select c.deptid,e.cid, e.section, count(e.sid),
                                        if(count(e.sid)<30, 'Small',
```

```
                                    if(count(e.sid)<80, 'Medium', 'Large')) size
                        from
                                enrollment e,
                                courses c
                                where e.cid = c.cid
                                group by e.cid, e.section
                                )t1
                        group by size, deptid
                )t2
                group by deptid)t4
        where t4.deptid = t3.deptid
                and faculty > 20
                and t4.Large > t4.Medium + t4.Small
);
```

10.
```
select cid, section, (count(if(grade = 'D' or grade = 'F', 1, Null))*100.0/count(grade))
as failpercentage
from enrollment
group by cid, section;
```

11.
```
select p.name
from teaches t,
        professors p,
        (select cid, section, max(failpercentage)
        from
                (select cid, section, (count(if(grade = 'D' or grade = 'F', 1,
Null))*100.0/count(grade)) as failpercentage
                from enrollment
                group by cid, section
                )t1
        )t2
where t.ssn = p.ssn
and t.cid = t2.cid
and t.section = t2.section;
```

12.
**//For this question, I am not sure what u asking me.
Because it is similar to question 10. I assume u mean
course (including all session)**
```
select cid, (count(if(grade = 'D' or grade = 'F', 1, Null))*100.0/count(grade)) as
failpercentage
                from enrollment
                group by cid
```

13.
```
select t3.section
from
                (select cid, (count(if(grade = 'D' or grade = 'F', 1,
Null))*100.0/count(grade)) as failpercentage
                from enrollment
                group by cid
                )t1,
        (select cid, section,(count(if(grade = 'D' or grade = 'F', 1,
Null))*100.0/count(grade)) as failpercentage
                from enrollment
                group by cid, section
        )t3
where t1.cid = t3.cid
and t3.failpercentage > t1.failpercentage;
```

14.

```
select c.deptid,
        sum (if (select avg(e.sid)
                from enrollment e,
                    courses c,
                where c.cid = e.cid
                and count(e.grade = 'A')*100/count(e.grade)
        ))SPS,
        sum(if e.grade == 'A', enrollment, 0) %A,
        sum(if e.grade == 'B', enrollment, 0) %B,
        sum(if e.grade == 'C', enrollment, 0) %C,
        sum(if e.grade == 'D', enrollment, 0) %D,
        sum(if e.grade == 'F', enrollment, 0) %F
from
        courses c,
group by c.deptid;
```