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Section 1B

Homework 2

1.

a.
```
select person-name
from Work
where salary > 20000
```

b. $\pi_{person-name}(\sigma_{salary>20000}Work)$

c. The results are not the same since there are duplicates in the SQL query.

2.

a.
```
select person-name
from Work
group by person-name
having sum(salary) > (select max sum(salary)
                      from Work, Employee
                      where Work.person-name=Employee.person-name
                      and city = 'Los Angeles'
                      group by Work.person-name)

select person-name
from Employee A
where not exists (select Work.person-name
                  from Work, Employee
                  where Work.person-name=Employee.person-name
                  and city = 'Los Angeles'
                  group by Work.person-name
                  having sum(salary) > (select sum(salary)
                                        from Work
                                        where person-name=A.person-name
```

b.

```
select manager-name
from Manage M
where exists (select person-name
                from Manage M2
                where M.manager-name=M2.manager-name
                and (select sum(salary)
                        from Work
                        where Work.person-name=M2.manager-name
                        group by Work.person-name)
                        >
                        (select sum(salary)
                        from Work
                        where Work.person-name=M2.person-name
                        group by Work.person-name)
```

```
select manager-name
from Manage M
where (select sum(salary)
        from Work
        where Work.person-name=M.manager-name
        group by Work.person-name)
        >
        some (select sum(salary)
                from Work
                where Work.person-name=M.person-name
                group by Work.person-name)
```

3.

a.i.

```
select name, address
from MovieStar
where gender = 'F'
intersect
select name, address
from MovieExec
where netWorth > 1000000
```

a.ii.

```
select name, address
from MovieStar
where gender = 'F'
and name,address in (select name, address
                        from MovieExec
                        where netWorth > 1000000)
```

b.i.
```
select name
from MovieStar
except
select name
from MovieExec
```

b.ii.
```
select name
from MovieStar
where name not in (select name
                   from MovieExec)
```

4.

a.
```
select avg(speed)
from Desktop
```

b.
```
select avg(price)
from Laptop, ComputerProduct
where weight<2
and Laptop.model=ComputerProduct.model
```

c.
```
select avg(price)
from ComputerProduct
where manufacturer='Dell'
```

d.
```
select avg(price)
from ComputerProduct, Laptop
where Laptop.model=ComputerProduct.model
group by Laptop.speed
```

e.
```
select manufacturer
from ComputerProduct
group by manufacturer
having count(model)>2
```

5. a.
```
insert into Desktop
values(1200, '1.2Ghz', '256MB', '80GB')

insert into ComputerProduct
values('HP', 1200, 1000)
```

b.
```
delete from Desktop
where model in (select model
                from ComputerProduct
                where price<1000
                and manufacturer='IBM')

delete from ComputerProduct
where price<1000
and manufacturer-'IBM'
and model not in (select model
                  from Laptop)
```

c.
```
update Laptop
set weight=weight+1
where model in (select model
                from ComputerProduct
                where manufacturer='Gateway')
```

6.

a.
```
select Student.name
from Student, Enroll
where Student.sid=Enroll.sid
and Enroll.dept = 'CS'
and Student.sid not in (select sid
                        from Enroll
                        where dept != 'CS')
```

b.
```
select name
from Student
where sid in (select sid
              from Enroll
              group by sid
              having count(sid) = (select count(cnum)
                                   from Class
                                   where dept = 'CS')
              where dept='CS')
```

c. I already used count in the second query to count the number of cs classes and count if students took the same number of cs classes.