employee (*ID*, *person_name, street, city*)
company (*company_name, city*)
works (ID, *company_name, salary*)
manages (ID, manager_id)

Figure 1

Consider the database in Figure 1, where the primary keys are underlined. The *manages* relation describes the manger (manager_id) of a certain employee (ID). Each manager is also an employee himself (herself). Construct the following SQL queries for this relational database.

字串用雙引號整份扣 1 分

1. Find the ID, name and manager of each employee who works for "FirstBank".

```
select ID, person_name, manager_id
from employee, works, manages
where employee.ID = works.ID and works.ID = manages.ID
      and company_name = 'FirstBank';
```

select錯扣2分，from錯扣2分，where錯扣2~5分

2. Find the ID of each employee who does not work for "FirstBank".

```
select ID
from works
where company_name <> 'FirstBank';
```

select 錯扣2分，from錯扣4分，where錯扣2-4分

3. Find the ID and name of each employee who lives in the same city as the location of the company for which the employee works.

```
select employee.ID, person_name
from employee, works, company
where employee.ID = works.ID
      and works.company_name = company. company_name
      and employee.city = company.city;
```

select錯扣2分，from錯扣3分，where錯扣5分(限制錯漏各-2)

4. Find the ID of each employee who earns more than at least one employee of "SmallBank".

(1) Please use "tuple variable".

```
select T.ID
from works as T, works as S
where T.salary > S.salary and S.company_name = 'SmallBank';
```

select錯扣 1-2 分，from錯扣2-4分，where錯扣2-4分

(2) Please use “nested subquery” in the WHERE clause.

解法1:

```
select ID
from works
where salary > some(select salary
                    from works
                    where company_name = 'SmallBank' );
```

解法2:

```
select ID
from works
where salary > (select min(salary)
                from works
                where company_name = 'SmallBank');
```

解法1: select 錯扣 1-2 分，from錯扣1-2分，where錯扣2-6分(子句扣4分)
(未加some.扣2分)

解法2: select 錯扣 1-2 分，from錯扣1-2分，where錯扣2-6分(子句扣4分)

5. Find the name of each company whose employees earn a higher salary, on average, than the average salary at “FirstBank”.

(1) Please use “having”

```
select company_name
from works
group by company_name
having avg(salary) > (select avg(salary)
                      from works
                      where company_name = ‘FirstBank’);
```

select錯扣1分，from錯扣1分，group by錯扣3分，having錯扣2~5分

(2) Please use “with”.

解法1:

```
with company_avg ( company_name, value ) as
     ( select company_name, avg( salary )
       from works
     group by company_name)
  select company_name
  from company_avg
  where value > ( select value
                  from company_avg
                  where company_name = ‘FirstBank’ ) ;
```

解法2:

```
with FirstBank_avg(salary) as
        (select avg(salary)
        from works
        where company_name = 'FirstBank'),
    All_avg(company_name, salary) as
        (select company_name, avg(salary)
        from works
        group by company_name)
    where All_avg.salary > FirstBank_avg.salary;
```

解法1: With錯扣1~5分(未group 扣2分)，select錯扣1分，from錯扣1分，where錯扣3分(where having使用錯誤 扣2分)

解法2: With錯扣1~5分，select錯扣1分，from錯扣1分，where錯扣3分(where having使用錯誤 扣2分)

6. Delete all tuples in the *works* relation for employees of "SmallBank".

```
delete from works
where company_name = 'SmallBank' ;
```

delete from 錯扣5分，where錯扣5分

7. Add a new employee with the ID as "E01" and the name as "John", but the address is currently unknown.

```
insert into employee values ('E01', 'John', null, null);
```

insert into錯扣4分，values錯扣1~6分

8. Give each employee of "FirstBank" a 10-percent raise of salaries unless the salary becomes greater than $100000; in such cases, give only a 3-percent raise.

解法1:

```
update works
   set salary = case
                   when salary * 1.1 <= 100000 then salary * 1.1
                   else salary * 1.03
                end
   where company_name = 'FirstBank';
```

解法2:

```
update works
 set salary = salary * 1.03
   where company_name = 'FirstBank' and salary*1.1 > 100000;

update works
```

```
set salary = salary * 1.1
    where company_name = 'FirstBank' and salary*1.1 <= 100000;
```

update 錯扣 2 分，set的case錯扣1-6分，where錯扣2分

Note:

1. Please submit your homework in a single PDF file to Tronclass before 2023/10/25 23:59 (星期三)

2. We do NOT accept late submission for this homework.