数据库概论作业 2

23.10.16

1

(a)

```sql
select ID, person_name, city
from employee natural join works
where company_name = 'First Bank Corporation'
```

(b)

```sql
select ID, person_name, city
from employee natural join works
where company_name = 'First Bank Corporation' and salary > 10000
```

(c)

```sql
select ID
from works
where company_name != 'First Bank Corporation'
```

(d)

```sql
select ID
from works
where salary >all (
    select salary
    from works
    where company_name = 'Small Bank Corporation'
)
```

这里假定了每位雇员只为一家公司工作, 否则题意并不清晰.

(e)

```sql
select company_name
from company
where city in (
    select city
    from works
    where company_name = 'Small Bank Corporation'
)
```

(f)

```sql
select company_name
from (
    select company_name, count(*) as num
    from works
    group by company_name
) as temp
where num = (
    select max(num)
    from temp
)
```

(g)

```sql
select company_name
from (
    select company_name, avg(salary) as avg_salary
    from works
    group by company_name
) as temp
where avg_salary > (
    select avg_salary
    from temp
    where company_name = 'First Bank Corporation'
)
```

2

(a)

```sql
update employee
set city = 'Newtown'
where ID = 12345
```

我这里把 `Newtown` 当作一个城市名, 题目并没有说清.

(b)

```sql
update works
set salary = case
    when salary <= 100000 then salary * 1.1
    else salary * 1.03
end
where company_name = 'First Bank Corporation'
    and ID in (
        select manager_id
        from manages
    )
```

3

(a)

```sql
select ID, person_name
from employee natural join works natural join company
```

(b)

```sql
select ID, person_name
from employee
    natural join employee as manager(manager_id, manager_name, street, city)
    natural join manages
```

(c)

```sql
select ID, person_name
from works
where salary > (
    select avg(salary)
    from works as w
    where w.company_name = works.company_name
)
```

(d)

```sql
select company_name
from (
    select company_name, sum(salary) as sum_salary
    from works
    group by company_name
) as temp
where sum_salary = (
    select min(sum_salary)
    from temp
)
```

4

(a)

```sql
update works
set salary = salary * 1.1
where company_name = 'First Bank Corporation'
```

(b)

```sql
update works
set salary = salary * 1.1
where company_name = 'First Bank Corporation'
    and ID in (
        select manager_id
        from manages
    )
```

(c)

```sql
delete from works
where company_name = 'Small Bank Corporation'
```

5

```sql
select dept_name
from (
    select dept_name, sum(salary) as sum_salary
    from instructor
    group by dept_name
) as temp
where sum_salary >= (
    select avg(sum_salary)
    from temp
)
```

6

(a)

```sql
select distinct A
from r
```

(b)

```sql
select *
from r
where B = 17
```

(c)

```sql
select *
from r, s
```

(d)

```sql
select distinct A, F
from r, s
where C = D
```

7

为了方便在代码块中展示, 我将用 r1 和 r2 代替原题中的 r_1 和 r_2.

(a)

```sql
select distinct A
from r1
```

(b)

```sql
select *
from r1
where B = 17
```

(c)

```sql
(select * from r1) union (select * from r2)
```

(d)

```sql
(select * from r1) intersect (select * from r2)
```

(e)

```sql
(select * from r1) except (select * from r2)
```

(f)

```sql
select distinct *
from (select A, B from r1) natural join (select B, C from r2)
```

8

(a)

```sql
select distinct A
from r
where B = 7
```

(b)

```sql
select *
from r natural join s
```

(c)

```sql
(select A from s) intersect (
    select r1.A as A
    from r as r1 join r as r2 on r1.B > r2.B
)
```