3.10

- **a.**

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

- **b.**

```sql
update works T
set T.salary = T.salary *
        case
            when T.salary * 1.1 > 100000 then 1.03 else 1.1
        end
where T.ID in (select manager_id from manages)
      and T.company_name = 'First Bank Corporation'
```

3.23

```sql
select dept_name
from (
    select dept_name, sum(salary) as value
    from instructor
    group by dept_name
) as dept_total
where dept_total.value >= (
    select avg(v)
    from (
        select sum(salary) as v
        from instructor
        group by dept_name
    )
)
```

4.3

- **a.**

```SQL
/* 使用left join */
select * from student s left join takes t on s.id = t.id

/*
 使用union和natural join,
 其中表的内容来自教材
*/
select * from student natural join takes
union
select ID, name, dept_name, tot_cred, null, null, null, null, null
from student S where not exists(
    select ID from take T where T.id = S.id)
```

- **b.**

```SQL
/* 使用left join + right join */
select * from student s
left join takes t on s.id = t.id
union
select * from student s
right join takes t on s.id = t.id

/*
 使用union和natural join,
 其中表的内容来自教材
*/
select * from student natural join takes
union
select ID, name, dept_name, tot_cred, null, null, null, null, null
from student S where not exists(
    select ID from takes T where T.id = S.id)
union
select ID, null, null, null, course_id, sec_id, semester, year, grade
from takes T where not exists(
    select ID from student S where T.id = S.id)
```

4.9

当 `manager` 表中的一个元组被删除时，所有该经理的员工元组（无论是直接员工还是间接员工）都会被删除。这个过程是分步骤进行的。初始的删除将触发删除所有直接员工对应的元组。这些删除将进一步导致删除第二层员工元组，以此类推，直到所有直接和间接员工的元组都被删除。

4.15

```SQL
select * from section inner join classroom using(building, room_number)
```

4.20

```SQL
create view tot_credits(year,num_credits) as
select year, sum(credits)
from takes natural join course
group by year
```