Exercises

• 3.8 3.9 3.10 3.15 3.16 3.17 3.21

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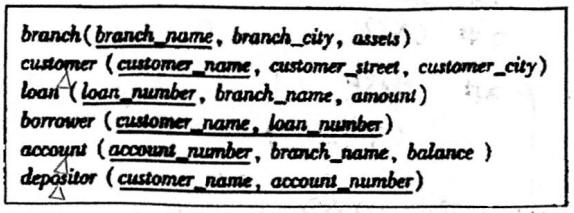

图 3-19 习题 3.8 和习题 3.15 的银行数据库

3.8 考虑图 3-19 中的银行数据库，其中加下划线的是主码。为这个关系数据库构造出如下 SQL 查询：

a. 找出银行中所有有账户但无贷款的客户。

b. 找出与"Smith"居住在同一个城市，同一个街道的所有客户的名字。

c. 找出所有支行的名称，在这些支行中都有居住在"Harrison"的客户所开设的账户。

答：a.
```
(select customer_name from depositor)
except
(select customer_name from borrower)
```

b.
```
select S.customer_name
from customer as T, join customer as S using(customer_street, customer_city)
where T.customer_name = "Smith"
```

c.
```
select distinct branch_name
from account natural join depositor natural join customer
where customer_city = "Harrison".
```

3.15 考虑图 3-19 中的银行数据库，其中加下划线的是主码。为这个关系数据库构造出如下 SQL 查询：

a. 找出在"Brooklyn"的所有支行都有账户的所有客户。

b. 找出银行的所有贷款额的总和。

c. 找出总资产至少比位于 Brooklyn 的某一家支行要多的所有支行名字。

答：a.
```
select S.customer_name
from customer as S
where no exists ((select branch_name
                  from branch
                  where branch_city = "Brooklyn")
                 except
                 (select T.branch_name
                  from account natural join depositor as T
                  where T.customer_name = S.customer_name))
```

b.
```
select sum(amount)
from loan
```

c.
```
select branch_name
from branch
where assents > some (select assets
                      from branch
                      where branch_city = "Brooklyn")
```

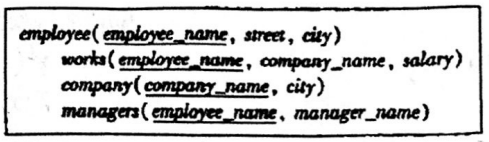

图 3-20　习题 3.9、习题 3.10、习题 3.16、习题 3.17 和习题 3.20 的雇员数据库

3.9　考虑图 3-20 的雇员数据库，其中加下划线的是主码。为下面每个查询写出 SQL 表达式：

a. 找出所有为"First Bank Corporation"工作的雇员名字及其居住城市。

b. 找出所有为"First Bank Corporation"工作且薪金超过 10 000 美元的雇员名字、居住街道和城市。

c. 找出数据库中所有不为"First Bank Corporation"工作的雇员。

d. 找出数据库中工资高于"Small Bank Corporation"的每个雇员的所有雇员。

e. 假设一个公司可以在好几个城市有分部。找出位于"Small Bank Corporation"所有所在城市的所有公司。

f. 找出雇员最多的公司。

g. 找出平均工资高于"First Bank Corporation"平均工资的那些公司。

答：ⓐ.
```
select employee_name, ~~city~~ works.city
from employee natural join ~~city~~ works
where company_name = "First Bank Corporation"
```

ⓑ
```
select employee_name, street, city
from employee natural join works
where company_name = "First Bank Corporation" and salary > 10000
```

ⓒ
```
select employee_name
from works
where company_name ≠ "First Bank Corporation"
```

ⓓ
```
select employee_name
from works
where salary > all (select salary
                    from works
                    where company_name = "Small Bank Corporation")
```

ⓔ
```
select S.company_name
from company as S
where not exists ((select city
                   from company
                   where company_name
                   = "Small Bank Corporation")
                  except
                  (select city
                   from company as T
                   where T.company_name =
                   S.company_name))
```

ⓕ
```
select company_name
from works
group by company_name
having count (distinct
    employee_name) >= all
(select count (distinct
    employee_name)
from works
group by company_name)
```

ⓖ
```
select company_name
from works
group by company_name
having avg(salary) > (select avg(salary)
                      from works
                      where company_name =
                      "First Bank Corporation")
```

3.10　考虑图 3-20 的关系数据库，给出下面每个查询的 SQL 表达式：

a. 修改数据库使"Jones"现在居住在"Newtown"市。

b. 为"First Bank Corporation"所有工资不超过 100 000 美元的经理增长 10%的工资，对工资超过 100 000 美元的只增长 3%。

答：a.
```
update employee
set city = "Newton"
where person_name = "Jones"
```

b.
```
update works
set ~~case~~ salary = case
    when salary <= 100 000 then salary * 1.1
    else salary * 1.03
where company_name = "First Bank Corporation" and
    employee_name in (select manager_name
                      from manages)
```

3.16 考虑图 3-20 中的雇员数据库，其中加下划线的是主码。给出下面每个查询对应的 SQL 表达式：

a. 找出所有为“First Bank Corporation”工作的雇员名字。

b. 找出数据库中所有居住城市和公司所在城市相同的雇员。

c. 找出数据库中所有居住的街道和城市与其经理相同的雇员。

d. 找出工资高于其所在公司雇员平均工资的所有雇员。

e. 找出工资总和最小的公司。

答：a. select employee-name
from works
where company_name = "First Bank Corporation"

b. select employee_name
from employee natural join works natural join company

c. select P.employee_name
from employee as P, employee as R, manages as M
where P.employee_name = M.employee_name and
R.employee_name = M.manager_name and
P.street = R.street and P.city = R.city

d. select employee_name
from works T
where salary > (select avg(salary)
from works S
where T.company_name
= S.company_name).

e. select company_name
from works
group by company_name
having sum(salary) <= all
(select sum(salary)
from works
group by company_name)

3.17 考虑图 3-20 中的关系数据库。给出下面每个查询对应的 SQL 表达式：

a. 为“First Bank Corporation”的所有雇员增长 10% 的工资。

b. 为“First Bank Corporation”的所有经理增长 10% 的工资。

c. 删除“Small Bank Corporation”的雇员在 *works* 关系中的所有元组。

答：a. update works
set salary = salary * 1.1
where company_name = "First Bank Corporation"

b. update works
set salary = salary * 1.1
where employee_name in (select manager_name
from manages)
and company_name = "First Bank Corporation"

c. delete from works
where company_name = "Small
Bank Corporation"

3.21 考虑图 3-21 中的图书馆数据库。用 SQL 写出如下查询：

a. 打印借阅了任意由“McGraw-Hill”出版的书的会员名字。

b. 打印借阅了所有由“McGraw-Hill”出版的书的会员名字。

c. 对于每个出版商，打印借阅了多于五本由该出版商出版的书的会员名字。

d. 打印每位会员借阅书籍数量的平均值。考虑这样的情况：如果某会员没有借阅任何书籍，那么该会员根本不会出现在 *borrowed* 关系中。

答：a: select name
from member natural join book natural join borrowed
where publisher = "McGraw-Hill"

b: select distinct m.name
from member as m
where not exists ((select isbn
from book
where publisher = "McGraw-Hill")
except
(select isbn
from borrowed as l
where l.memb_no = m.memb_no))

member(memb_no, name, age)
book(isbn, title, authors, publisher)
borrowed(memb_no, isbn, date)

图 3-21 习题 3.21 的图书馆数据库

c. select publisher, name
from member natural join
book natural join borrowed
group by publisher, memb_no
having count (isbn) > 5

d. with memcount as
(select count(*)
from member)
select count(*) / memcount
from borrowed