3.15 Consider the bank database of Figure 3.19, where the primary keys are underlined. Construct the following SQL queries for this relational database.

   a. Find all customers who have an account at *all* the branches located in “Brooklyn”.

   b. Find out the total sum of all loan amounts in the bank.

   c. Find the names of all branches that have assets greater than those of at least one branch located in “Brooklyn”.

**Answer:**

   a. SQL query:
with branchcount as
  (select count(*)
   from branch
   where branch_city = 'Brooklyn')
select customer_name
from customer c
where branchcount =
  (select count(distinct branch_name)
   from (customer natural join depositor natural join account
       natural join branch) as d
   where d.customer_name = c.customer_name)

There are other ways of writing this query, for example by first
finding customers who do not have an account at some branch in
Brooklyn, and then removing these customers from the set of all
customers by using an except clause.

b. SQL query:

   select sum(amount)
   from loan

c. SQL query:

   select branch_name
   from branch
   where assets > some
     (select assets
      from branch
      where branch_city = 'Brooklyn')

The keyword any could be used in place of some above.

3.16 Consider the employee database of Figure 3.20, where the primary keys
are underlined. Give an expression in SQL for each of the following
queries.

   a. Find the names of all employees who work for First Bank Corpo-
      ration.
   b. Find all employees in the database who live in the same cities as
      the companies for which they work.
   c. Find all employees in the database who live in the same cities and
      on the same streets as do their managers.
   d. Find all employees who earn more than the average salary of all
      employees of their company.
e. Find the company that has the smallest payroll.

Answer:

a. Find the names of all employees who work for First Bank Corporation.

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

b. Find all employees in the database who live in the same cities as the companies for which they work.

```sql
select e.employee_name
from employee e, works w, company c
where e.employee_name = w.employee_name and e.city = c.city and
w.company_name = c.company_name
```

c. Find all employees in the database who live in the same cities and on the same streets as do their managers.

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

d. Find all employees who earn more than the average salary of all employees of their company.

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

The primary key constraint on `works` ensures that each person works for at most one company.

e. Find the company that has the smallest payroll.

```sql
select company_name
from works
group by company_name
having sum(salary) <= all (select sum(salary)
                           from works
                           group by company_name)
```