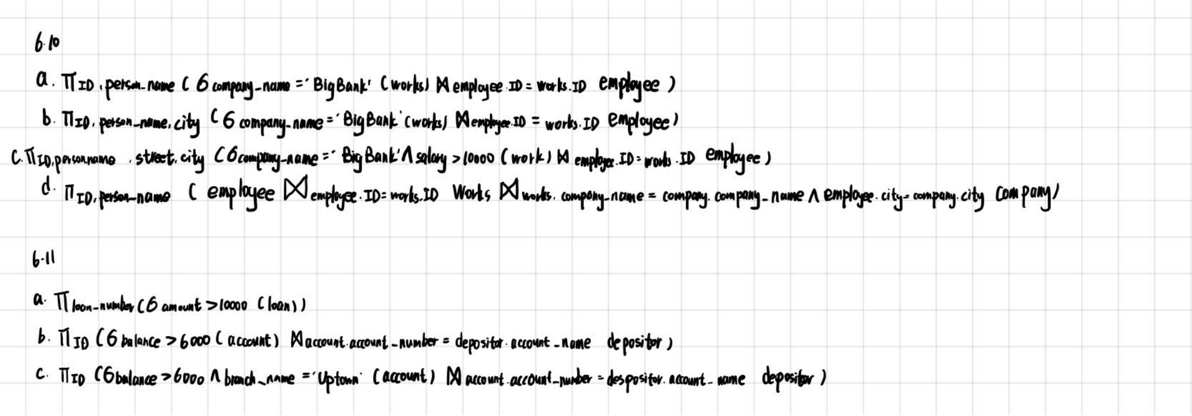
> 2127405048 方浩楠

6.10

> Consider the employee database of Figure 2.17. Give an expression in the relational algebra to express each of the following queries:
> a. Find the ID and name of each employee who works for "BigBank".
> b. Find the ID, name, and city of residence of each employee who works for "BigBank".
> c. Find the ID, name, street address, and city of residence of each employee who works for "BigBank" and earns more than $10000.
> d. Find the ID and name of each employee in this database who lives in the same city as the company for which she or he works.

6.11

> Consider the bank database of Figure 2.18. Give an expression in the relational algebra for each of the following queries:
>
> a. Find each loan number with a loan amount greater than $10000.
> b. Find the ID of each depositor who has an account with a balance greater than $6000.
> c. Find the ID of each depositor who has an account with a balance greater than $6000 at the "Uptown" branch.



6.10

a. $\Pi_{ID,\ person\_name}(\sigma_{company\_name='BigBank'}(works) \bowtie_{employee.ID=works.ID} employee)$

b. $\Pi_{ID,\ person\_name,\ city}(\sigma_{company\_name='BigBank'}(works) \bowtie_{employee.ID=works.ID} employee)$

c. $\Pi_{ID,\ personname,\ street,\ city}(\sigma_{company\_name='BigBank' \wedge salary>10000}(work) \bowtie_{employee.ID=works.ID} employee)$

d. $\Pi_{ID,\ person\_name}(employee \bowtie_{employee.ID=works.ID} Works \bowtie_{works.company\_name=company.company\_name \wedge employee.city=company.city} company)$

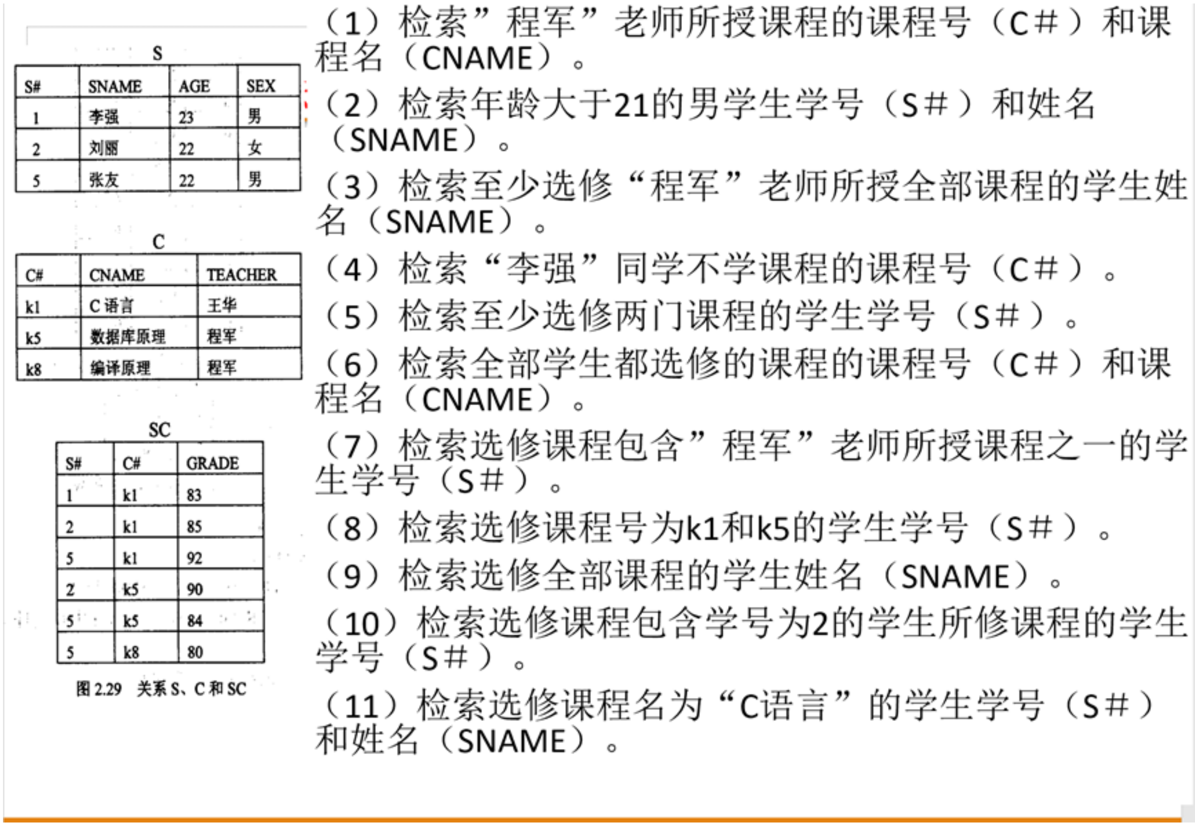
6.11

a. $\Pi_{loan\_number}(\sigma_{amount>10000}(loan))$

b. $\Pi_{ID}(\sigma_{balance>6000}(account) \bowtie_{account.account\_number=depositor.account\_name} depositor)$

c. $\Pi_{ID}(\sigma_{balance>6000 \wedge branch\_name='Uptown'}(account) \bowtie_{account.account\_number=despositor.account\_name} depositor)$

关系代数操作



S

S#	SNAME	AGE	SEX
1	李强	23	男
2	刘丽	22	女
5	张友	22	男

C

C#	CNAME	TEACHER
k1	C 语言	王华
k5	数据库原理	程军
k8	编译原理	程军

SC

S#	C#	GRADE
1	k1	83
2	k1	85
5	k1	92
2	k5	90
5	k5	84
5	k8	80

图 2.29　关系 S、C 和 SC

（1）检索”程军”老师所授课程的课程号（C＃）和课程名（CNAME）。

（2）检索年龄大于21的男学生学号（S＃）和姓名（SNAME）。

（3）检索至少选修“程军”老师所授全部课程的学生姓名（SNAME）。

（4）检索“李强”同学不学课程的课程号（C＃）。

（5）检索至少选修两门课程的学生学号（S＃）。

（6）检索全部学生都选修的课程的课程号（C＃）和课程名（CNAME）。

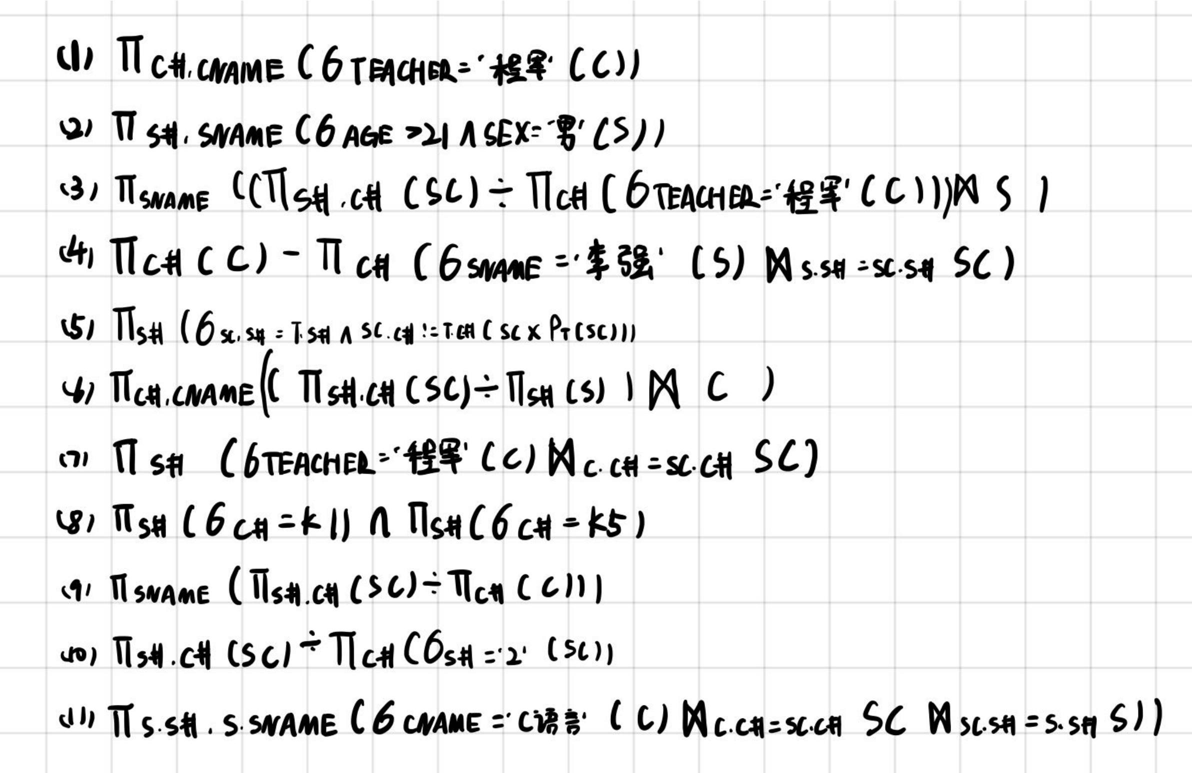
（7）检索选修课程包含”程军”老师所授课程之一的学生学号（S＃）。

（8）检索选修课程号为k1和k5的学生学号（S＃）。

（9）检索选修全部课程的学生姓名（SNAME）。

（10）检索选修课程包含学号为2的学生所修课程的学生学号（S＃）。

（11）检索选修课程名为“C语言”的学生学号（S＃）和姓名（SNAME）。



(1) $\Pi_{C\#,CNAME}(\sigma_{TEACHER=\text{'程军'}}(C))$

(2) $\Pi_{S\#,SNAME}(\sigma_{AGE>21 \land SEX=\text{'男'}}(S))$

(3) $\Pi_{SNAME}((\Pi_{S\#,C\#}(SC) \div \Pi_{C\#}(\sigma_{TEACHER=\text{'程军'}}(C)))\bowtie S)$

(4) $\Pi_{C\#}(C) - \Pi_{C\#}(\sigma_{SNAME=\text{'李强'}}(S) \bowtie_{S.S\#=SC.S\#} SC)$

(5) $\Pi_{S\#}(\sigma_{SC.S\#=T.S\# \land SC.C\# != T.C\#}(SC \times \rho_T(SC)))$

(6) $\Pi_{C\#,CNAME}((\Pi_{S\#,C\#}(SC) \div \Pi_{S\#}(S)) \bowtie C)$

(7) $\Pi_{S\#}(\sigma_{TEACHER=\text{'程军'}}(C) \bowtie_{C.C\#=SC.C\#} SC)$

(8) $\Pi_{S\#}(\sigma_{C\#=k1}) \cap \Pi_{S\#}(\sigma_{C\#=k5})$

(9) $\Pi_{SNAME}(\Pi_{S\#,C\#}(SC) \div \Pi_{C\#}(C)))$

(10) $\Pi_{S\#,C\#}(SC) \div \Pi_{C\#}(\sigma_{S\#=\text{'2'}}(SC))$

(11) $\Pi_{S.S\#,S.SNAME}(\sigma_{CNAME=\text{'C语言'}}(C) \bowtie_{C.C\#=SC.C\#} SC \bowtie_{SC.S\#=S.S\#} S))$