数据库系统原理第一次作业

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2.6 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 name of each employee who lives in city “Miami”.

b. Find the name of each employee whose salary is greater than $100000.

c. Find the name of each employee who lives in “Miami” and whose salary is greater than $100000.

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employee (person name, street, city)
works (person name, company name, salary)
company (company name, city)

Figure 2.17 Employee Database.

Solution:

a. $\Pi_{person\ name}(\sigma_{city="Miami"}(employee))$

b. $\Pi_{person\ name}(\sigma_{salary>100000}(employee \bowtie works))$

c. $\Pi_{person\ name}(\sigma_{city="Miami" \wedge\ salary>100000}(employee \bowtie works))$

2.7 Consider the bank database of Figure 2.18. Give an expression in the relational algebra for each of the following queries:

a. Find the name of each branch located in “Chicago”.

b. Find the ID of each borrower who has a loan in branch “Downtown”

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branch(branch name, branch city, assets)
customer (ID, customer name, customer street, customer city)
loan (loan number, branch name, amount)
borrower (ID, loan number)
account (account number, branch name, balance)
depositor (ID, account number)

Figure 2.18 Bank Database.

Solution:

a. $\Pi_{branch\ name}(\sigma_{branch\ city="Chicago"}(branch))$

b. $\Pi_{\mathrm{ID}}(\sigma_{branch\ name="Chicago"}(borrower \bowtie loan))$

2.15 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.

Solution:

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

b. $\Pi_{ID}(\sigma_{balance>6000}(depositor \bowtie account))$

c. $\Pi_{ID}(\sigma_{balance>6000 \wedge branch\ name="Uptown"}(depositor \bowtie account))$