

Lecture 4中最後面的Exercise的參考答案(答案不是唯一的)：

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

$\Pi_{\text{person-name}} (\sigma_{\text{company-name}='First Bank Corporation'} \text{ works})$

(b) Find the names and cities of residence of all employees who work for First Bank Corporation.

$\Pi_{\text{person-name,city}} ((\sigma_{\text{company-name}='First Bank Corporation'} \text{ works}) \bowtie \text{employee})$

(c) Find the names, street address, and cities of residence of all employees who work for First Bank and earn more than \$10,000 per annum.

$\Pi_{\text{person-name,street,city}} ((\sigma_{\text{company-name}='First Bank Corporation' \text{ and salary}>10000} \text{ works}) \bowtie \text{employee})$

(d) Find the names of all employees in this database who live in the same city as the company locates for which they work.

$P(\text{temp1}(\text{city} \rightarrow \text{city1}), \text{employee} \bowtie \text{works})$

$\Pi_{\text{person-name}} (\sigma_{\text{city1}=\text{city}} (\text{temp1} \bowtie \text{company}))$

(e) Find the names of all employees who live in the same city and on the same street as do their managers.

$P(\text{temp1}(\text{person-name} \rightarrow \text{p1}, \text{street} \rightarrow \text{s1}, \text{city} \rightarrow \text{c1}), \text{employee} \bowtie \text{manages})$

$P(\text{temp2}(\text{person-name} \rightarrow \text{p2}, \text{street} \rightarrow \text{s2}, \text{city} \rightarrow \text{c2}), \text{employee})$

$\Pi_{\text{p1}} (\text{temp1} \bowtie_{\text{manager-name}=\text{p2} \text{ and } \text{s1}=\text{s2} \text{ and } \text{c1}=\text{c2}} \text{temp2})$

(f) Find the names of all employees in this database who do not work for the First Bank Corporation.

$\Pi_{\text{person-name}}(\text{employee}) - \Pi_{\text{person-name}} (\sigma_{\text{company-name}='First Bank Corporation'} \text{ works})$

(g) Find the names of all employees who earn more than every employee of Small Bank Corporation.

$P(\text{temp1}(1 \rightarrow \text{p1}, 2 \rightarrow \text{s1}), \Pi_{\text{person-name,salary}}(\text{employee} \bowtie (\sigma_{\text{company-name} \neq 'Small Bank Corporation'} \text{ works})))$

$P(\text{temp2}(1 \rightarrow \text{p2}, 2 \rightarrow \text{s2}), \Pi_{\text{person-name,salary}}(\text{employee} \bowtie (\sigma_{\text{company-name}='Small Bank Corporation'} \text{ works})))$

$\Pi_{\text{p1}} (\text{temp1}) - \Pi_{\text{p1}} (\text{temp1} \bowtie_{\text{s1} < \text{s2}} \text{temp2})$

(h) Assume the companies may be located in several cities. Find all companies located in every city in which Small Bank Corporation is

located.

company/ $\Pi_{city}(\sigma_{company-name='Small Bank Corporation'} company)$

(i) Find the names of employees who work for more than 3 (included) companies.

$P(temp1, \Pi_{person-name, company-name}(works))$

$P(temp2(1 \rightarrow p1, 2 \rightarrow c1, 3 \rightarrow p2, 4 \rightarrow c2, 5 \rightarrow p3, 6 \rightarrow c3), temp1 \times temp1 \times temp1)$

$\Pi_{p1} (\sigma_{p1=p2=p3 \text{ and } c1 \neq c2 \text{ and } c2 \neq c3 \text{ and } c1 \neq c3}(temp2))$