Lab Work 1

employee (person_name, street, city)

works (person_name, company_name, salary)

company (company_name, city)

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1.1 Find the ID and name of each employee who works for "BigBank".

$\prod_{\text{id, person\_name}}(\sigma_{\text{company\_name="BigBank"}}(\text{employee} \bowtie_{\text{employee.person\_name=works.person\_name}} \text{works}))$

1.2 Find the ID, name, and city of residence of each employee who works for "BigBank".

$\prod_{\text{id, person\_name, city}}(\sigma_{\text{company\_name="BigBank"}}(\text{employee} \bowtie_{\text{employee.person\_name=works.person\_name}} \text{works}))$

1.3 Find the ID, name, street address, and city of residence of each employee who works for "BigBank" and earns more than $10000.

$\prod_{\text{id, person\_name, street, city}}(\sigma_{\text{company\_name="BigBank"} \wedge \text{salary} > 10\,000}(\text{employee} \bowtie_{\text{employee.person\_name=works.person\_name}} \text{works}))$

1.4 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.

$\prod_{\text{id, person\_name}}(\sigma_{\text{employee.city=company.city}}(\text{employee} \bowtie_{\text{employee.person\_name=works.person\_name}} \text{works}$

$\bowtie_{\text{works.company\_name=company.company\_name}} \text{company}))$

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2.1 Find the ID and name of each employee who does not work for "BigBank".

$\prod_{\text{id, person\_name}}(\sigma_{\text{company\_name} \neq \text{"BigBank"}}(\text{employee} \bowtie_{\text{employee.person\_name=works.person\_name}} \text{works}))$

2.2 Find the ID and name of each employee who earns at least as much as every employee in the database.

$\prod_{\text{id, person\_name}}(\sigma_{\text{salary} \geq \text{avg(salary)}}(\text{employee} \bowtie_{\text{employee.person\_name=works.person\_name}} \text{works}))$

Consider the foreign-key constraint from the dept_name attribute of instructor to the department relation. Give examples of inserts and deletes to these relations that can cause a violation of the foreign-key constraint.

Inserting tuple: (11111, Alan, IT, 90000)

Deleting tuple: (Physics, Alan, 90000)

employee (**ID**, person_name, street, city)

works (**ID** , person_name, company_name, salary)

company (**company_name**, city)