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### Laboratory Work #1

1. employee (ID, person\_name, street, city)  
works (employee\_ID, company\_name, salary)  
company (company\_name, city)

$$R_1 \leftarrow (employee \bowtie_{employee.ID = works.employee\_ID} works)$$

$$\pi_{employee.ID, employee.person\_name} (\sigma_{works.company\_name = "BigBank"} (R_1))$$

$$R_1 \leftarrow (employee \bowtie_{employee.ID = works.employee\_ID} works)$$

$$\pi_{employee.ID, employee.person\_name, employee.city} (\sigma_{works.company\_name = "BigBank"} (R_1))$$

$$R_1 \leftarrow (employee \bowtie_{employee.ID = works.employee\_ID} works) \bowtie_{works.company\_name = company.company\_name} company$$
$$\pi_{employee.ID, employee.person\_name} (\sigma_{employee.city = company.city} (R_1))$$

$$R_1 \leftarrow (employee \bowtie_{employee.ID = works.employee\_ID} works) \left( \sigma_{works.company\_name = "BigBank" \wedge works.salary > 10000} (R_1) \right)$$
$$\pi_{employee.ID, employee.person\_name, employee.city, employee.street}$$

3 и 4 перепутала местами.



2.  $R_1 \leftarrow (\text{employee} \bowtie_{\text{employee.ID} = \text{works, employee.ID}} \text{works})$

$\Pi_{\text{employee.ID, employee.person\_name}} (\sigma_{\text{works, company\_name} \neq \text{"Big Bank"}} (R_1))$

$R_1 \leftarrow (\text{employee} \bowtie_{\text{employee.ID} = \text{works, employee.ID}} \text{works})$

$\Pi_{\text{employee.ID, employee.person\_name}} (\sigma_{\text{works, salary} = (\text{min}(\text{works, salary})(\text{works}))} (R_1))$

3. Consider the tables:

instructor (ID, name, dept\_name, salary)

department (dept\_name, building, budget)

Where there is a constraint of primary-foreign keys (in department, "dept\_name" is primary, in instructor is foreign)

For insert violation: If we try to insert data into instructor with ID, name, "Kamila", salary. However there is no such dept\_name, "Kamila" in department table. We get violation of primary-foreign key violation.

For delete violation: We have dept\_name, "Kamila" in both instructor table and department table. If we firstly try to delete ~~"Kamila"~~ "Kamila" in department which is primary key we get violation since it is foreign key in instructor.



4. Consider the table:

Employee (ID, person-name, street, city)

ID - primary key column.

in table works( employee-ID, company-name, salary)  
the primary key is compound key of (employee-ID,  
pair company-name)

in table company( company-name, city)  
the primary key is company-name.