

Laboratory work 1

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1) Consider the employee database of figure below. Give an expression in the relational algebra to express each of the following queries

- $\Pi \text{ ID, person_name } (\sigma \text{ company_name} = \text{"Big Bank"} (\text{works}))$
- $\Pi \text{ ID, person_name, city } (\sigma \text{ company_name} = \text{"Big Bank"} (\text{works} \times \text{employee}))$
- $\Pi \text{ ID, person_name, city, street } (\sigma \text{ company_name} = \text{"Big Bank"} \wedge \text{salary} > 10000 (\text{works} \times \text{employee}))$
- $\Pi \text{ ID, person_name } (\sigma \text{ employee.city} = \text{company.city} (\text{employee} \times \text{works} \times \text{company}))$

employee (ID, person_name, city, street)

works (ID, person_name, company_name, salary)

company (company_name, city)

2) $\Pi \text{ ID, person_name } (\sigma \text{ company_name} \neq \text{"Big Bank"} (\text{works}))$

$\Pi \text{ ID, person_name } (\text{employee}) - \Pi \text{ ID, person_name } (\rho_a (\text{employee}) \bowtie \rho_b (\text{employee}))$

3) Deleting the tuple: (Biology, Watson, 90000)

from the department table, where at least one student or instructor tuple has dept name as Biology, would violate the foreign key constraint.

Inserting a tuple: (10111, Ostrom, Economics, 110,000)

into the instructor table, where the department table does not have the department Economics, would violate the foreign key constraint.

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

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

company (**company_name**, city)