

Lab 1  
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1.

- Find the ID and name of each employee who works for “BigBank”.

$\Pi_{ID, person\_name} (\sigma_{company\_name = \text{“BigBank”}} (works))$ .

- Find the ID, name, and city of residence of each employee who works for “BigBank”.

$\Pi_{ID, person\_name, city} (employee \bowtie_{employee.id=works.id} (\sigma_{company\_name = \text{“BigBank”}} (works)))$

- Find the ID, name, street address, and city of residence of each employee who works for “BigBank” and earns more than \$10000.

$\Pi_{ID, person\_name, street, city} (\sigma_{(company\_name = \text{“BigBank”} \wedge salary > 10000)} (Works \bowtie_{employee.id=works.id} employee))$

- 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.

$\Pi_{ID, person\_name} (\sigma_{employee.city=company.city} (employee \bowtie_{employee.ID=works.ID} works \bowtie_{works.company\_name=company.company\_name} company))$

2.

- Find the ID and name of each employee who does not work for “BigBank”.

$\Pi_{ID, person\_name} (\sigma_{company\_name \neq \text{“BigBank”}} (works))$ .

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

$\Pi_{ID, person\_name} (\sigma_{salary \geq avg(salary)} (works))$ .

3. 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 a tuple: (20100, Astana, Economics, 180,000) into the instructor table, where the department table does not have the department Economics, would violate the foreign key constraint.

Deleting the tuple: (Chemistry, Makhabbat, 60000) from the department table, where at least one student or instructor tuple has dept name as Chemistry, would violate the foreign key constraint.

4. Consider the employee database of figure above. What are the appropriate primary keys?

employee (person name, street, city)

works (person name, company name, salary)

company (company name, city)