

Laboratory work 1

employee (person_name, street, city)
works (person_name, company_name, salary)
company (company_name, city)

1.1

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

$\Pi_{ID, person_name}(\sigma_{company_name="BigBank"}(works))$

1.2

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

$\Pi_{employee.ID, employee.person_name, employee.city}(\sigma_{employee.ID=works.ID \wedge works.company_name=company.company_name}(employee \times works \times company))$

1.3

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

$\Pi_{employee.ID, employee.person_name, employee.street, employee.city}(\sigma_{employee.ID=works.ID \wedge works.company_name="BigBank" \wedge company.company_name="BigBank" \wedge works.salary > 10000}(employee \times works \times company))$

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.

$\Pi_{employee.ID, employee.person_name}(\sigma_{employee.ID=works.ID \wedge works.company_name=company.company_name \wedge employee.city=company.city}(employee \times works \times company))$

2.1

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

$\Pi_{ID, person_name}(\sigma_{company_name \neq "BigBank"}(works))$

2.2

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.

instructor (ID, name, dept_name, salary)

department (dept_name, building, budget)

if insert (13, Aleksandr, PP1, 200000) to instructor, the foreign key constraint will collapse, because department doesn't have PP1 in dept_name.

if delete (PP2, KBTU, 200000) from department, the foreign key constraint will collapse by the same way. PP2 in the instructor.dept_name, but not in the department.dept_name.

4

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

employee (ID, person_name, street, city) primary key - ID

works (ID, person_name, company_name, salary) primary key - ID

company (company_name, city) primary key – company_name