

Maratuly Temirbolat 18BD117358

Tables: $employee(ID, person_name, street, city)$
 $works(employee_ID, company_name, salary)$
 $company(company_name, city)$

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

$\Pi_{employee.ID, employee.person_name} (\sigma_{works.company_name = 'BigBank'} (R_1))$

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

$\Pi_{employee.ID, employee.person_name, employee.city} (\sigma_{works.company_name = 'BigBank'} (R_1))$

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

$\Pi_{employee.ID, employee.person_name, employee.city, employee.street} (\sigma_{works.company_name = 'BigBank' \wedge works.salary > 10000} (R_1))$

$R_1 \leftarrow ((employee \bowtie_{employee.ID = works.employee_ID} works) \bowtie_{works.company_name = company.company_name} company)$

$\Pi_{employee.ID, employee.person_name} (\sigma_{employee.city = company.city} (R_1))$

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

$\Pi_{employee.ID, employee.person_name} (\sigma_{works.company_name \neq "Big\ Bank" (R_1)})$

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

$\Pi_{employee.ID, employee.person_name} (\sigma_{works.salary = (gmin(works.salary)(works)) (R_1)})$

3. Considering the tables: instructor (ID, name, dept_name, salary) and 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, "Temirbolat", salary. However there is no such dept_name "Temirbolat" in department table. We get violation of primary-foreign key relation.

For delete violation: If we have dept_name "Temirbolat" in both instructor table and department table. If we firstly try to delete "Temirbolat" in department which is primary key we get violation since it is foreign key in instructor.

4. Considering the table :

Employee(ID, person_name, street, city)

The primary key is ID column.

In table Works(employee_ID, company_name, salary)

the primary key is compound key of (employee_ID, company_name)

In table company(company_name, city)

the primary key is company_name