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Laboratory work 1

1.

• Find the ID and name of each employee who works for "BigBank".

$$\prod_{ID, name}(\sigma_{company\_name=BigBank}(employee \bowtie_{employee.ID=works.ID} works))$$

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

$$\prod_{ID, name, city}(\sigma_{company\_name=BigBank}(employee \bowtie_{employee.ID=works.ID} works))$$

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

$$\prod_{ID, name, city}(\sigma_{company\_name=BigBank \land alary>\$10000}(employee \bowtie_{employee.ID=works.ID} works))$$

• 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

$$\prod_{ID, name}(employee \bowtie_{employee.city=company.city} company))$$

2.

• Find the ID and name of each employee who does not work for "BigBank".

$$\prod_{ID, name}(\sigma_{companyname\neg=BigBank}(employee \bowtie_{employee.ID=works.ID} works))$$

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

$$\prod_{ID,\ name}(\sigma_{salary=average\_salary}(works),\ where$$
$$average\_salary = arithmetic\ mean\ of\ salaries\ in$$
$$database)$$

3.

If we delete attribute dept_name from "department" relation can cause a violation of the foreign-key constraint, because now dept_name attribute in "instructor" relation has no references. Also it will distruct the logic of the "department" relation since it doesn't have the main describing information(unique ID number).

4.

"ID" is an appropriate primary key, because it describes unique tuple of each possible relation.