Laboratory work 1

Employee(person_name,street,city)
Works(person_name,company_name,salary)
Company(company_name,city)

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

$$\prod_{id,person\ name}(\sigma_{company\ name=\text{"BigBank"}}(works))$$

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

$$\prod_{id,person\ name,city}(\sigma_{employee.id=works.id}(employee \times \sigma_{company\ name=\text{"BigBank"}}(works))$$

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

$$\prod_{id,person\ name,street,city}(\sigma_{company\ name=\text{"BigBank"} \wedge salary>10000}(\sigma_{works.id=employee.id}(works \times employee))$$

• 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.

$$\prod_{id,person\_name}(\sigma_{employee.city=company.city}(employee \bowtie_{emloyee.id=works.id} works \bowtie_{works.company\ name=compant.company\ name} company))$$

2. Consider the employee database of figure above. Give an expression in the relational algebra to express each of the following queries:

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

$$\prod_{id,person\ name}(employee) - \prod_{id,person\ name}(employee \bowtie_{employee.id=works.id} (\sigma_{company\ name=\text{"BigBank"}}(works)))$$

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

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.

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

The appropriate primary keys are *person_name, person_name, company_name*.