Laboratory work 1

**employee(ID, person\_name, street, city)  
works(ID, person\_name, company\_name, salary)  
company(company\_name, city)**

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

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

∏ ID, person\_name (σcompany\_name= “BigBank” (works))

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

∏ ID, person\_name, city (σcompany\_name= “BigBank” (σemployee.ID=works.ID ˄ employee.person\_name = works.person\_name (employee x works)))

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

∏ ID, person\_name, street, city (σcompany\_name= “BigBank” ˄ salary>10000

(σemployee.ID=works.ID ˄ employee.person\_name = works.person\_name (employee x 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.

∏ID, name (σemployee.city=compony.city (employee x compony))

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”.

∏ID, person\_name(σcompany\_name ≠ “BigBank”)

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

∏ID, person\_name(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.

**employee(ID, person\_name, street, city)  
works(person\_name, company\_name, salary)  
company(company\_name, city)**

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

**employee(ID, person\_name, street, city)  
works(ID, person\_name, company\_name, salary)  
company(company\_name, city)**

**For “employee” and “works” => “ID”  
For “works” and “company” => “company\_name”**