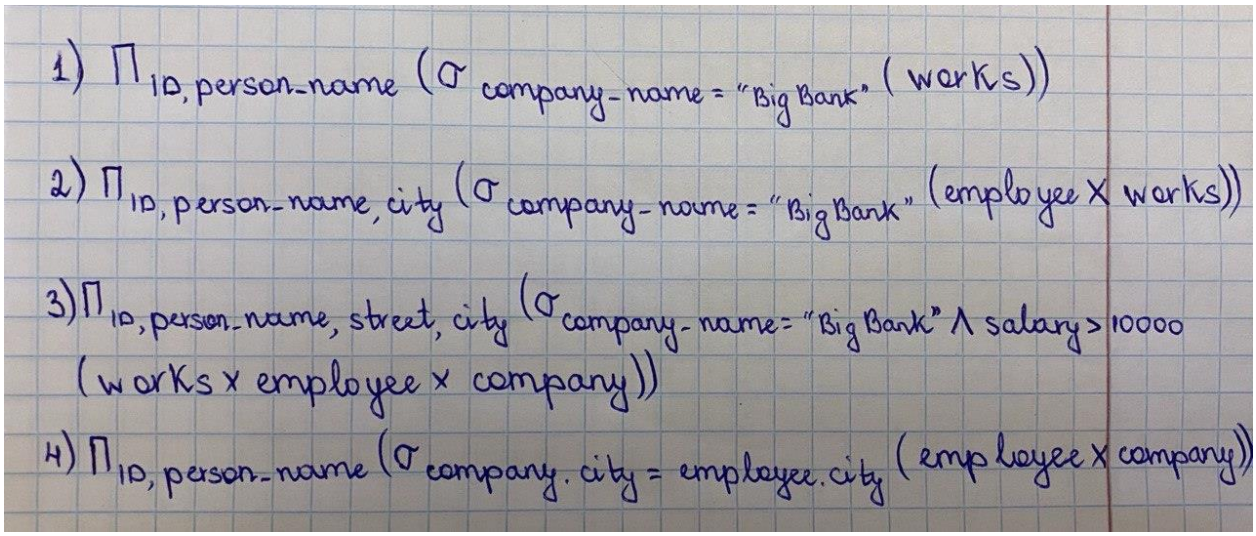
**Laboratory work №1**

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

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

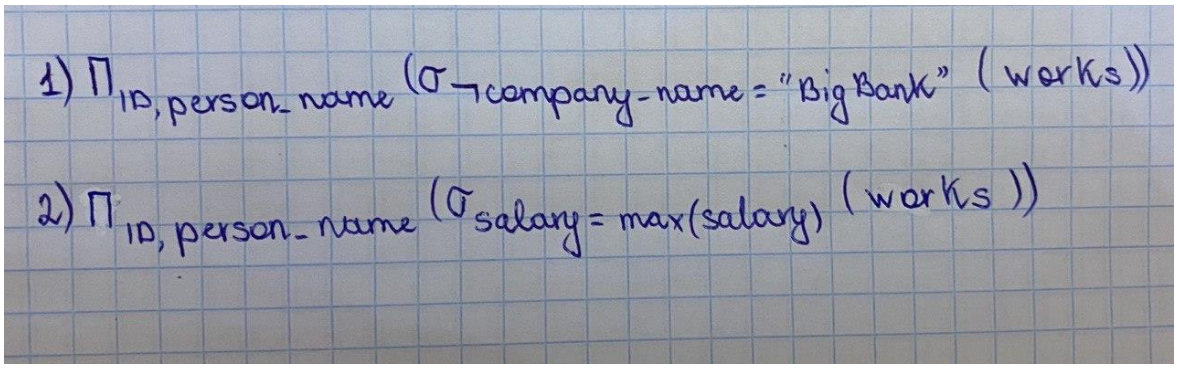
**Answer:**




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

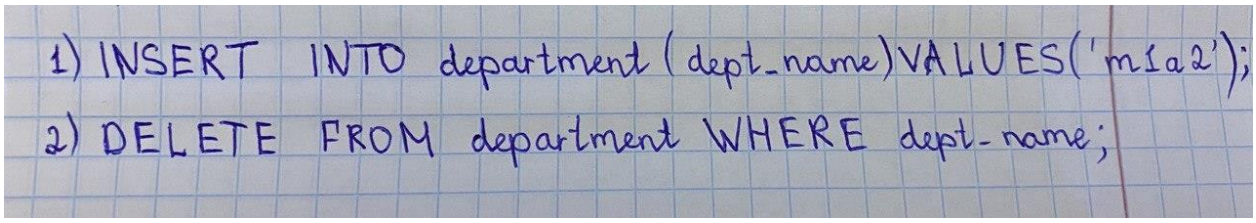
**Answer:**



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.

**Answer:**

We can insert a row with non-existing department to the instructor relation and delete some row from department relation.




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

**Answer:**

Conditionally we have an ID on the database “employee”, therefore ID will be primary key, otherwise person_name.