LAB 1. DataBase Yerzhanov Abylay 19B030739

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

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

.$\prod_{id,name}(\sigma_{company\_name = \text{“BigBank”}}(works))$

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

$\prod_{id,name,city}(\sigma_{company\_name = \text{“BigBank”}}(works \bowtie employee))$

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

$\prod_{id,name,city,street}(\sigma_{company\_name = \text{“BigBank”} \wedge salary > 10{,}000}(works \bowtie emplyee))$

4. 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

$\prod_{id,name}(\sigma_{employee\_city = company.city}(employee \bowtie company))$

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

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

$\prod_{id,name}(\sigma_{company\_name \neq \text{“BigBank”}}(works))$

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

$\prod_{id,name}(\sigma_{salary \geq avg(salary)}(works))$

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.

INSERT INTO department (dept_name) VALUES ('77777');

DELETE FROM instructor WHERE dept_name;

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

For employee we can choose: **person_name;**

For works we can choose: **person_name, company_name;**

For company we can choose: **company_name;**