Laboratory work 1

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Please write your answers to the pdf file for defense:

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”.

Πperson.ID, person_name (σ company_name=“BigBank” (works X employee))

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

Πperson.ID, person_name, person_city (σ company_name=“BigBank” (works X employee))

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

Πperson.ID, person_name, street, person_city (σ company_name=“BigBank” ∧ salary > 10000$ (works X 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.

Πperson.ID, person_name, street, person_city (σ company_name=“BigBank” ∧ salary > 10000$ (works X employee))

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”.

Πperson.ID, person_name (σ company_name ≠ “BigBank” (works X employee))

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

Πperson.ID, person_name (σ company_name ≠ “BigBank” (works X employee))

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 (‘13454’);

DELETE FROM instructor WHERE dept_name;

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

employee (person name, street, city)

works (person name, company name, salary)

company (company name, city)