Databases Lab 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:

employee (*person_name*, *street*, *city*)
works (*person_name*, *company_name*, *salary*)
company (*company_name*, *city*)

Figure

- 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.

None of databases above have "ID" column, but if they had:

$\prod_{ID,person\_name}(\sigma_{company\_name="BigBank"}(works))$

$\prod_{ID,person\_name,city}(emploee \bowtie_{emploee.person\_name=works.person\_name \wedge company\_name="BigBank"} works)$

$\prod_{ID,person\_name,city}(employee \bowtie_{employee.person\_name=works.person\_name \wedge company\_name="BigBank" \wedge salary>10000} works)$

$\prod_{ID,person\_name}(works \bowtie_{works.company=company1.company} \rho_{company1}(\sigma_{emloyee.city=company.city}(emloyee \times company)))$

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

$$\prod_{ID,person\_name}(\sigma_{company\_name<>"BigBank"}(works))$$

$$\prod_{ID,person\_name}(works) -$$
$$\prod_{ID,person\_name}(\sigma_{works.salary<works1.salary}(works \times \rho_{works1}(works)))$$

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

Primary keys must be unique, so best option is “id”(if there was it) or “person_name”