

# Lab 1

1. employee (person-name, street, city)  
works (person-name, company-name, salary)  
company (company-name, city)

a) ID and name, who works for "BigBank":

$\prod_{ID, \text{person-name}} (\exists \text{company-name} = "BigBank" (\text{works}))$

b)  $\prod_{ID, \text{person-name}, \text{city}} (\exists \text{company-name} = "BigBank" (\text{employee} \times \text{works}))$

c)

$\prod_{ID, \text{person-name}, \text{street}, \text{city}} (\exists \text{company-name} = "BigBank" \wedge \text{salary} > 10000 (\text{employee} \times \text{works}))$   
 $\wedge \text{employee.ID} = \text{works.ID}$

d)  $\prod_{ID, \text{person-name}} (\exists \text{employee.city} = \text{company.city} (\text{employee} \times \text{company}))$

2. ID and name who does not work in

"BigBank":  $\prod_{ID, \text{person-name}} (\exists \text{employee.ID} = \text{works.ID} (\text{employee} \times \text{works}))$

$\neg \prod_{ID, \text{person-name}} (\text{employee} \Delta \text{works} \wedge \text{employee.ID} = \text{works.ID} \wedge \text{company-name} = "BigBank")$

$$\prod_{i \in IP, i \in \text{person-name}} \left( G_i \cdot \text{salary} = w \cdot \text{salary} (P_i(\text{works}) \times P_w(\text{works})) \right)$$

3.

1) Inserting a tuple with non-existing department.

Example:

( "00001", "Mask", "Tesla", "99999999" )

2) Delete a tuple in department relation, if someone teaches in this department.

( "22222", "Einstein", "Physics", "95000" )

DELETE ( "Physics", "Watson", "70000" )

4. In employee relation the primary key is "person-name"

In the works relation the primary key is "person-name"

In the company relation the primary key is "company-name".