

## Laboratory work 1

1.  $\Pi_{ID, person\_name} (\sigma_{company\_name = \text{"BigBank"}} (works))$   
 $\Pi_{ID, person\_name, city} (employee \bowtie_{employee.ID = works.ID} (\sigma_{company\_name = \text{"BigBank"}} (works)))$   
 $\Pi_{ID, person\_name, street, city} ((\sigma_{company\_name = \text{"BigBank"} \wedge salary > 10000} (works \times employee)))$   
 $\Pi_{ID, person\_name} (\sigma_{employee.city = company.city} (employee \bowtie_{employee.ID = works.ID} works \bowtie_{works.company\_name = company.company\_name} company))$
2.  $\Pi_{ID, person\_name} (\sigma_{\neg (company\_name = \text{"BigBank"})} (works))$   
 $\Pi_{ID, person\_name} (\sigma_{employee.ID = works.ID \wedge salary > avg(salary)} (works \times employee))$
3. If we insert a tuple into the “instructor” table named dept\_name that is not in the “department” table, it would be a violation of the foreign key constraint. For example inserting a tuple: (22222, Einstein, Physics, 95000) to the “instructor” table, where there is no department of Physics in the “department” table will violate the foreign key constraint.  
If we delete a tuple from the "department" table named dept\_name that exists in the "instructor" table, that would also be a violation. For instance deleting tuple: (Physics, Watson, 70000) from the "department" table where at least one instructor tuple has dept\_name Physics will violate the foreign key constraint.
4. Primary key will be  
Employee ID(if present) or person\_name  
Works ID(if present) or person\_name  
Company ID(if present) or company\_name