1.1) $\prod_{person\_name}(\sigma_{company\_name = \text{“BigBank”}}(works))$

1.2) $\prod_{person\_name,\ city}(\sigma_{company\_name = \text{“BigBank”}}(works)) \bowtie_{works.person\_name=employee.person\_name} employee)$

1.3) $\prod_{person\_name,\ street,\ city}(\sigma_{company\_name = \text{“BigBank”} \wedge salary > 10000}(works)) \bowtie_{works.person\_name=employee.person\_name} employee)$

1.4) $joined \leftarrow (works \bowtie_{works.company\_name=company.company\_name} company)$

$\prod_{person\_name}(joined \bowtie_{joined.person\_name=employee.person\_name \wedge joined.city=employee.city} employee)$

2.1) $\prod_{person\_name}(employee) - \prod_{person\_name}(\sigma_{company\_name = \text{“BigBank”}}(works))$

2.2) $\prod_{person\_name}(works) - \prod_{works.person\_name}(works \bowtie_{works.salary \leq works\_2.salary} \rho_{works\_2}(works))$

3) instructor(ID, name, dept_name, salary)

department(dept_name, building, budget)

Inserting: (22222, Einstein, Physics, 95000)

into the instructor table, where the department table doesn't have the department Physics, would violate the foreign key constraint

Deleting: (Physics, Watson, 70000)

From the department table, where at least one instructor has dept_name as Physics, would violate the foreign key constraint

4) Candidate keys: {person_name}, {street}, {city}. One of them can be primary key. In the RM of DB, a primary key is a specific choice of a minimal set of attributes