Parley Pacheco Martins 1484000 - Assignment 2

2.1 - c)

$$sbc\_employees \leftarrow \sigma_{company\_name="Small\ Bank\ Corporation"}(works)$$
$$\Pi_{person\_name}(\sigma_{works.salary>sbc\_employees.salary}(works \bowtie sbc\_emplyees)) \quad (1)$$

2.5 - a)

$$\Pi_{person\_name}(\sigma_{company\_name="First\ Bank\ Corporation"}) \quad (2)$$

c)

$$jobs \leftarrow employee \bowtie works$$
$$fbc \leftarrow \sigma_{company\_name="First\ Bank\ Corporation",salary>10,000}(jobs) \quad (3)$$
$$\Pi_{person\_name,street,city}(fbc)$$

2.6 -
$$\Pi_{customer\_name,customer\_city}(borrower \bowtie customer) \quad (4)$$

a) Jackson does not appear in the results because he is not in the customer relation (as seen in Figure 2.4). When we include the attribute *city* in our projection, we remove Jackson from our results.

b) I would make the attribute *customer_name* in the borrower relation a foreign key, forcing any borrower to be a bank customer.

c)
$$\Pi_{customer\_name,customer\_city}(borrower ⧓ customer) \quad (5)$$

2.8 a)

$$\Pi_{account\_number}(G_{\mathbf{count}(account\_number)>1}(depositor)) \quad (6)$$

5.6 a)

$$\{t \mid \exists\ s \in works(t[person\_name] = s[person\_name]\ \wedge$$
$$s[company\_name] = "First\ Bank\ Corporation"\} \quad (7)$$

c)

$$\{t \mid \exists\ s \in works(t[person\_name] = s[person\_name]\ \wedge$$
$$s[company\_name] = "First\ Bank\ Corporation"\ \wedge$$
$$s[salary] > 10,000)\ \wedge \quad (8)$$
$$\exists\ u \in employee(u[person\_name] = s[person\_name]\ \wedge$$
$$t[street] = u[street] \wedge t[city] = u[city])\}$$