2.1 - a)

$$jobs \leftarrow employee \bowtie works \tag{1}$$

$$\Pi_{person\_name}(\sigma_{company_name=\text{"}Small\ Bank\ Corporation\text{"}}) \tag{2}$$

2.5 - a)

$$\Pi_{person\_name}(\sigma_{company_name=\text{"}First\ Bank\ Corporation\text{"}}) \tag{3}$$

c)

$$jobs \leftarrow employee \bowtie works \tag{4}$$

$$\sigma_{company\_name=\text{"}First\ Bank\ Corporation\text{"},salary>10{,}000}(jobs) \tag{5}$$

2.6 -

$$\Pi_{customer\_name,customer\_city}(borrower \bowtie customer) \tag{6}$$

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)

$$\Pi_{customer\_name,customer\_city}(borrower \rtimes customer) \tag{7}$$

2.8 a)

$$\Pi_{account\_number}(\sigma_{company_name=\text{"}First\ Bank\ Corporation\text{"}}) \tag{8}$$

b)

$$\Pi_{account\_number}(G_{\mathbf{count}(account\_number)>1}(account)) \tag{9}$$