company (company-name, city)

4.2 (h) Assume the companies may be located in several cities. Find all companies located in every city in which SBC is located.

$$\{ t \mid \exists c \in \text{company} (t[\text{comp-name}]=c[\text{comp-name}] \wedge$$
$$\forall c1 \in \text{company} (c1[\text{comp-name}] = \text{“SBC”} \Rightarrow$$
$$\exists c2 \in \text{company} (c2[\text{comp-name}]=c[\text{comp-name}]$$
$$\wedge\ c2[\text{city}] = c1[\text{city}]))) \}$$

$$\{ t \mid \exists c \in \text{company} (t[\text{comp-name}]=c[\text{comp-name}] \wedge$$
$$\neg\exists c1 \in \text{company} (c1[\text{comp-name}] = \text{“SBC”} \wedge$$
$$\neg\exists c2 \in \text{company} (c2[\text{comp-name}]=c[\text{comp-name}]$$
$$\wedge\ c2[\text{city}] = c1[\text{city}]))) \}$$

```
select c.company-name
from   company c
where not exists
        ((select city
          from company c1
          where c1.company-name = 'SBC' and
             not exists
             (select *
              from company c2
              where c2.comp-name = c.comp-name
                        and c1.city = c2.city))

select c.company-name
from   company c
where not exists
        ((select city
          from company c1
          where c1.company-name = 'SBC' and
             c1.city  not in
             (select c2.city
              from company c2
              where c2.comp-name = c.comp-name))
```