Assignemnt 3

Artem Golovin

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Question 1

a.

$$\text{RedBooks} \leftarrow \sigma_{(\text{color = "red"})}(\text{Book})$$
$$\text{A} \leftarrow \text{RedBooks} \bowtie_{(\text{RedBooks.ISBN = Distribute.ISBN})} \text{Distribute}$$
$$\text{Calgary} \leftarrow \sigma_{(\text{sname = "Calgary"})}(\text{A})$$
$$\text{Result} \leftarrow \pi_{(\text{name, city})}(\text{A - Calgary})$$

b.

$$\text{Schools} \leftarrow \sigma_{(\text{city = "Paris"})}(\text{School})$$
$$\text{A} \leftarrow \text{Schools} \bowtie_{(\text{sname = name})} \text{Distribute}$$
$$\text{B} \leftarrow \text{A} \bowtie_{((\text{pname = name}) \text{ and } (\text{Publisher.city = "London"}))} \text{Publisher}$$
$$\text{Result} \leftarrow \pi_{(\text{director})}(\text{B})$$

c.

$$\text{RomePublishers} \leftarrow \sigma_{(\text{city = "Rome"})}(\text{Publisher})$$
$$\text{A} \leftarrow \text{RomePublishers} \bowtie_{((\text{pname = name}) \text{ and } (\text{sname = "Toronto"}))} \text{Distribute}$$
$$\text{B} \leftarrow \text{A} \bowtie_{(\text{sname = name})} \text{School}$$
$$\text{Result} \leftarrow \pi_{(\text{School.name})}(\text{B})$$

d.

$$\text{CalgarySchools} \leftarrow \sigma_{(\text{city = "Calgary"})}(\text{School})$$
$$\text{A} \leftarrow \text{CalgarySchools} \bowtie_{(\text{sname = name})} \text{Distribute}$$
$$\text{B} \leftarrow \text{A} \bowtie_{(\text{A.ISBN = Book.ISBN})} \text{Book}$$
$$\text{Result} \leftarrow \pi_{(\text{name, count})}(\text{title} f_{(\text{COUNT name})}(\text{Titles}))$$

e.

$$\text{A} \leftarrow \text{Publisher} \bowtie_{(\text{name = pname})} \text{Distribute}$$
$$\text{B} \leftarrow \text{A} \bowtie_{(\text{A.city = School.city})} \text{School}$$
$$\text{C} \leftarrow \text{Book} \bowtie_{(\text{Book.ISBN = B.ISBN})} \text{B}$$
$$\text{Result} \leftarrow \pi_{(\text{name, count})}(\text{title} f_{(\text{COUNT name})}(\text{C}))$$

Question 2

a.

$\{$x.stno|Street(x) and $\exists$(c)(City(c) and

c.country-name = "Canada" and $\forall$(s)(Street(s) and

(x.city-name = s.city-name) $\rightarrow$ (x.length > s.length)))$\}$

b.

$\{$x.owner-name|House(x) and $\exists$(c)$\exists$(s)(City(c) and Street(s) and

s.city-name = c.city-name and c.country-name = "Canada"

x.stno = s.stno)$\}$

c.

$\{$x.owner-name|House(x) and $\exists$(s)$\exists$(c)(Street(s) and City(c) and

x.stno = s.stno and not(c.country-name = "USA")) and

$\forall$(c)$\exists$(s)(City(c) and Street(s) and

(c.country-name = "USA") $\rightarrow$ (s.stno = x.stno))$\}$

d.

$\{$x.name|Country(x) and $\exists$c(Country(c) and

c.name = x.name and Border(c.name, "Germany"))$\}$

e.

$\{$x.owner-name|House(x) and $\exists$(c)$\exists$(s)(City(c) and Street(s)

and Border(c.country-name, "Spain")

and s.city-name = c.city-name and s.stno = x.stno)$\}$