4CCS1ELA - Elementary Logic with Applications
Programming with Logic III:

Logic Programming

Tutorial List 8 Solutions

Question 1:

Solution: See slides

Question 2:

a) Solution: See slides

b) There can be two solutions:

1. Add the following rules to the program:

direct_flight(x, y) → direct_journey(x, y) and
direct_train(x, y) → direct_journey(x, y)

andthen modify rules 1) and 2) as follows:
1) ***direct_journey(x, y)*** *→ travel_from(x, y)*
2) ***direct_journey(x, z)****, travel from(z, y) → travel_from(x, y)*

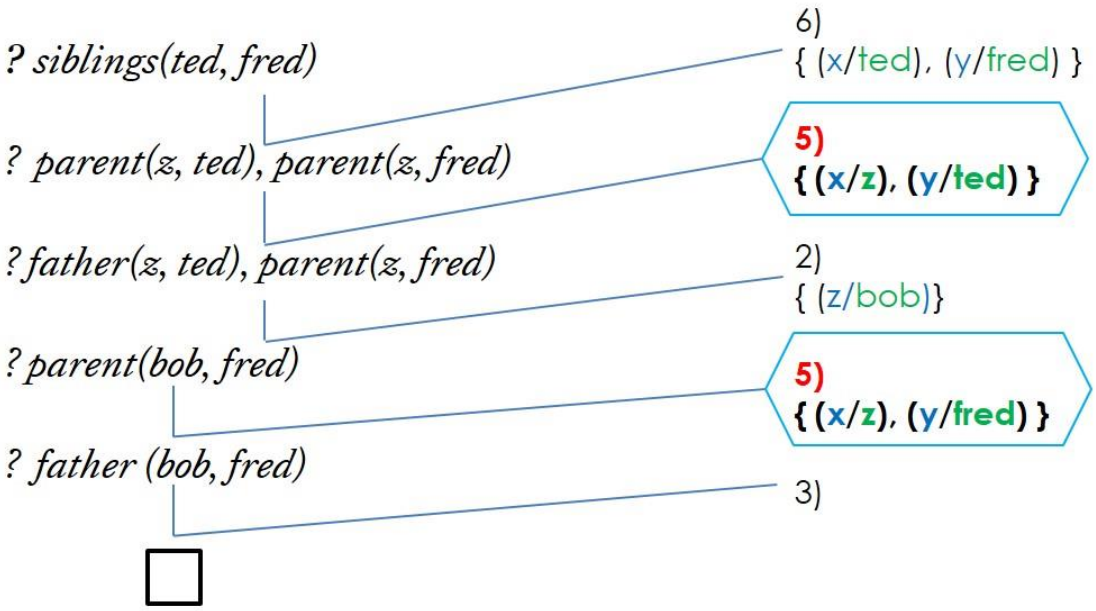
2. **Or** simply add these rules to the program:

direct_train(x, y) → travel_from(x, y)
direct_train(x, z), travel_from(z, y) → travel_from(x, y)

Question 3:

Solution:

1) *mother(anne, ted)*
2) *father(bob, ted)*
3) *father(bob, fred)*
4) *mother(x,y) →parent(x,y)*
5) *father(x,y) →parent(x,y)*
6) *parent(z, x), parent(z, y) → siblings(x, y)*



Question 4:

Solution:

a)

directly_contains(katarina, olga)
directly_contains(olga, natasha)
directly_contains(natasha, irina)

b)

directly_contains(x, y) → contains(x, y)

directly_contains(x, z), contains(z, y) → contains(x, y)