Serie 10 - Logic Programming

Exercise 1

Answer the following questions about Logic Programming:

a. When does Prolog backtrack and how does backtracking work?

b. What is meant by “negation by failure”?

c. In which cases does Prolog assume that the answer to a query is false?

d. Is it possible to implement negation without both, cut and fail? What about leaving out one of them?

Exercise 2

We will build a genealogy that covers 3 generations of a family. Consider a genealogy database consisting of the following predicates (as in the lecture notes):

female(x), male(x), parent(x,y), sibling(x,y), mother(x,y), father(x,y),
aunt(x,y), uncle(x,y), sister(x,y), brother(x,y)

Define rules allowing you to determine the following 12 relations:

grandfather(x,y), grandmother(x,y), grandparent(x,y),
son(x,y), daughter(x,y), child(x,y),
grandson(x,y), granddaughter(x,y), grandchild(x,y),
niece(x,y), nephew(x,y), cousin(x,y)

Exercise 3

Define the following predicates to determine if a list:

a. has an odd number of elements;

b. is a permutation of another list;

c. is formed by merging two lists;

d. is a palindrome (i.e. it reads the same from left to right as it does from right to left).