

1998 Paper 5 Question 7

Prolog for Artificial Intelligence

Write Prolog programs that define the following predicates. Your programs should ensure that backtracking does not produce spurious alternative solutions.

- (a) The n th element of a list: `nth(X,N,L)` instantiates X to the N th element of list L . Assume that list elements are numbered increasing from 1. [4 marks]
- (b) The last element of a list: `last(X,L)` instantiates X to the last element of list L . [4 marks]
- (c) Remove an element from a list: `remove(X,L,M)` instantiates M to a list containing all the elements of list L except for every occurrence of term X . [6 marks]
- (d) Substitute one element for another: `subst(L,X,Y,M)` instantiates M to a list containing all the elements of list L except that every occurrence of term X in L is replaced by term Y in M . [6 marks]