Knowledge Representation

Assignment 1

Prolog Genesis : Tree searches and lists

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1. Drawing search trees

Given the program in A, draw the search tree for the following queries :

- has_killed(X,Y), father(Y,X).
- templar(X), has_killed(Y,X).

Draw also the search trees for the following predicates :

- assassin(Y), has_killed(Y,X).
- has_killed(Y,X), assassin(Y).

What can you tell?

2. Take-home exercise

- Write the predicate concat(+L1,+L2,-L3) which succeeds if L3 is the concatenation of lists L1 and L2 (example : concatenation of [a,b] and [c,d] is [a,b,c,d])
- Write the predicate flatten(+L,-L2) which succeeds if L2 is the flat version of L. You should use the concat predicate inside.
  - A flat list of a list contains only the atoms of the latter. For example, [a,b,c,d] is the flatten version of [a,[b,c,[d]]]
- Draw the search tree of flatten([[[a]], b],L2).
- Write the predicate efficient_flatten(+L,-L2) which is an improved version of flatten. Draw the search tree. What do you observe ?

A. PROGRAM

1. assassin(desmund). ;
2. assassin(william). ;
3. assassin(connor). ;
4. assassin(achilles). ;
5. assassin(ezio). ;
6. assassin(altair). ;
7. templar(haytham). ;
8. templar(charles). ;
9. templar(vidic). ;
10. templar(cesare). ;
11. has_killed(desmund, vidic). ;
12. has_killed(connor, haytham). ;
13. has_killed(ezio, cesare). ;
14. father(william, desmund). ;
15. father(haytham, connor). .