Assignment 1 - AI (CSCI 392) -

August 15, 2018

In this assignment you are to program a set of tools in LISP allowing you to search a particular problem efficiently.

1. Implement a tree parsing function. You will get a list of lists and build a tree. The input has the form as (Node-Name (Child 1) (Child 2) ... (Child n)). Each child has a recursive structure based on this expression.

   (a) Print the tree in a breadth first manner. For instance (A (B (C (D)) (E (F) (G (H)))) (J (K (L (M) (N (P)))))) would be printed as
   A
   B J
   C E K
   D F G L
   H M N
   P

   (b) Print a tree in a child successor manner from left to right. For the input (A (B (C (D)) (E (F) (G (H)))) (J (K (L (M) (N (P)))))) the output would be
   A, B J
   B, C E
   J, K
   C, D
   E, F G
   K, L
   D,
   F,
   G, H
   L, M N
   H,
   M,
   N, P
   P,

2. Implement a tree parsing function. You will get a list of lists and build a tree. Each node is represented by a number and a name. The name is the name of nodes and the number the cost of the edge transition. Print the tree as in the previous exercise but adding the cost. Now every node name is a binome (Node-Name,Cost). The cost represents the cost from the node parent to this node. Thus a tree ((A,0) ((B,5) ((C,3) ((D,4))) ((E,2) ((F,1)) ((G,7) ((H,9))))) ((J,1) ((K,3) ((L,1) ((M,7)) ((N,1) ((P,2))))))) will be printed according to the first method as:
   A,0

B,5 J,1
C,8 E,7 K,4
D,12 F,8 G,14 L,5
H,23 M,12 N,6
P,8
and using the second method as:
A,0; B,5 J,1
B,5; C,3 E,2
J,1; K,3
C,8; D,4
E,7; F,1 G,7
K,4; L,1
D,12;
F,8;
G,14 H,9
L,5; M,7 N,1
H,23;
M,1;
N,6; P,2
P,8;