National Institute of Technology Calicut
Department of Computer Science and Engineering
Third Semester B. Tech.(CSE)
CS2092D Programming Laboratory

Evaluation - Assignment #8 (12.11.2020)

Instructions: Two questions are given below. Complete each question in the given sequence. For questions 1, write the design in the shared doc, get your design approved by the instructor before you start coding. Proceed to the next question only after showing the results of the previous program to your instructor. In case of clarifications, your instructor will help you.

Marks (Design + Implementation): Q1: 4+4 Q2: 0+2

Time: Q1 and Q2: till 4.00 P.M. The marks for implementation will be based on the results for the test cases. The instructor will be conducting a viva-voce, if required. You should send the screen shots of your result to the instructor before 4.00 P.M.

1. Write a program that reads an assignment statement of the form *variable* = *expression*; and construct a tree for the statement. The statement is terminated by ';' but ';' does not appear in the tree. The tree will have a root node with data as '=', a node representing the *variable* as left child of root and the expression tree for the *expression* as its right subtree. For simplicity, assume single letter variables ($a - z$). The expressions are of the form given in Q1 of Assignment 8.

   Write a function CreateAssignmentTree(S) which creates a tree for the given assignment statement S and returns a pointer to the root of the tree. Program should then print the inorder traversal of the tree.

   NOTE : In the design document, you need to write the pseudocode for the function CreateAssignmentTree(s) only. You should invoke the required functions written as part of assignment 8 (no need to define these functions again).

   Input format:
   The input is an assignment statement read from terminal.

   Output format:
   The output is the inorder traversal of the tree.

   Sample Input 1:
   x=a+b*c;
   Sample Output 1:
   x=a+b*c

   Sample Input 2:
   x=(a+b);
   Sample Output 2:
   x=a+b

   Sample Input 3:
   y=y;
   Sample Output 3:
   y=y

   Sample Input 4:
   z=(x+y)*(a+b);
   Sample Output 4:
   z=x+y*a+b

2. Modify the above question to read input from a file. The file can contain more than one assignment statements. The program should convert each statement into a tree and print its inorder traversal.