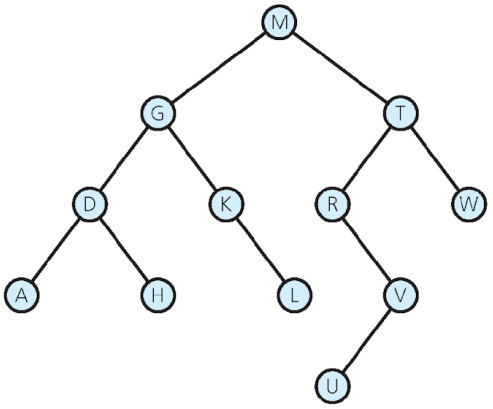
Data Structure and Advanced Programming

Homework #8
Due: 2021/5/11 08:00am (CST)

NOTE: Please upload your answers in either English or Chinese as a PDF to NTU COOL before the due date and time.

1. (35%) Binary trees could be used for representing an expression containing operands and binary operators. Create the binary trees representing the following equations (^ stands for exponentiation):
   a. a + b / c
   b. (a + b) * c
   c. a + (b - c) * d ^ (e - f)

2. (15%) Consider the binary tree shown as the right figure. What note or nodes are:
   a. The tree's root?
   b. Parents of G and T?
   c. Children of the node G?
   d. Siblings of node T?
   e. Ancestors of U?
   f. Descendants of A?
   g. Leaves?



3. (15%) What are the preorder, inorder, and postorder traversals of the binary tree shown in the right figure? Write the sequence of nodes visited in the traversals of the tree, respectively.

4. (35%) Beginning with an empty binary search tree, what binary search tree is formed when you insert the following values in the order given? A C F I L P S. Please show the tree results after each insertion.