Sheet 2
Stack - Tree

1 Question 1

Convert the following infix expressions to prefix and postfix form. Then, evaluate the postfix expressions of each one using a stack. Draw the intermediate states of the stack.

a) (2-3+4)*(5+6*7)

b) 2-3+4-5*6

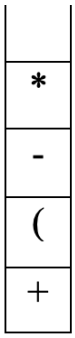
c) ((H*((((A+((B+C)*D))*F)*G)*E))+J)

d) 2*3 + 4*5

e) (A*(B*(((C+A)+B)*C)))

2 Question 2

Consider the infix-to-postfix algorithm using a single stack. Suppose at a certain point in the algorithm, the states of the operator stack is as following, postfix string output so far is **"a b - c d e"**, and the remaining input is **"+ f) / g".**

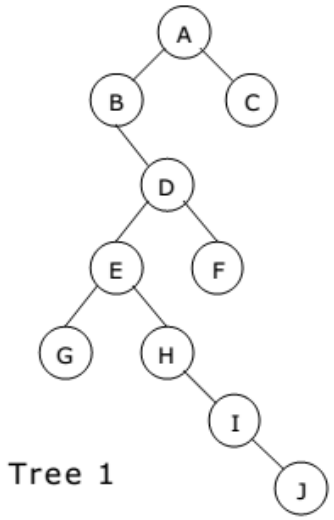


Operator stack

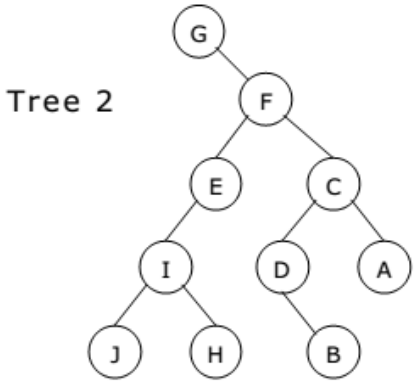
What are the **input infix expression** and the **final output postfix expression**?

3 Question 3

Write PreOrder, InOrder and PostOrder traversals of the following trees.



Tree 1



Tree 2

4 Question 4

For the infix expression (60 – 40) * 3 / 2 + 68 % (3 + 10) + 5.

a) Draw an expression tree to represent this expression

b) What is the postfix expression represented by the tree?

c) What is the prefix expression represented by the tree?

d) Use the tree to evaluate the expression and verify the answer using the infix expression.

5 Notes

- You are required to submit a PDF of your answers and your ID in teams before 11:59 pm.
- You are encouraged to ask any questions on teams, or in person.

Good Luck