

Part 2

The data structure that I will use when implementing is called reference-based binary tree.

The Node struct will have three node pointers, which will point to the parent and the two children, as well as the value that is held in the node. This value, which will be an operand or an operator, will be stored as a string.

Given the post fix expression, the algorithm to create the tree is as follows:

First take the rightmost item, which is an operator, and create the root of the tree with it.

Then keep scanning the items from right to left:

Get the next item:

If it is an operator then make it the right child and so on and so forth as we traverse leftward until we reach an operand which will be the left child,

Then as we traverse leftward after reaching an operand, we climb up the tree filling in the left children with operands until we reach the root again and begin the same process in the other direction

Then, we must create a pre-order recursive method to evaluate the tree.

Input: the root node

-Base case: return the node value

-Traverse by recursively calling the function

If(node has children)

Recursive call: evaluate(node.left)

Recursive call: evaluate(node.right)