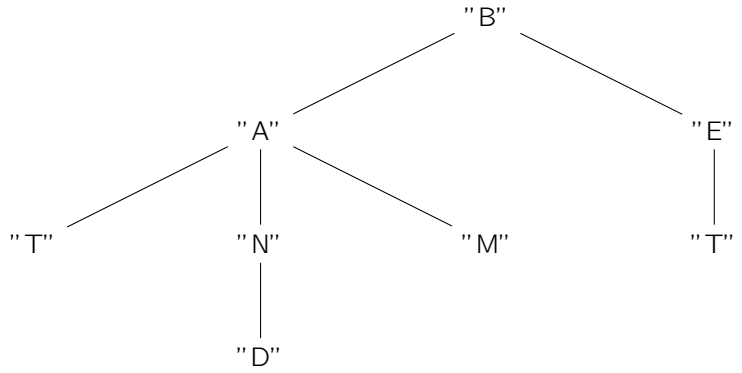
Small Group Problems - Trees

Problem A (Groups 1 and 2)

Write a program that uses `Tree` and `Node` and creates a tree that corresponds to the following tree.



Problem B (Groups 3 and 4)

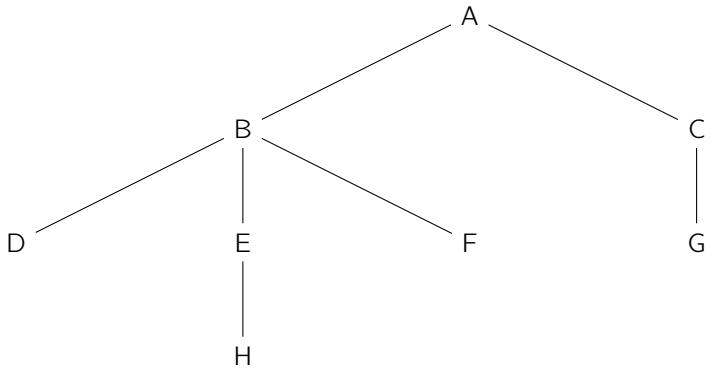
Descendant: any node that can be reached by traversing down the tree from a given node.

This method prints the values of the descendants of a given node. Find the error in this code and correct it.

```
class Node:
    def printChildren(self):
        print(self.value)
        for child in self.children:
            child.printChildren()
```

Problem C (Groups 5 and 6)

Write a method that traverses a tree and prints the values of the nodes. For the following tree, the expected output is: D, H, E, F, B, G, C, A.




```
class Tree:
    def printTree(self):
        self.root.printNode()

class Node:
    def printNode(self):
        ...
```

Problem D (Groups 7 and 8)

What does this method do? Trace the code using an example.

```
class Node:
    def foo(self):
        if self is None:
            return -1
        if len(self.children) == 0:
            return 0

        max_height = 0

        for child in self.children:
            height = child.foo()
            if height > max_height:
                max_height = height

        return 1 + max_height
```