

### 590. N-ary Tree Postorder Traversal

We could use dfs to traverse all nodes. TC is  $O(n)$

class Solution:

```
def postorder(self, root: 'Node') -> List[int]:
```

```
    res = []
```

```
    def traverse(node, res):
```

```
        for i in node.children:
```

```
            traverse(i, res)
```

```
        res.append(node.val)
```

```
    if not root:
```

```
        return []
```

```
    traverse(root, res)
```

```
    return res
```

### 100. Same Tree

We will use dfs to traverse all nodes and return False directly if any two nodes don't match. TC is  $O(n)$

class Solution:

```
def isSameTree(self, p: TreeNode, q: TreeNode) -> bool:
```

```
    if p and q:
```

```
        if p.val == q.val:
```

```
            if not self.isSameTree(p.left, q.left):
```

```
                return False
```

```
            if not self.isSameTree(p.right, q.right):
```

```
                return False
```

```
            return True
```

```
        return False
```

```
    elif p or q:
```

```
        return False
```

```
    else:
```

```
        return True
```

### 101. Symmetric Tree

We will use recursion to traverse all nodes symmetrically. Return False if any two nodes are not equal. TC is  $O(n)$ . SC is  $O(\log n)$

class Solution:

```
def isSymmetric(self, root: TreeNode) -> bool:
```

```
    if not root:
```

```
        return True
```

```
    return self.isMirror(root.left, root.right)
```

```
def isMirror(self, left, right):
```

```

if not left and not right:
    return True
if not left or not right:
    return False

if left.val == right.val:
    return self.isMirror(left.left, right.right) and self.isMirror(left.right, right.left)
else:
    return False

```

#### 104. Maximum Depth of Binary Tree

We will use recursion to get maximum depth of left and right branches. TC is  $O(n)$

class Solution:

```

def maxDepth(self, root: TreeNode) -> int:
    if not root:
        return 0

    left = self.maxDepth(root.left)
    right = self.maxDepth(root.right)
    return max(left, right) + 1

```

#### 110. Balanced Binary Tree

We will use recursion to check every node's left branch tree level and right branch tree level to check whether it's a balanced binary tree. TC is  $O(n)$

class Solution:

```

def isBalanced(self, root: TreeNode) -> bool:
    def traverse(node):
        if not node:
            return 0
        left = traverse(node.left)
        right = traverse(node.right)
        if left is False or right is False:
            return False
        if abs(left - right) > 1:
            return False
        return max(left, right) + 1

    if traverse(root) is False:
        return False
    return True

```