Problem 1028: Recover a Tree From Preorder Traversal

Problem Information

Difficulty: Hard
Acceptance Rate: 83.24%
Paid Only: No
Tags: String, Tree, Depth-First Search, Binary Tree

Problem Description

We run a preorder depth-first search (DFS) on the `root` of a binary tree.

At each node in this traversal, we output `D` dashes (where `D` is the depth of this node), then we output the value of this node. If the depth of a node is `D`, the depth of its immediate child is `D + 1`. The depth of the `root` node is `0`.

If a node has only one child, that child is guaranteed to be **the left child**.

Given the output `traversal` of this traversal, recover the tree and return _its_ `root`.

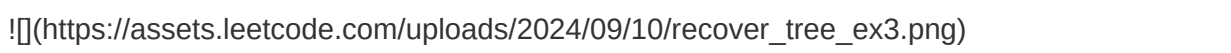
Example 1:

Input: traversal = "1-2--3--4-5--6--7" **Output:** [1,2,5,3,4,6,7]

Example 2:

Input: traversal = "1-2--3---4-5--6---7" **Output:** [1,2,5,3,null,6,null,4,null,7]

Example 3:



Input: traversal = "1-401--349---90--88" **Output:** [1,401,null,349,88,90]

Constraints:

* The number of nodes in the original tree is in the range `[1, 1000]`. * `1 <= Node.val <= 109`

Code Snippets

C++:

```
/**
* Definition for a binary tree node.
* struct TreeNode {
* int val;
* TreeNode *left;
* TreeNode *right;
* TreeNode() : val(0), left(nullptr), right(nullptr) {}
* TreeNode(int x) : val(x), left(nullptr), right(nullptr) {}
* TreeNode(int x, TreeNode *left, TreeNode *right) : val(x), left(left),
right(right) {}
* };
*/
class Solution {
public:
TreeNode* recoverFromPreorder(string traversal) {

}
};
```

Java:

```
/**
* Definition for a binary tree node.
* public class TreeNode {
* int val;
* TreeNode left;
* TreeNode right;
* TreeNode() {}
* TreeNode(int val) { this.val = val; }
```

```
* TreeNode(int val, TreeNode left, TreeNode right) {
* this.val = val;
* this.left = left;
* this.right = right;
* }
* }
*/
class Solution {
public TreeNode recoverFromPreorder(String traversal) {

}
}
```

Python3:

```
# Definition for a binary tree node.
# class TreeNode:
# def __init__(self, val=0, left=None, right=None):
# self.val = val
# self.left = left
# self.right = right
class Solution:
def recoverFromPreorder(self, traversal: str) -> Optional[TreeNode]:
```