

## 331. Verify Preorder Serialization

Medium



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Fav

One way to serialize a binary tree is to use a preorder traversal. In this traversal, record the node's value. If it is a null node, record the value #.



For example, the above binary tree can be serialized to "9,3,2,4,1,#,6,#,#,1,#,#,6,#,#" where # represents a null node.

Given a string of comma separated values representing the preorder traversal of a binary tree. Find an algorithm without using extra space.

Each comma separated value in the string represents an integer value or `null` pointer.

You may assume that the input format is correct and does not contain consecutive commas such as `"1,,3"`.

## Example 1:

**Input:** "9,3,4,#,#,1,#,#,2,#,6,#,#"  
**Output:** true

```
1 package Algorithm;
2 /*
3  * 一个可以恢复二叉树的字符串=根结点+左子树的字符串+右子树的字符串
4  */
5 public class L331 {
6
7     class pointer {
8         int val = 0;
9     }
10
11     public boolean helper(String [] pre, pointer p) {
12         if(p.val > pre.length - 1) return false;
13         //遇到空节点就返回，代表子树结束
14         if(pre[p.val].equals("#")) {
15             p.val++;
16             return true;
17         } else {
18             p.val++;
19             //递归的顺序是先第一个helper，然后才是后面那个helper，第一个helper是左子树递归，第二个是右子树递归。
20             return helper(pre, p) && helper(pre, p);
21         }
22     }
23
24     public boolean isValidSerialization(String preorder) {
25         if(preorder == null) return false;
26         String [] pre = preorder.split(",");
27         pointer p = new pointer();
28         //看最后的p.val是不是为pre.length
29         return helper(pre, p) && p.val == pre.length;
30     }
31 }
32
```

