1485. Clone Binary Tree With Random Pointer

Medium 208 37 Add to List Share

A binary tree is given such that each node contains an additional random pointer which could point to any node in the tree or null.

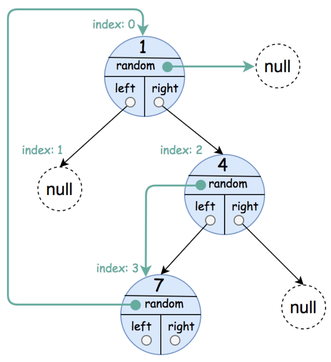
Return a deep copy of the tree.

The tree is represented in the same input/output way as normal binary trees where each node is represented as a pair of `[val, random_index]` where:

- `val`: an integer representing `Node.val`
- `random_index`: the index of the node (in the input) where the random pointer points to, or `null` if it does not point to any node.

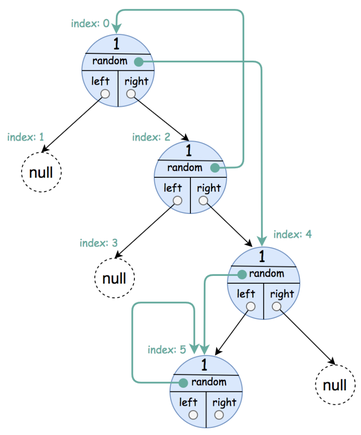
You will be given the tree in class `Node` and you should return the cloned tree in class `NodeCopy`. `NodeCopy` class is just a clone of `Node` class with the same attributes and constructors.

Example 1:



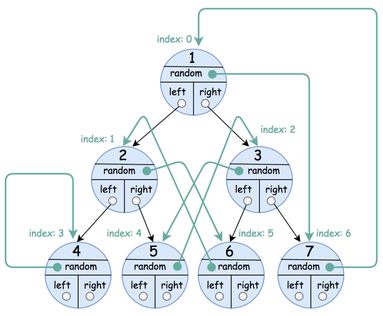

```
Input: root = [[1,null],null,[4,3],[7,0]]
Output: [[1,null],null,[4,3],[7,0]]
Explanation: The original binary tree is [1,null,4,7].
The random pointer of node one is null, so it is represented as [1, null].
The random pointer of node 4 is node 7, so it is represented as [4, 3] where 3 is the index of node 7 in the array representing the tree.
The random pointer of node 7 is node 1, so it is represented as [7, 0] where 0 is the index of node 1 in the array representing the tree.
```

Example 2:




```
Input: root = [[1,4],null,[1,0],null,[1,5],[1,5]]
Output: [[1,4],null,[1,0],null,[1,5],[1,5]]
Explanation: The random pointer of a node can be the node itself.
```

Example 3:




```
Input: root = [[1,6],[2,5],[3,4],[4,3],[5,2],[6,1],[7,0]]
Output: [[1,6],[2,5],[3,4],[4,3],[5,2],[6,1],[7,0]]
```

Example 4:

```
Input: root = []
Output: []
```

Example 5:

```
Input: root = [[1,null],null,[2,null],null,[1,null]]
Output: [[1,null],null,[2,null],null,[1,null]]
```

Constraints:

- The number of nodes in the `tree` is in the range `[0, 1000]`.
- Each node's value is between `[1, 10^6]`.

Accepted 12,164 | Submissions 15,337

Seen this question in a real interview before? Yes No

Companies

0 ~ 6 months 6 months ~ 1 year 1 year ~ 2 years

Facebook | 2

Related Topics

Hash Table Tree Depth-First Search Breadth-First Search Binary Tree

Similar Questions

Clone Graph	Medium
Copy List with Random Pointer	Medium
Clone N-ary Tree	Medium

Hide Hint 1

Traverse the tree, keep a hashtable with you and create a nodecopy for each node in the tree.

Hide Hint 2

Start traversing the original tree again and connect the left, right and random pointers in the cloned tree the same way as the original tree with the help of the hashtable.

Java | Autocomplete

```java
class Solution {
    public NodeCopy copyRandomBinaryTree(Node root) {
        if (root == null) {
            return null;
        }

        // Step 1. Create a copy of each node
        Map<Node, NodeCopy> copy = new HashMap<>();
        Stack<Node> stack = new Stack<>();
        stack.push(root);

        while (!stack.isEmpty()) {
            Node node = stack.pop();
            NodeCopy copyNode = new NodeCopy(node.val);
            copy.put(node, copyNode);

            if (node.left != null) {
                stack.push(node.left);
            }
            if (node.right != null) {
                stack.push(node.right);
            }
        }

        // Step 2. Connect the copied nodes together
        stack.push(root);
        while (!stack.isEmpty()) {
            Node node = stack.pop();

            if (node.left != null) {
                copy.get(node).left = copy.get(node.left);
                stack.push(node.left);
            }
            if (node.right != null) {
                copy.get(node).right = copy.get(node.right);
                stack.push(node.right);
            }
            if (node.random != null) {
                copy.get(node).random = copy.get(node.random);
            }
        }

        return copy.get(root);
    }
```