337. House Robber III

Description | Hints | Submissions | Discuss | Solution

Pick One

The thief has found himself a new place for his thievery again. There is only one entrance to this area, called the "root." Besides the root, each house has one and only one parent house. After a tour, the smart thief realized that "all houses in this place forms a binary tree". It will automatically contact the police if two directly-linked houses were broken into on the same night.

Determine the maximum amount of money the thief can rob tonight without alerting the police.

Example 1:

```
Input: [3,2,3,null,3,null,1]

     3
    / \
   2   3
    \   \
     3   1

Output: 7
Explanation: Maximum amount of money the thief can rob = 3 + 3 + 1 = 7.
```

Example 2:

```
Input: [3,4,5,1,3,null,1]

     3
    / \
   4   5
  / \   \
 1   3   1

Output: 9
Explanation: Maximum amount of money the thief can rob = 4 + 5 = 9.
```

```java
public class L337 {
    public class TreeNode {
        int val;
        TreeNode left;
        TreeNode right;

        TreeNode(int x) {
            val = x;
        }
    }
    /*
     * 这是一个动态规划的题目，分为偷不偷当前节点。
     */
      public int rob(TreeNode root) {
          int [] res = dfs(root);
          return Math.max(res[0], res[1]);
      }

      private int [] dfs(TreeNode root){
          int [] dp = new int [2];
          if(root == null)
              return dp;

          int [] left = dfs(root.left);
          int [] right = dfs(root.right);
          //dp[0]表示偷root的，那么左右不能偷，所以用left[1]，right[1],left[1]表示不偷左子树的根
          dp[0] = left[1] + right[1] + root.val;
          //dp[1]表示不偷root的，那么左右偷不偷都可以，取最大值。
          dp[1] = Math.max(left[0], left[1]) + Math.max(right[0], right[1]);
          return dp;
      }
}
```