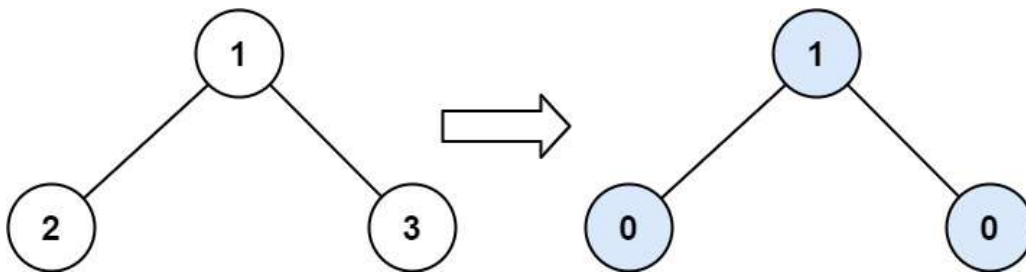


563. Binary Tree Tilt

Given the root of a binary tree, return the sum of every tree node's tilt.

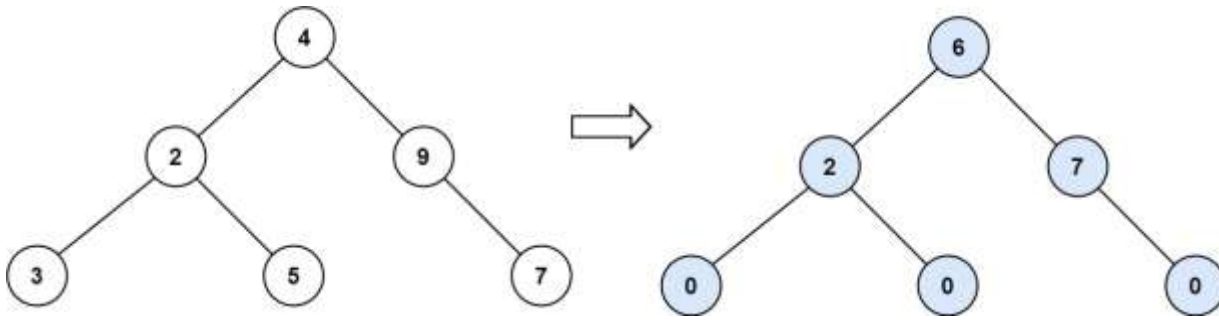
The tilt of a tree node is the absolute difference between the sum of all left subtree node values and all right subtree node values. If a node does not have a left child, then the sum of the left subtree node values is treated as 0. The rule is similar if the node does not have a right child.

Example 1:



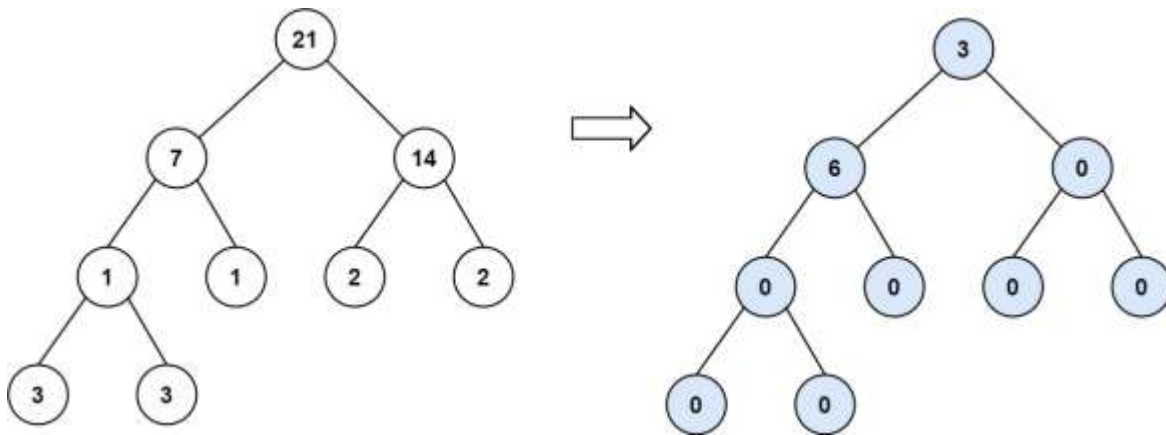
- **Input:** root = [1,2,3]
- **Output:** 1
- **Explanation:**
 - **Tilt of node 2 :** $|0-0| = 0$ (no children)
 - **Tilt of node 3 :** $|0-0| = 0$ (no children)
 - **Tilt of node 1 :** $|2-3| = 1$ (left subtree is just left child, so sum is 2; right subtree is just right child, so sum is 3)
 - **Sum of every tilt :** $0 + 0 + 1 = 1$

Example 2:



- **Input:** root = [4,2,9,3,5,null,7]
- **Output:** 15
- **Explanation:**
 - **Tilt of node 3 :** $|0-0| = 0$ (no children)
 - **Tilt of node 5 :** $|0-0| = 0$ (no children)
 - **Tilt of node 7 :** $|0-0| = 0$ (no children)
 - **Tilt of node 2 :** $|3-5| = 2$ (left subtree is just left child, so sum is 3; right subtree is just right child, so sum is 5)
 - **Tilt of node 9 :** $|0-7| = 7$ (no left child, so sum is 0; right subtree is just right child, so sum is 7)
 - **Tilt of node 4 :** $|(3+5+2)-(9+7)| = |10-16| = 6$ (left subtree values are 3, 5, and 2, which sums to 10; right subtree values are 9 and 7, which sums to 16)
 - **Sum of every tilt :** $0 + 0 + 0 + 2 + 7 + 6 = 15$

Example 3:



- **Input:** root = [21,7,14,1,1,2,2,3,3]
- **Output:** 9

Constraints:

- The number of nodes in the tree is in the range $[0, 10^4]$.
- $-1000 \leq \text{Node.val} \leq 1000$