Minimum Number of Operations to Sort a Binary Tree by Level

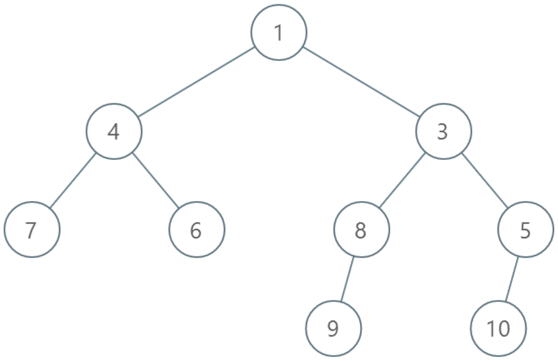
You are given the root of a binary tree with **unique values**.

In one operation, you can choose any two nodes **at the same level** and swap their values.

Return *the minimum number of operations needed to make the values at each level sorted in a* ***strictly increasing order***.

The **level** of a node is the number of edges along the path between it and the root node.

Example 1:



Input: root = [1,4,3,7,6,8,5,null,null,null,null,9,null,10]

Output: 3

Explanation:

- Swap 4 and 3. The 2nd level becomes [3,4].

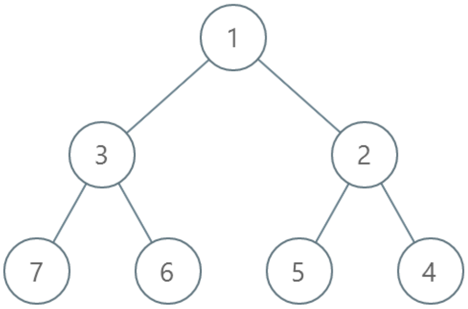
- Swap 7 and 5. The 3rd level becomes [5,6,8,7].

- Swap 8 and 7. The 3rd level becomes [5,6,7,8].

We used 3 operations so return 3.

It can be proven that 3 is the minimum number of operations needed.

Example 2:



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

Output: 3

Explanation:

- Swap 3 and 2. The 2nd level becomes [2,3].

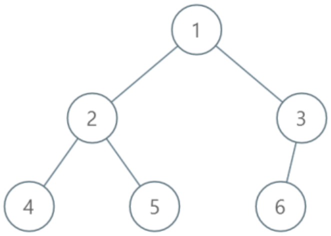
- Swap 7 and 4. The 3rd level becomes [4,6,5,7].

- Swap 6 and 5. The 3rd level becomes [4,5,6,7].

We used 3 operations so return 3.

It can be proven that 3 is the minimum number of operations needed.

Example 3:



Input: root = [1,2,3,4,5,6]

Output: 0

Explanation: Each level is already sorted in increasing order so return 0.

Constraints:

- The number of nodes in the tree is in the range [1, 10^5].
- 1 <= Node.val <= 10^5
- All the values of the tree are **unique**.