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662. Maximum Width of Binary Tree

Medium

4219

686

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Given the `root` of a binary tree, return *the maximum width of the given tree*.

The **maximum width** of a tree is the maximum **width** among all levels.

The **width** of one **level** is defined as the length between the end-nodes (the **leftmost** and **rightmost** non-null nodes), where the null nodes between the end-nodes are **also** counted into the **length** calculation.

It is **guaranteed** that the answer will in the range of **32-bit** signed integer.

Example 1:



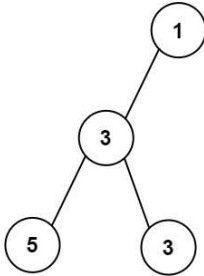
```
graph TD
    1((1)) --- 3L((3))
    1 --- 2((2))
    3L --- 5((5))
    3L --- 3R((3))
    2 --- 9((9))
```

Input: `root = [1,3,2,5,3,null,9]`

Output: 4

Explanation: The maximum width existing in the third level with the length 4 (5,3,null,9).

Example 2:



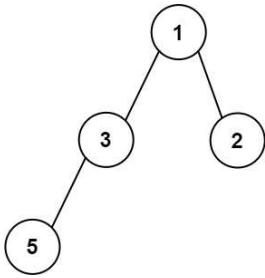
```
graph TD
    1((1)) --- 3((3))
    3 --- 5((5))
    3 --- 3R((3))
```

Input: `root = [1,3,null,5,3]`

Output: 2

Explanation: The maximum width existing in the third level with the length 2 (5,3).

Example 3:



```
graph TD
    1((1)) --- 3((3))
    1 --- 2((2))
    3 --- 5((5))
```

Input: `root = [1,3,2,5]`

Output: 2

Explanation: The maximum width existing in the second level with the length 2 (3,2).

Constraints:

- The number of nodes in the tree is in the range `[1, 3000]`.
- `-100 <= Node.val <= 100`

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/**

2

* Definition for a binary tree node.

3

* public class TreeNode {

4

* int val;

5

* TreeNode left;

6

* TreeNode right;

7

* TreeNode() {}

8

* TreeNode(int val) { this.val = val; }

9

* TreeNode(int val, TreeNode left, TreeNode right) {

10

* this.val = val;

11

* this.left = left;

12

* this.right = right;

13

* }

14

* }

15

*/

16

class Solution {

17

public int widthOfBinaryTree(TreeNode root) {

18

}

19

}

20

}

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