543. Diameter of Binary Tree

Description | Hints | Submissions | Discuss | Solution

Pick One

Given a binary tree, you need to compute the length of the diameter of the tree. The diameter of a binary tree is the length of the **longest** path between any two nodes in a tree. This path may or may not pass through the root.

Example:
Given a binary tree

```
          1
         / \
        2   3
       / \
      4   5
```

Return **3**, which is the length of the path [4,2,1,3] or [5,2,1,3].

Note: The length of path between two nodes is represented by the number of edges between them.

- 二叉树的直径：二叉树中从一个结点到另一个节点**最长**的路径，叫做二叉树的直径
- 采用分治和递归的思想：根节点为root的二叉树的直径 = Max(左子树直径，右子树直径，左子树的最大深度（不包括根节点）+右子树的最大深度（不包括根节点）+1)

```java
public class L543 {
    public class TreeNode {
              int val;
              TreeNode left;
              TreeNode right;
              TreeNode(int x) { val = x; }
          }

       int diameter = 0;
      public int diameterOfBinaryTree(TreeNode root) {
            getDepth(root);
            return diameter;
        }
        public int getDepth(TreeNode root){
            if (root == null)
                return -1;
            int left = getDepth(root.left);
            int right = getDepth(root.right);
            int temp = left + right + 2;
            if (temp > diameter)
                diameter = temp;
            return Math.max(left, right) + 1;
        }
    //只有一个根节点时，它的直径为0
        public static void main(String [] args) {
            TreeNode root = new L543().new TreeNode(0);
            root.left = null;
            root.right = null;
            System.out.println(new L543().diameterOfBinaryTree(root));
        }
}
```