



链滴

[每日 LeetCode] 543. Diameter of Binary Tree

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原文链接: <https://ld246.com/article/1560608444892>

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原文链接 <https://leetcode.com/forward?goto=https%3A%2F%2Fwww.tuhaoxin.cn%2Farticles%2F2019%2F06%2F15%2F1560608390069.html> target="_blank" rel="nofollow ugc">[每日 LeetCode] 543. Diameter of Binary Tree

Description:

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.

思路：本题要求二叉树的直径，这里的直径理解为在二叉树中，任意两个节点间最长的路径长度。本题的逻辑不是很好理解，首先需要考虑最长路径可能没有经过根节点，因此需要考虑以下两个方面问题：

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- 最长路径经过根节点：那么根节点的左子树的深度和右子树的深度相加就是我们的结果

- 最长路径没有经过根节点：这个问题就分为两个子问题，分别设置新的根节点为其左子节点和右节点，然后重复步骤 1

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C++ 代码

```
/**
 * Definition for a binary tree node.
 * struct TreeNode {
 *     int val;
 *     TreeNode *left;
 *     TreeNode *right;
 *     TreeNode(int x) : val(x), left(NULL), right(NULL) {}
 * };
 */
class Solution {
public:
    int diameterOfBinaryTree(TreeNode* root) {
        int d = 1;
        diameter(root, d);
        return d - 1;
    }
};
```

```
</span></span><span class="highlight-line"><span class="highlight-cl"> int diameter(Tr
eNode *root, int & d){
</span></span><span class="highlight-line"><span class="highlight-cl">     if(!root) retur
0;
</span></span><span class="highlight-line"><span class="highlight-cl">     int left = dia
eter(root-&right, d);
</span></span><span class="highlight-line"><span class="highlight-cl">     int right = di
meter(root-&left, d);
</span></span><span class="highlight-line"><span class="highlight-cl">     d = max(d, le
t + right + 1);
</span></span><span class="highlight-line"><span class="highlight-cl">     return max(le
t, right) + 1;
</span></span><span class="highlight-line"><span class="highlight-cl"> }
</span></span><span class="highlight-line"><span class="highlight-cl"> };
</span></span></code></pre>
<hr>
<p>运行时间: 8ms</p>
<p>运行内存: 20.1M</p>
```