Discover. Learn. Empower. ENGINEERING

WORKSHEET-6

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Branch: CSE

Section/Group: NTPP-603-B

Semester: 6th

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Subject Name: AP-2

Subject Code: 22CSP-351

Aim(i): 104. Given the root of a binary tree, return its maximum depth.
A binary tree's maximum depth is the number of nodes along the longest path from the root node down to the farthest leaf node.

Source Code:

```
class Solution {
public:
    int maxDepth(TreeNode* root) {
        if(root==nullptr){
            return 0;
        }
        int leftdepth=maxDepth(root->left);
        int rightdepth=maxDepth(root->right);

        return 1+max(leftdepth,rightdepth);
    }
};
```

OUTPUT:

Case 1 Case 2

Input

```
root =
[3,9,20,null,null,15,7]
```

Output

```
3
```

Expected

```
3
```

Accepted 86 / 86 testcases passed

ILB2SrjEs1 submitted at Feb 27, 2025 09:38

Editorial Solution

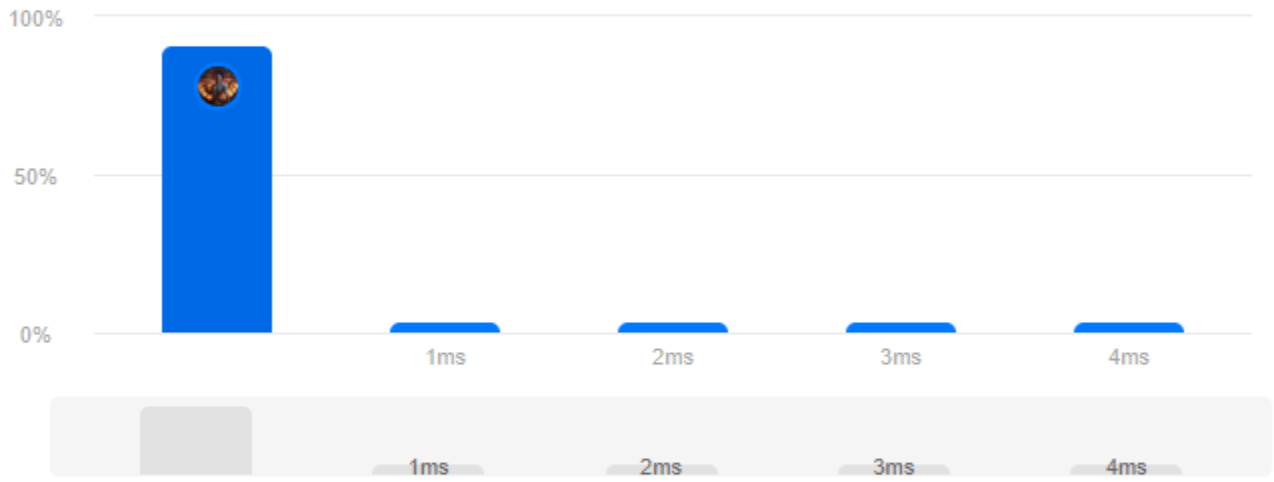
Runtime

0 ms | Beats 100.00%

Analyze Complexity

Memory

21.97 MB | Beats 47.88%



Code | C++

```
class Solution {

bool isPossible(TreeNode* root, long long l, long long r){
    if(root == nullptr)  return true;
    if(root->val < r and root->val > l)
        return isPossible(root->left, l, root->val) and
```

LEARNING OUTCOME:

1. We learnt about Depth og trees.
2. We learnt how to use null pointer.
3. We learnt how to use if else statement.

Aim(ii): 98. Given the root of a binary tree, determine if it is a valid binary search tree (BST).

A valid BST is defined as follows:

The left subtree of a node contains only nodes with keys less than the node's key.

The right subtree of a node contains only nodes with keys greater than the node's key.

Both the left and right subtrees must also be binary search trees.

You are given an API bool isBadVersion(version) which returns whether version is bad. Implement a function to find the first bad version. You should minimize the number of calls to the API.

Source Code:

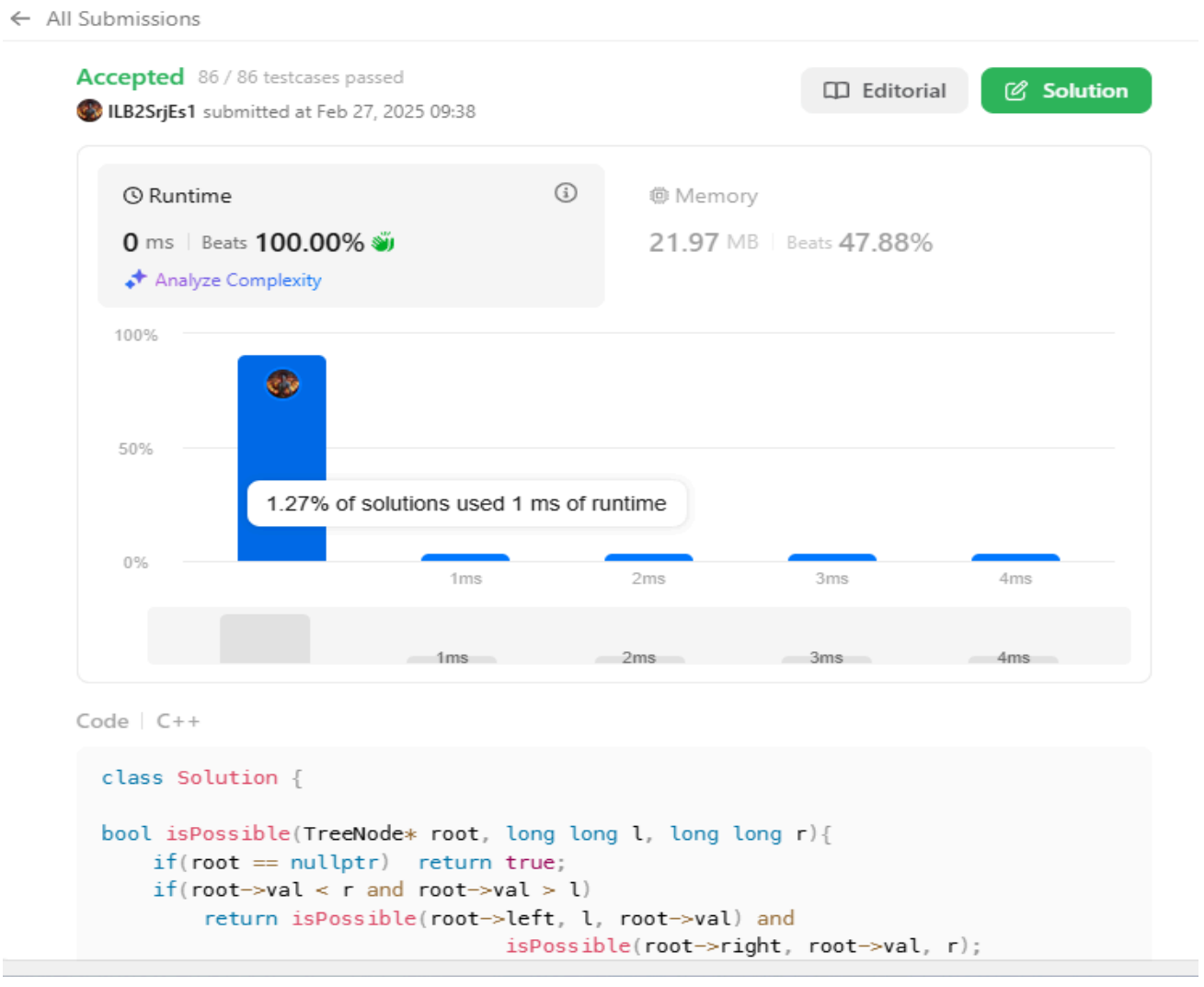
```
class Solution {

bool isPossible(TreeNode* root, long long l, long long r){
    if(root == nullptr)  return true;
    if(root->val < r and root->val > l)
        return isPossible(root->left, l, root->val) and
                                isPossible(root->right, root->val, r);
    else return false;
}

public:
    bool isValidBST(TreeNode* root) {
        long long int min = -1000000000000, max = 1000000000000;
        return isPossible(root, min, max);
    }
};
```

OUTPUT:


Testcase
Test Result
Case 1
Case 2
Input
root =
[2,1,3]
Output
true
Expected
true


All Submissions
Accepted
86 / 86 testcases passed
ILB2SrjEs1 submitted at Feb 27, 2025 09:38
Editorial
Solution
Runtime
0 ms | Beats 100.00%
Analyze Complexity
Memory
21.97 MB | Beats 47.88%
100%
50%
0%
1.27% of solutions used 1 ms of runtime
1ms
2ms
3ms
4ms
Code | C++
class Solution {
bool isPossible(TreeNode* root, long long l, long long r){
if(root == nullptr) return true;
if(root->val < r and root->val > l)
return isPossible(root->left, l, root->val) and
isPossible(root->right, root->val, r);

Learning Outcomes

1. We learnt how to use Long.
2. We learnt how to validate Binary search trees.

Aim(iii): 101**.** Given the root of a binary tree, check whether it is a mirror of itself (i.e., symmetric around its center).

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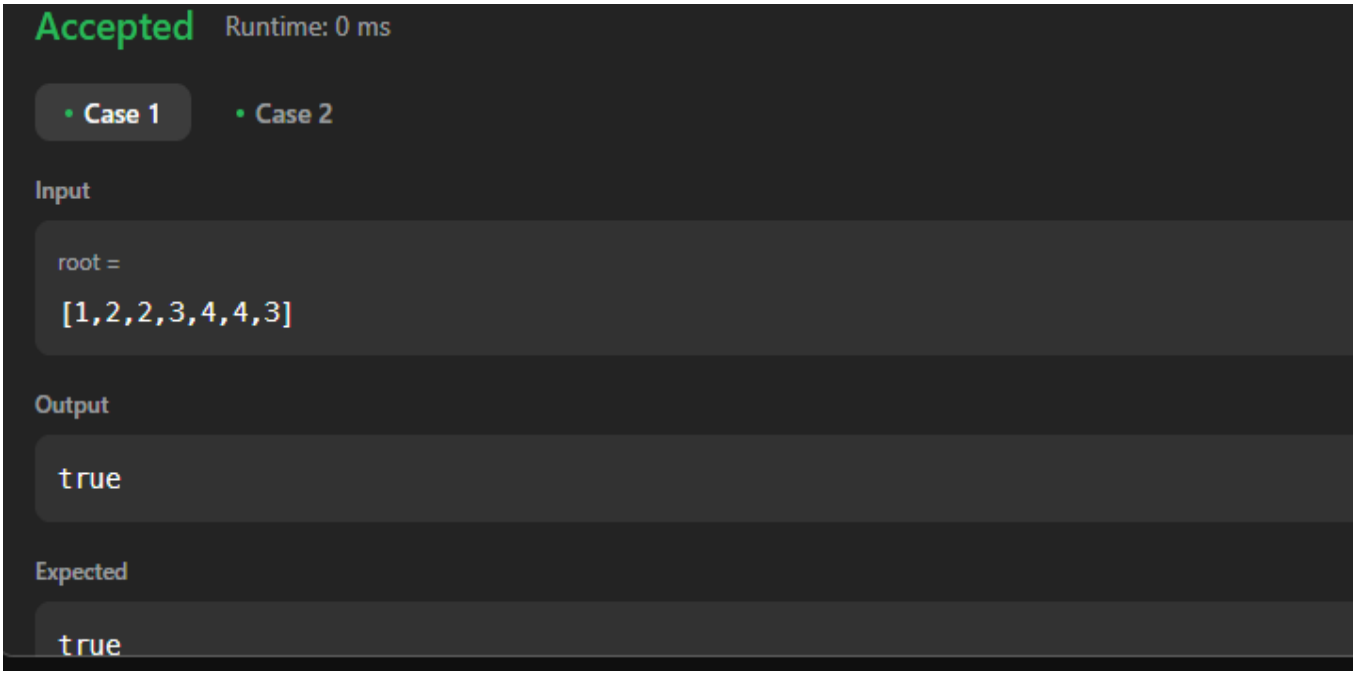
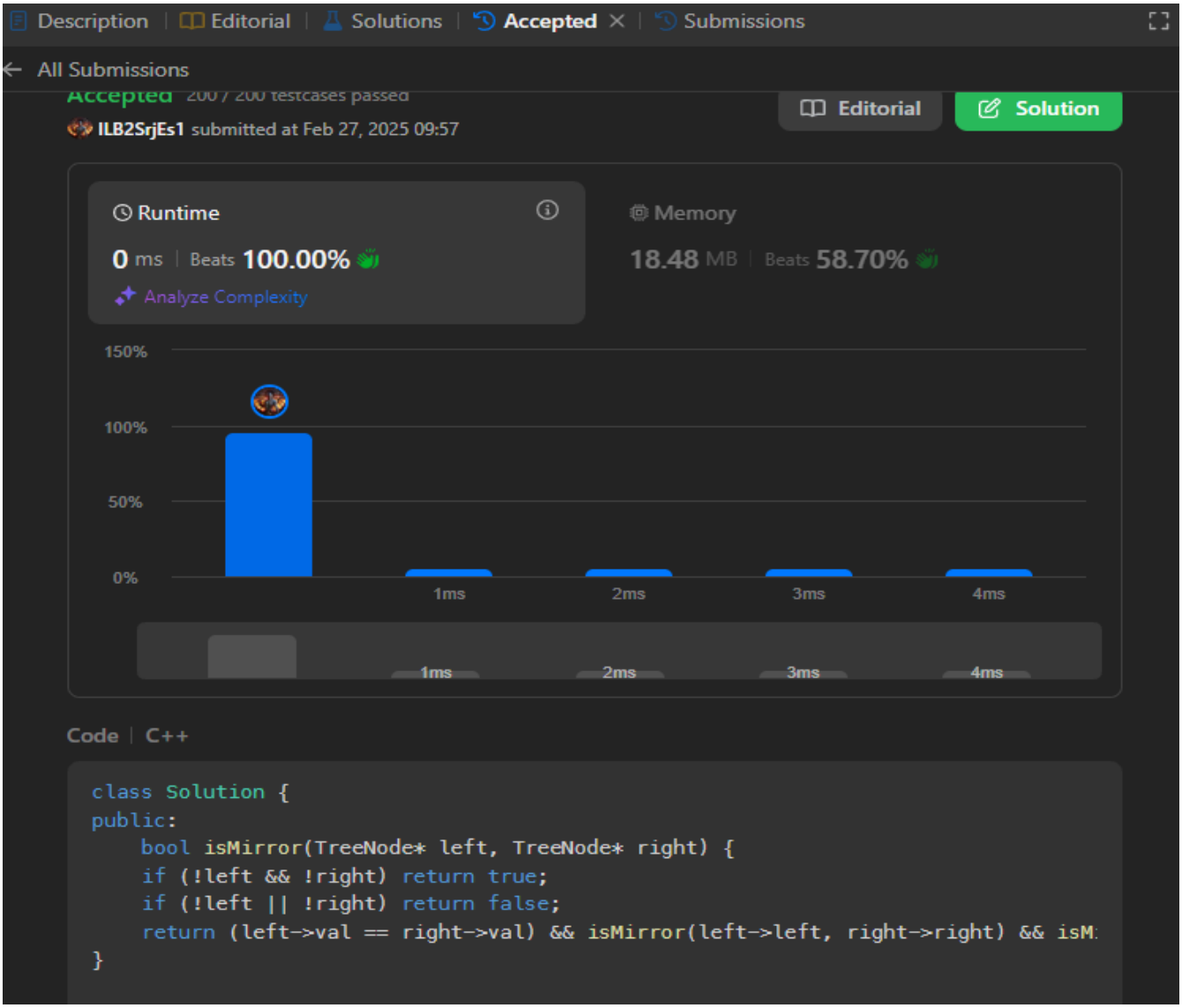
Source Code:

```
class Solution {
public:
    bool isMirror(TreeNode* left, TreeNode* right) {
    if (!left && !right) return true;
    if (!left || !right) return false;
    return (left->val == right->val) &&
isMirror(left->left, right->right) && isMirror(left->right,
right->left);
}

bool isSymmetric(TreeNode* root) {
    if (!root) return true;
    return isMirror(root->left, root->right);
}

};



};
```

OUTPUT:


Accepted
Runtime: 0 ms
Case 1
Case 2
Input
root =
[1,2,2,3,4,4,3]
Output
true
Expected
true


Description
Editorial
Solutions
Accepted
Submissions
All Submissions
Editorial
Solution
ILB2SrjEs1 submitted at Feb 27, 2025 09:57
Runtime
0 ms | Beats 100.00%
Analyze Complexity
Memory
18.48 MB | Beats 58.70%
150%
100%
50%
0%
1ms
2ms
3ms
4ms
Code | C++
class Solution {
public:
bool isMirror(TreeNode* left, TreeNode* right) {
if (!left && !right) return true;
if (!left || !right) return false;
return (left->val == right->val) && isMirror(left->left, right->right) && isM
}

Learning Outcomes

1. We learnt about Symmetric trees.
2. We learnt usage of Boolean.