EXPERIMENT 6

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SEMESTER: 6th **SUBJECT CODE: 22ITP – 351**

Problem 1

AIM: Maximum Depth of Binary Tree

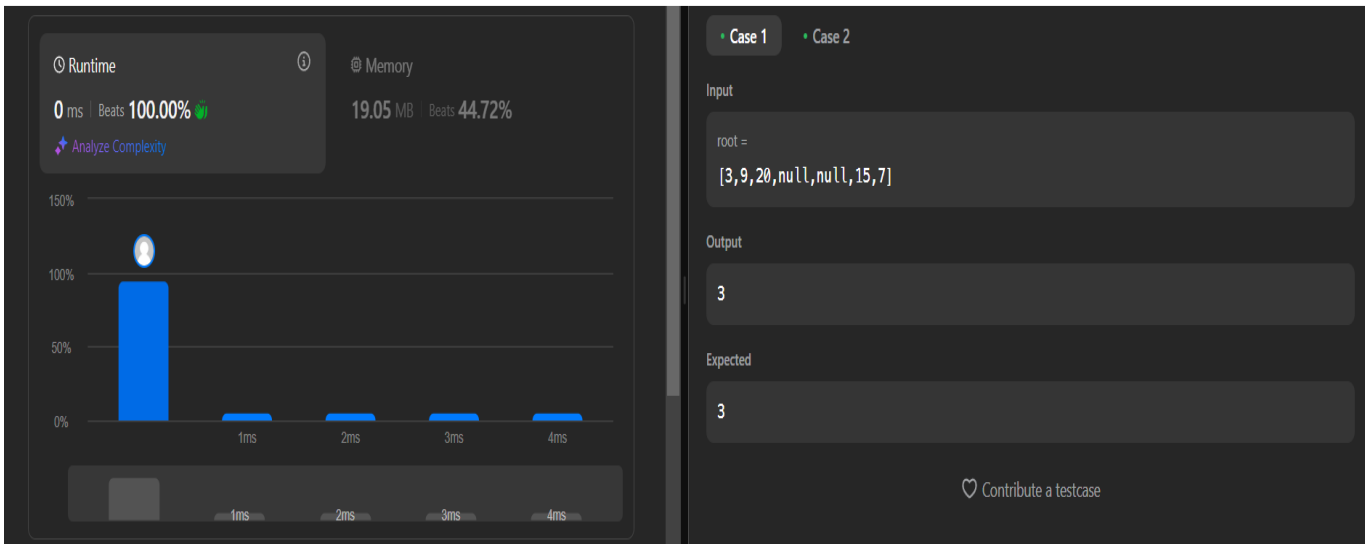
CODE:

```
class Solution {
public:
    int maxDepth(TreeNode* root) {
        if (!root) return 0;

        int leftDepth = maxDepth(root->left);
        int rightDepth = maxDepth(root->right);

        return max(leftDepth, rightDepth) + 1;
    }
};
```

OUTPUT:



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Problem 2

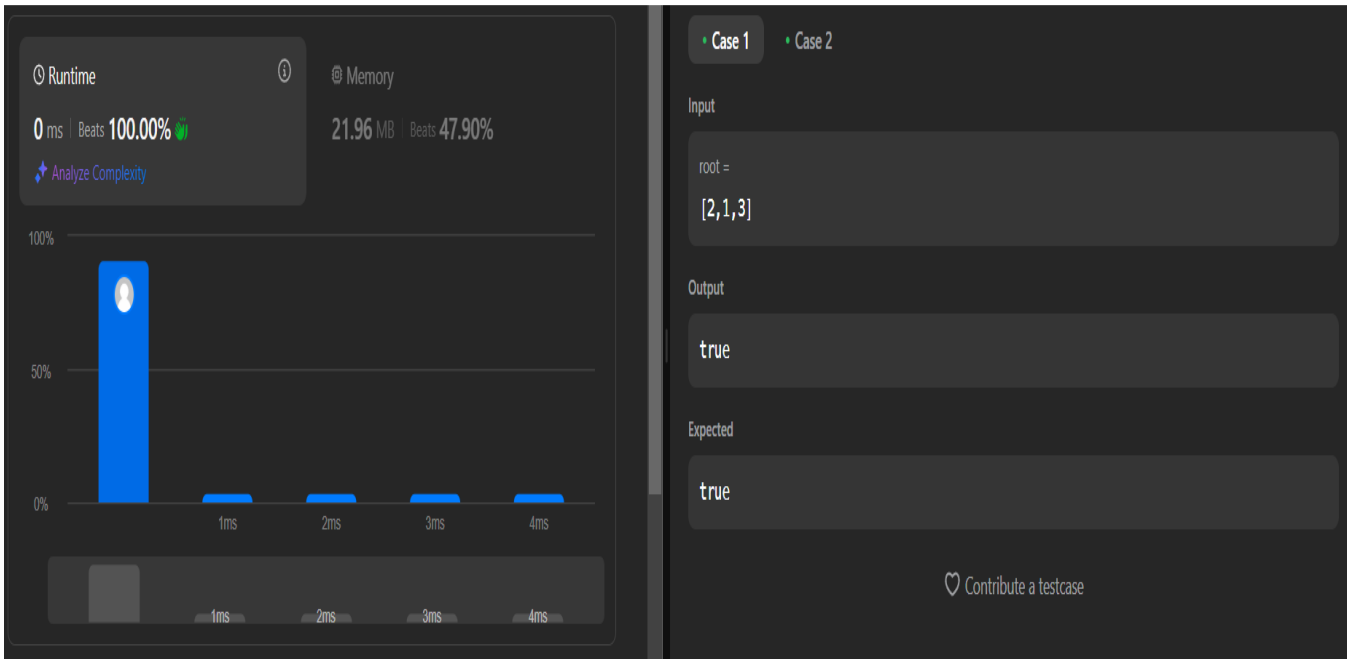
AIM: Validate Binary Search Tree

CODE:

```
class Solution {
public:
    bool isValidBST(TreeNode* root, long long minVal = LLONG_MIN, long long maxVal = LLONG_MAX) {
        if (!root) return true;
        if (root->val <= minVal || root->val >= maxVal) return false;

        return isValidBST(root->left, minVal, root->val) && isValidBST(root->right, root->val, maxVal);
    }
};
```

OUTPUT:



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Problem 3

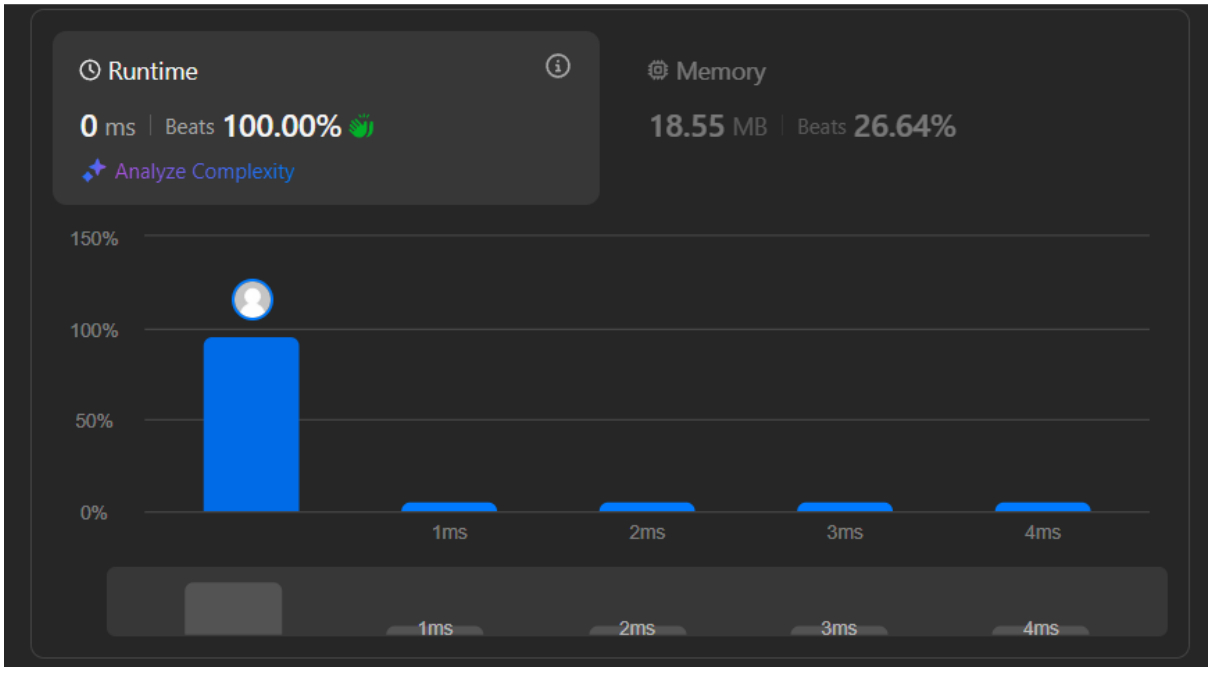
AIM: Symmetric Tree

CODE:

```
class Solution {
public:
    bool isMirrored(TreeNode* root1,TreeNode* root2){
        if(root1==NULL && root2==NULL)return true;
        else if(root1==NULL || root2==NULL)return false;

        return (root1->val==root2->val)&&isMirrored(root1->left,root2->right)&&isMirrored(root1->right,root2->left);
    }
    bool isSymmetric(TreeNode* root) {
        return isMirrored(root,root);
    }
};
```

OUTPUT:



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Problem 4

AIM: Binary Tree Level Order Traversal

CODE:

```
class Solution {
public:
    vector<vector<int>> levelOrder(TreeNode* root) {
        vector<vector<int>> result;
        if (!root) return result;

        queue<TreeNode*> q;
        q.push(root);

        while (!q.empty()) {
            int levelSize = q.size();
            vector<int> level;

            for (int i = 0; i < levelSize; ++i) {
                TreeNode* node = q.front();
                q.pop();
                level.push_back(node->val);

                if (node->left) q.push(node->left);
                if (node->right) q.push(node->right);
            }
            result.push_back(level);
        }

        return result;
    }
};
```

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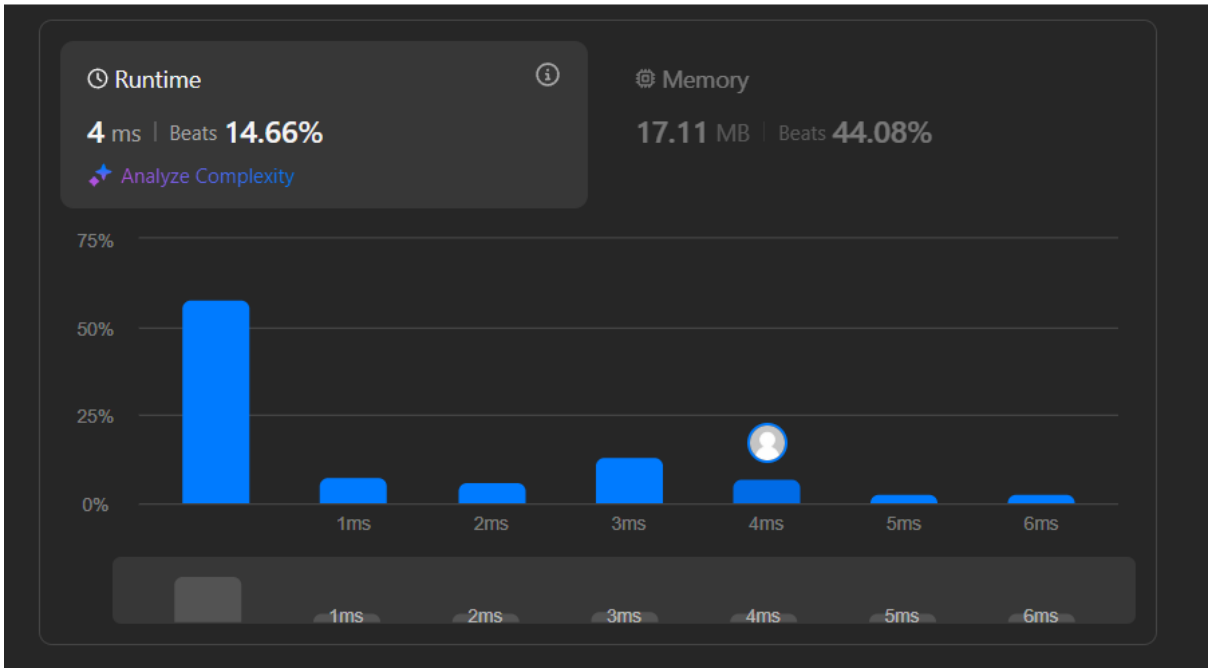
OUTPUT:



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Problem 5

AIM: Convert Sorted Array to Binary Search Tree

CODE:

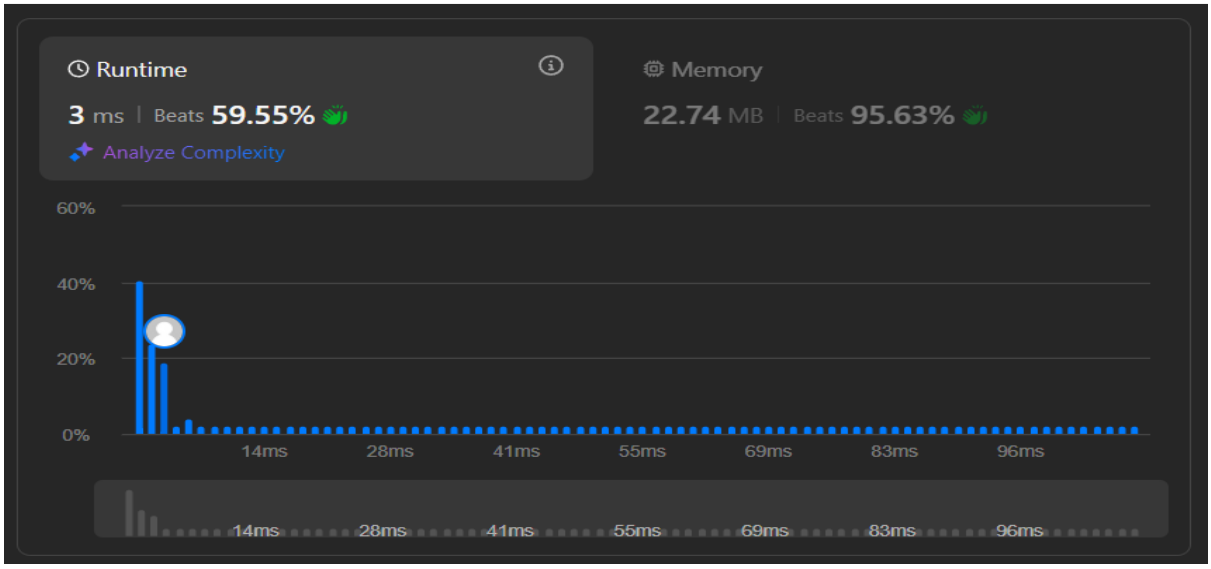
```
class Solution {
public:
    TreeNode* sortedArrayToBST(vector<int>& nums, int left, int right) {
        if (left > right) return nullptr;

        int mid = left + (right - left) / 2;
        TreeNode* node = new TreeNode(nums[mid]);
        node->left = sortedArrayToBST(nums, left, mid - 1);
        node->right = sortedArrayToBST(nums, mid + 1, right);

        return node;
    }

    TreeNode* sortedArrayToBST(vector<int>& nums) {
        return sortedArrayToBST(nums, 0, nums.size() - 1);
    }
};
```

OUTPUT:



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Problem 6

AIM: Binary Tree Inorder Traversal

CODE:

```
class Solution {
public:
    void inorderTraversalHelper(TreeNode* root, vector<int>& result) {
        if (!root) return;
        inorderTraversalHelper(root->left, result);
        result.push_back(root->val);
        inorderTraversalHelper(root->right, result);
    }

    vector<int> inorderTraversal(TreeNode* root) {
        vector<int> result;
        inorderTraversalHelper(root, result);
        return result;
    }
};
```

OUTPUT: