Assignment 6

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Section: IOT_637-B	**Subject: AP Lab II**

108. Convert Sorted Array to Binary Search Tree

Aim: Given an integer array nums where the elements are sorted in ascending order, convert it to a height-balanced binary search tree.

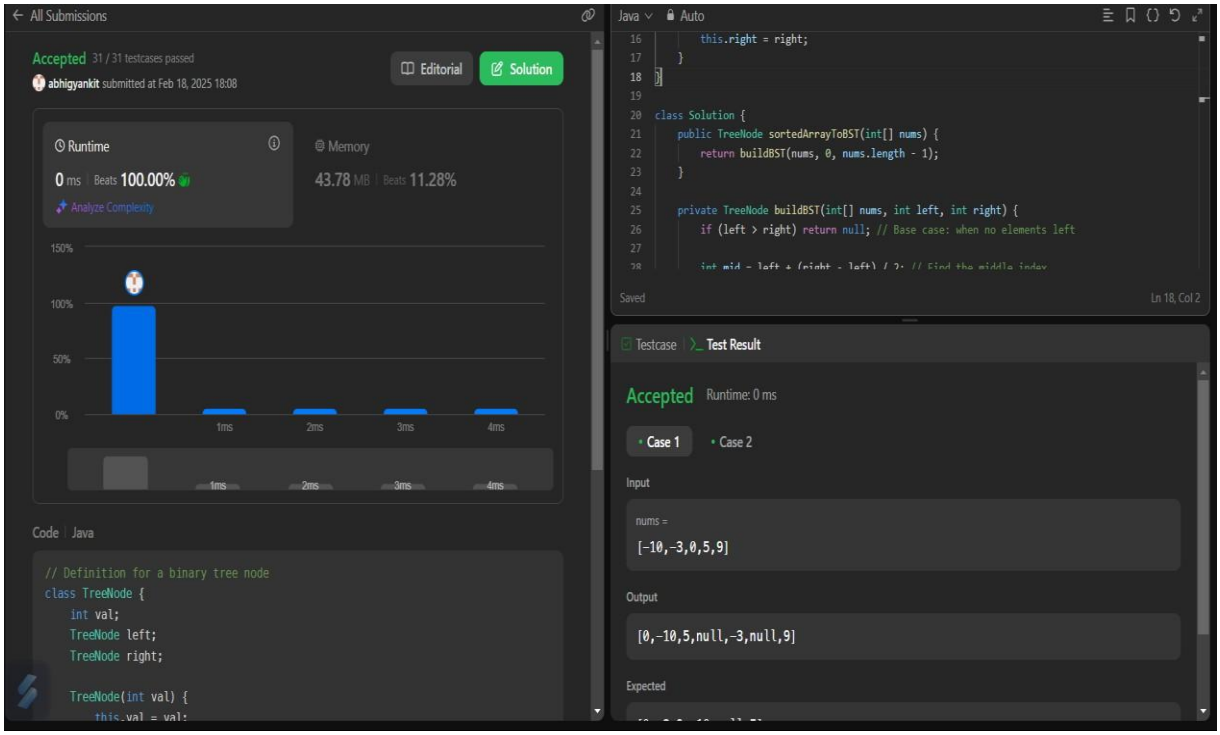
Code:

```
 class TreeNode {
    int val;
    TreeNode left;
    TreeNode right;
TreeNode(int val) {
this.val = val;
this.left = null;
this.right = null;
    }
    TreeNode(int val, TreeNode left, TreeNode right) {
this.val = val;         this.left = left;         this.right =
right;
    }
} class Solution
{
    public TreeNode sortedArrayToBST(int[] nums) {
return buildBST(nums, 0, nums.length - 1);
    }
```

```
    private TreeNode buildBST(int[] nums, int left, int right) {
if (left > right) return null; // Base case: when no elements left
int mid = left + (right - left) / 2; // Find the middle index
        TreeNode root = new TreeNode(nums[mid]); // Middle element becomes root
root.left = buildBST(nums, left, mid - 1);  // Construct left subtree         root.right
= buildBST(nums, mid + 1, right); // Construct right subtree         return root;

    }
    // Utility function to print inorder traversal (for testing)
public void inorderTraversal(TreeNode root) {         if
(root != null) {
            inorderTraversal(root.left);
System.out.print(root.val + " ");
inorderTraversal(root.right);
        }
    }
    // Main method for testing     public
static void main(String[] args) {
Solution solution = new Solution();
int[] nums = {-10, -3, 0, 5, 9};
        TreeNode root = solution.sortedArrayToBST(nums);
System.out.println("Inorder Traversal of BST:");
solution.inorderTraversal(root);
    }
}
```

Output:



104. Maximum Depth of Binary Tree

Aim: 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.

Code:

```
class TreeNode {
    int val;
    TreeNode left;
    TreeNode right;
    TreeNode(int x) { val = x; }
}
class Solution {
    public int maxDepth(TreeNode root) {
if (root == null) {
            return 0; // Base case: if the node is null, the depth is 0
```

```
        }
        int leftDepth = maxDepth(root.left);        int
rightDepth = maxDepth(root.right);        return
Math.max(leftDepth, rightDepth) + 1;
    }
}
```

Output: