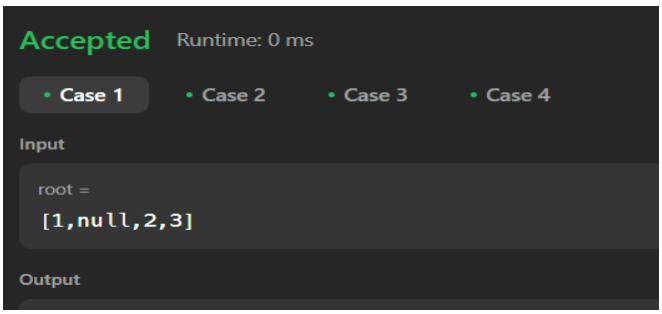
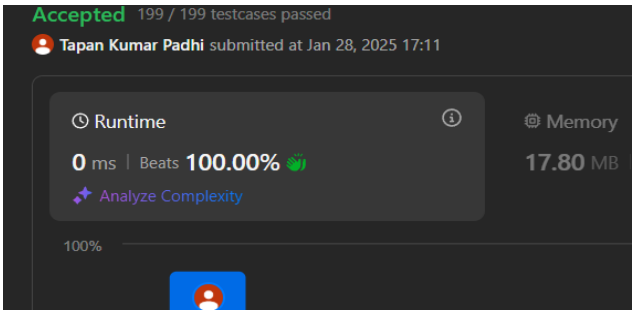
1.

```
class Solution {
    public List<Integer> inorderTraversal(TreeNode root) {
        List<Integer> res = new ArrayList<>();
        Stack<TreeNode> stack = new Stack<>();
        TreeNode curr = root;
        while (curr != null || !stack.isEmpty()) {
            while (curr != null) {
                stack.push(curr);
                curr = curr.left;
            }
            curr = stack.pop();
            res.add(curr.val);
            curr = curr.right;
        }
        return res;
    }
}
```



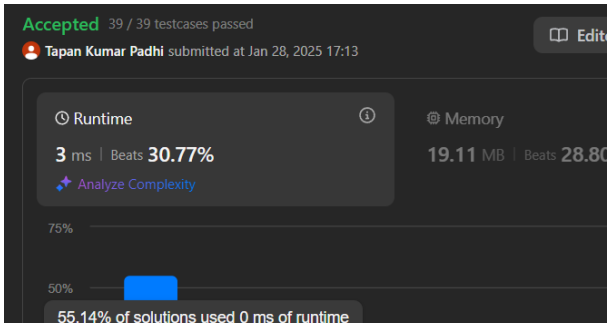
2.

```
class Solution {
    public boolean isSymmetric(TreeNode root) {
        public boolean isSymmetric(TreeNode root) {
        return root == null || isMirror(root.left, root.right);
    }
    private boolean isMirror(TreeNode t1, TreeNode t2) {
        if (t1 == null || t2 == null) return t1 == t2;
        return t1.val == t2.val && isMirror(t1.left, t2.right) && isMirror(t1.right, t2.left);
    }
}
```



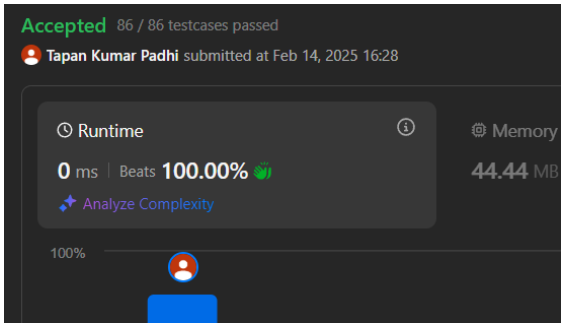
3.

```
class Solution {
    public int maxDepth(TreeNode root) {
        public int maxDepth(TreeNode root) {
        if (root == null) return 0;
        return 1 + Math.max(maxDepth(root.left), maxDepth(root.right));
    }
}
```



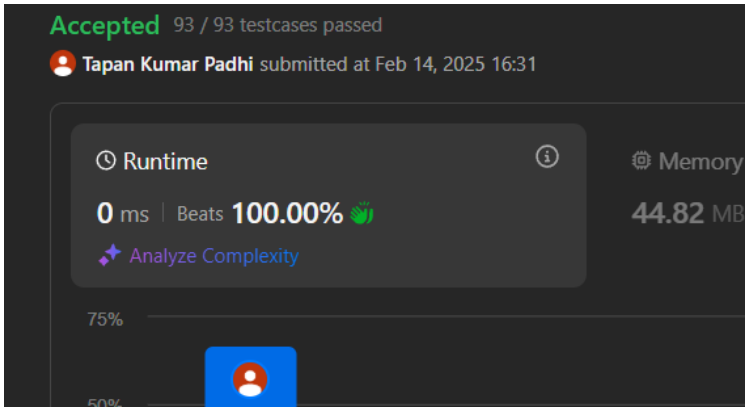
4.

```
class Solution {
    public boolean isValidBST(TreeNode root) {
        return validate(root, null, null);
    }
    private boolean validate(TreeNode node, Integer low, Integer high) {
        if (node == null) return true;
        if ((low != null && node.val <= low) || (high != null && node.val >= high)) return false;
        return validate(node.left, low, node.val) && validate(node.right, node.val, high);
    }
}
```



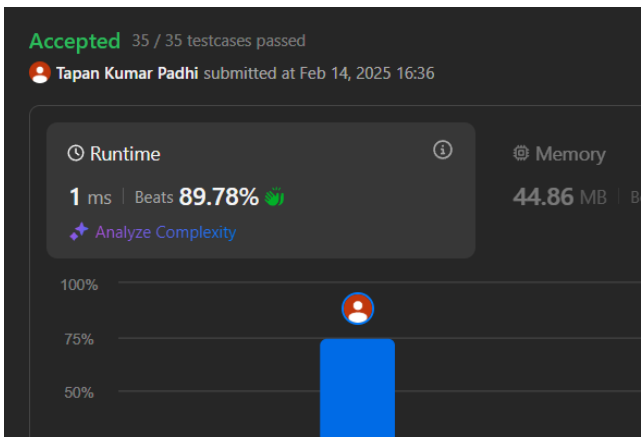
5.

```
class Solution {
    public int kthSmallest(TreeNode root, int k) {
        Stack<TreeNode> stack = new Stack<>();
        while (true) {
            while (root != null) {
                stack.push(root);
                root = root.left;
            }
            root = stack.pop();
            if (--k == 0) return root.val;
            root = root.right;
        }
    }
}
```



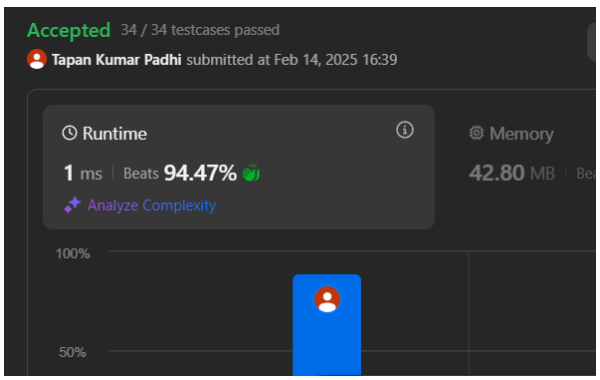
6.

```
class Solution {
    public List<List<Integer>> levelOrder(TreeNode root) {
        List<List<Integer>> res = new ArrayList<>();
        if (root == null) return res;
        Queue<TreeNode> queue = new LinkedList<>();
        queue.offer(root);
        while (!queue.isEmpty()) {
            List<Integer> level = new ArrayList<>();
            int size = queue.size();
            for (int i = 0; i < size; i++) {
                TreeNode node = queue.poll();
                level.add(node.val);
                if (node.left != null) queue.offer(node.left);
                if (node.right != null) queue.offer(node.right);
            }
            res.add(level);
        }
        return res;
    }
}
```



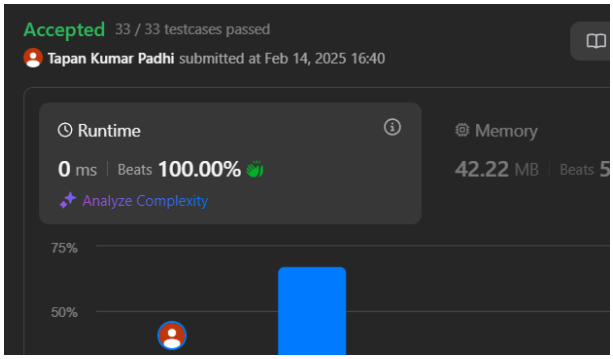
7.

```
class Solution {
    public List<List<Integer>> levelOrderBottom(TreeNode root) {
        LinkedList<List<Integer>> res = new LinkedList<>();
        if (root == null) return res;
        Queue<TreeNode> queue = new LinkedList<>();
        queue.offer(root);
        while (!queue.isEmpty()) {
            List<Integer> level = new ArrayList<>();
            int size = queue.size();
            for (int i = 0; i < size; i++) {
                TreeNode node = queue.poll();
                level.add(node.val);
                if (node.left != null) queue.offer(node.left);
                if (node.right != null) queue.offer(node.right);
            }
            res.addFirst(level);
        }
        return res;
    }
}
```



8.

```
class Solution {
    public List<List<Integer>> zigzagLevelOrder(TreeNode root) {
        List<List<Integer>> res = new ArrayList<>();
        if (root == null) return res;
        Queue<TreeNode> queue = new LinkedList<>();
        queue.offer(root);
        boolean leftToRight = true;
        while (!queue.isEmpty()) {
            LinkedList<Integer> level = new LinkedList<>();
            int size = queue.size();
            for (int i = 0; i < size; i++) {
                TreeNode node = queue.poll();
                if (leftToRight) level.addLast(node.val);
                else level.addFirst(node.val);
                if (node.left != null) queue.offer(node.left);
                if (node.right != null) queue.offer(node.right);
            }
            res.add(level);
            leftToRight = !leftToRight;
        }
        return res;
    }
}
```



9.

```
class Solution {
    public List<Integer> rightSideView(TreeNode root) {
        List<Integer> res = new ArrayList<>();
        if (root == null) return res;
        Queue<TreeNode> queue = new LinkedList<>();
        queue.offer(root);
        while (!queue.isEmpty()) {
            int size = queue.size();
            for (int i = 0; i < size; i++) {
                TreeNode node = queue.poll();
                if (i == size - 1) res.add(node.val);
                if (node.left != null) queue.offer(node.left);
                if (node.right != null) queue.offer(node.right);
            }
        }
        return res;
    }
}
```