

Time Complexity Report for BST Program

1. Insertion

- Best Case (Balanced BST): $O(\log n)$
- Worst Case (Unbalanced BST): $O(n)$

2. In-order Traversal

- Time Complexity: $O(n)$

3. Finding the k-th Smallest Element

- Time Complexity: $O(1)$

Overall :

Best Case: $O(n \log n)$ (if the tree is balanced)

Worst Case: $O(n^2)$ (if the tree is unbalanced)