

CS5800: Algorithms Spring 2018

Assignment 5.2

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Algorithm:

1. Traverse the given binary search tree in Inorder and save nodes in an array
This will create a sorted array which can be used to create a balanced binary search tree
2. Make the middle element of array, root of the new binary search tree
3. Recursively do the same thing for left half of the sorted array and
assign to left of the root
4. Recursively do the same operation for right half of the sorted array and
assign to right of the root

Analysis:

The inorder traversal takes $O(n)$ time. Creating the new tree from sorted array also takes $O(n)$ time, since each node is visited once. So, time complexity is $O(n)$. Space complexity is $O(n)$ to store n nodes in array.