



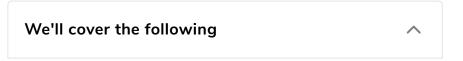






Solution Review: Find Ancestors of a given node in a BST

This review provides a detailed analysis of the different ways to solve the Find Ancestors of a given node in a Binary Tree challenge



- Solution #1: Using a recursive helper function
 - Time Complexity
- Solution #2: Iteration
 - Time Complexity

Solution #1: Using a recursive helper function

```
main.py

BinarySearchTree.py

Node.py

1 from Node import Node
2 from BinarySearchTree import BinarySearchTree
3
4
5 def findAncestors(root, k):
6 result = []
7 recfindAncestors(root, k, result) # recursively find ancestors
8 return str(result) # return a string of ancestors
```

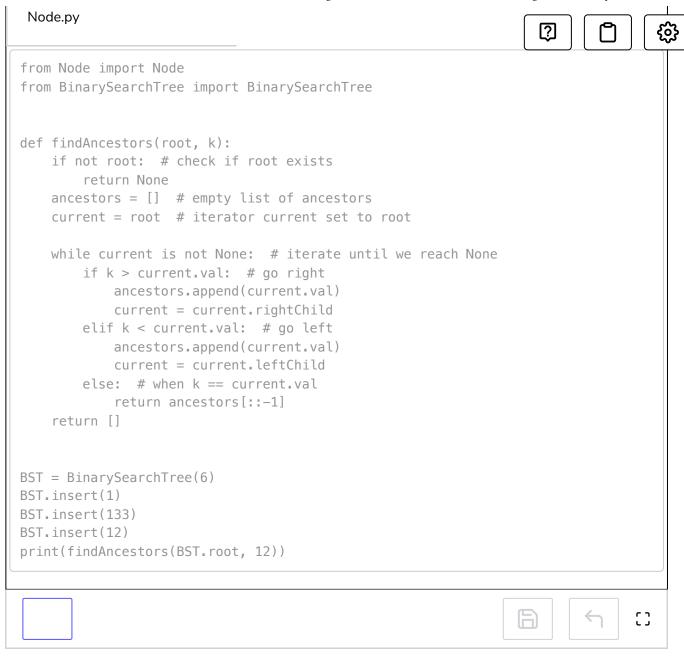
```
10
11
    def recfindAncestors(root, k, result):
12
        if root is None: # check if root exists
13
            return False
14
        elif root.val is k: # check if val is k
15
            return True
        recur_left = recfindAncestors(root.leftChild, k, result)
16
17
        recur_right = recfindAncestors(root.rightChild, k, result)
18
        if recur_left or recur_right:
            # if recursive find in either left or right sub tree
19
            # append root value and return true
20
21
            result.append(root.val)
22
            return True
23
        return False # return false if all failed
24
25
26 BST = BinarySearchTree(6)
   BST.insert(1)
27
28
   BST.insert(133)
                                                                         []
```

This solution uses a recursive helper function that The recursive function starts traversing from the root till the input node and backtracks to append the ancestors that led to the node.

Time Complexity#

This is an O(n) time function since it iterates over all of the nodes of the entire tree.

Solution #2: Iteration#



This solution conducts a search for k in the BST until a None node or k itself is reached. If k is reached, the ancestors are returned, otherwise, an empty list is returned.

Time Complexity#

The time complexity of this solution is O(log(n)) since a path from the root to k is traced.



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Challenge 3: Find Ancestors of a given...



Challenge 4: Find the Height of a BST



✓ Completed



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