

Data Structures

BST Homework 3

Mostafa S. Ibrahim

Teaching, Training and Coaching for more than a decade!

Artificial Intelligence & Computer Vision Researcher

PhD from Simon Fraser University - Canada

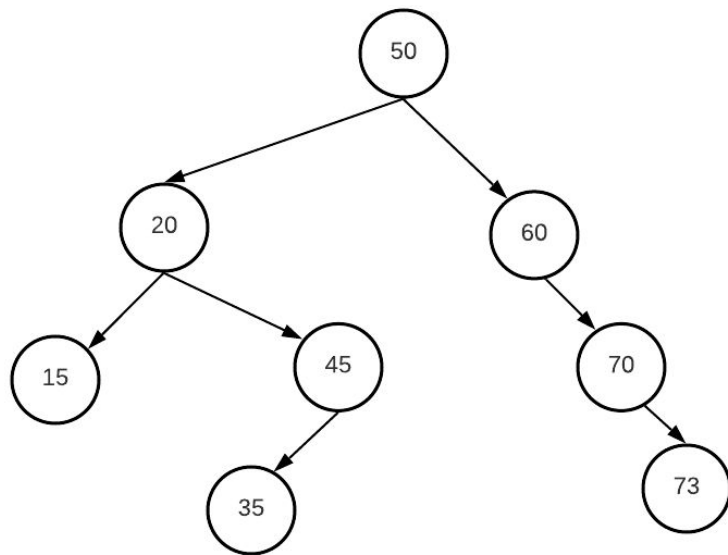
Bachelor / Msc from Cairo University - Egypt

Ex-(Software Engineer / ICPC World Finalist)



Problem #1: BST from preorder

- Given a list (or deque if you want), representing the preorder of BST
- Develop: `def get_tree_from_preorder(self, nodes_lst)`
- It will return BST for this preorder
- Describe **different ways** to solve this problem
 - I am providing $O(n^2)$ solution
 - And guidelines to improve to $O(n)$
 - Another different idea in $O(n)$
 - This one uses deque not list



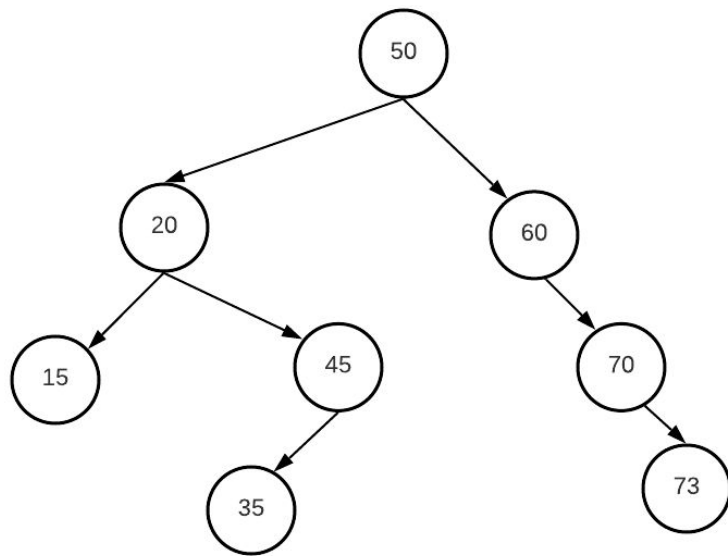
```
tree = BinaryTree(50)
tree.insert([20, 60, 15, 45, 70, 35,
             73, 14, 16, 36, 58])

lst1 = tree.preorder()
tree2 = tree.get_tree_from_preorder(lst1.copy())
lst2 = tree2.preorder()

assert lst1 == lst2
```

Problem #2: BST from level-order traversal

- `def get_tree_from_traversal(self, nodes_deque)`
- Given level-order traversal in a deque, build the BST
- Tree level order: 50 20 60 15 45 70 35 73



“Acquire knowledge and impart it to the people.”

“Seek knowledge from the Cradle to the Grave.”