Assignment 1

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Download all latex-tikz and C codes from

https://github.com/ipsingh85/EE4013/tree/main/Assingment_1/codes

https://github.com/ipsingh85/EE4013/tree/main/Assingment_1/Assingment_1.tex

1 Problem

(Q 5) The preOrder traversal of a binary search tree is 15,10,12,11,20,18,16,19 which one of the following is postOrder traversal of the tree?

1) 10,11,12,15,16,18,19,20
2) 11,12,10,16,19,18,20,15
3) 20,19,18,16,15,12,11,10
4) 19,11,18,20,11,12,10,15

2 Definitions

Answer : Option 2

Binary Search Tree is a node-based binary tree data structure which has the following properties:

1) The left subtree of a node contains only nodes with keys lesser than the node's key.
2) The right subtree of a node contains only nodes with keys greater than the node's key.
3) The left and right subtree each must also be a binary search tree.

PreOrder traversal

Algorithm preOrder

1) Visit the root.
2) Traverse the left subtree.
3) Traverse the right subtree.

PostOrder traversal

Algorithm Postorder

1) Traverse the left subtree.
2) Traverse the right subtree.
3) Visit the root.

3 Explanation :

so first we will convert this preorder traversal in to a binary search tree then print the postorder traversal. as we know first element of preorder traversal is root node and element with value less than root value make left subtree and element vaule greater than root value make right subtree.

given preOrder traversal 15,10,12,11,20,18,16,19
root key 15
left subtree 10,12,11
right subtree 20,18,16,19
similaraly for every left subtree and right subtree

left and right subtree for every node			
preOrder traversal	root node	left subtree	right subtree
15 10 12 11 20 18 16 19	15	10 12 11	20 18 16 19
10 12 11	10	NA	12 11
12 11	12	11	NA
20 18 16 19	20	18 16 19	NA
18 16 19	18	16	19

using the table draw node diagram of given pre-Order traversal

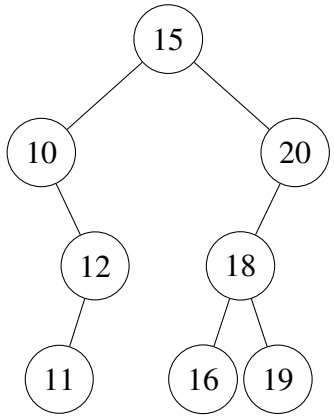

Fig. 3: BST diagram of given preOrder traversal

from above tree using postOrder traversal algorithm
print the postOrder traversal
postrder traversal 11**,**12**,**10**,**16**,**19**,**18**,**20**,**15