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 Solution

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.

Explanation :

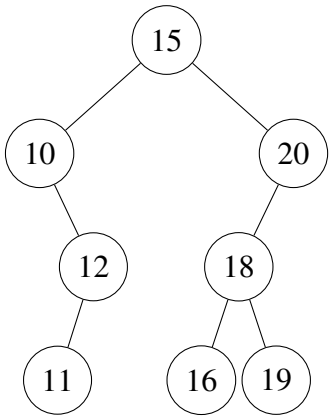
so first we will convert this preorder traversal in to a binary search tree then print the postorder traversal.

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

Country List			
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	No element less than 10	12,11
12,11	12	11	No element greater than 12
20,18,16,19	20	18,16,19	NA
18,16,19	18	16	19

using the table create a BST



from above tree using postorder traversal algorithm print the postorder traversal

hence postorder traversal 11,12,10,16,19,18,20,15