# Binary Tree

**Submitted by Biraj Subedi**

Data Structure and Algorithm

# Post-order Traversal

## I.

1.Traverse the left subtree in postorder.

2.Traverse the right subtree in postorder.

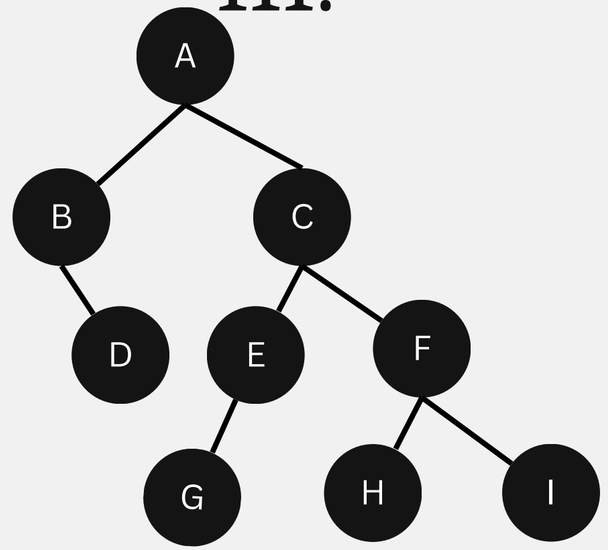
3.Visit the root.

## II.

Algorithm

1.ptr=root
2.postorder(ptr)
3.if(ptr!=NULL)
    a.postorder(ptr->left)
    b.postorder(ptr->right)
    c.print(ptr->info)

## III.




D B G E H I F C A

# In-order Traversal

## I.

1.Traverse the left subtree in inorder.

2.Visit the root.

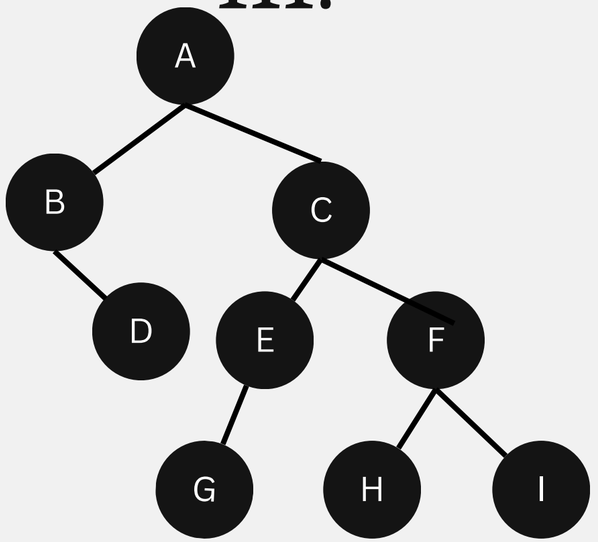
3.Traverse the right subtree in postorder

## II.

Algorithm

1.ptr=root
2.inorder(ptr)
3.if(ptr!=NULL)
    a.inorder(ptr->left)
    b.print(ptr->info)
    c.inorder(ptr->right)

## III.




B D A G E C H F I

# Binary Tree from In-order and Post-order

**Post-order:9,1,2,12,7,5,3,11,4,8**
**Left Right Root**

**In-order:9,5,1,7,2,12,8,4,3,11**
**Left Root Right**

For root look post-order from the end

For branch look in-order

# Implementation

**Post-order:9,1,2,12,7,5,3,11,4,8**

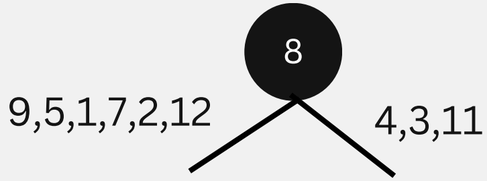
**In-order:9,5,1,7,2,12,8,4,3,11**

## Phase 1

8 it taken first for the root.

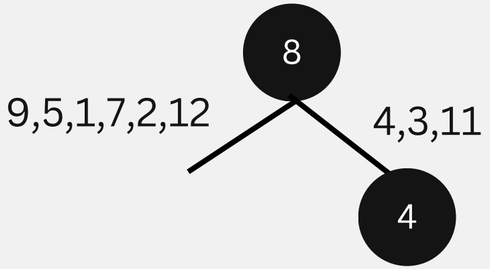

## Phase 2

Left of 8 in inorder is left branch and right is right branch.




## Phase 3

Next element in postorder is 4.



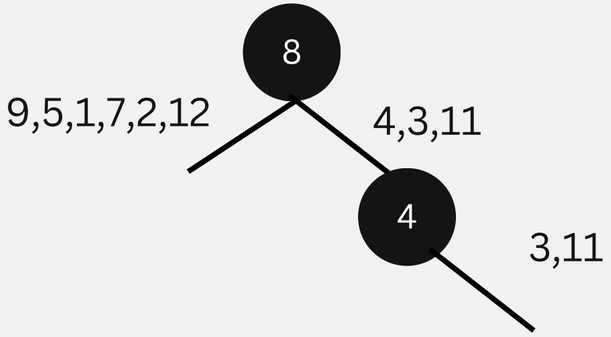
# Implementation

**Post-order:9,1,2,12,7,5,3,11,4,8**

**In-order:9,5,1,7,2,12,8,4,3,11**

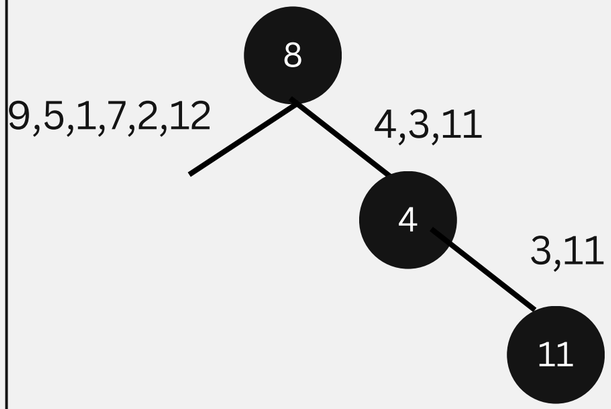
## Phase 4

At left of 4 there is no element (i.e no left branch ) and right elements in right branch.



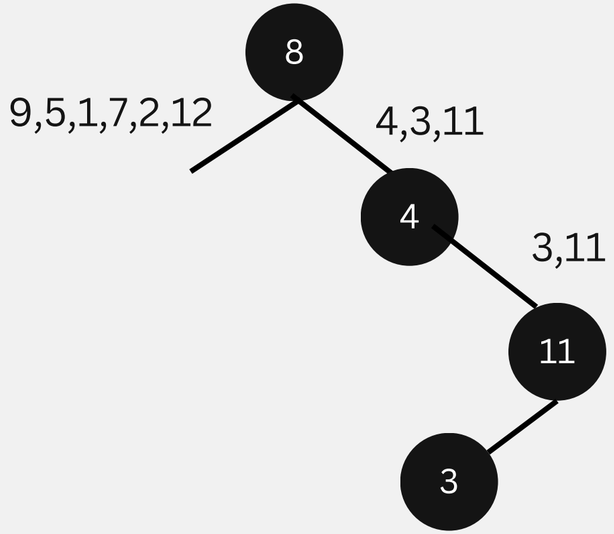

## Phase 5

Next element in postorder is 11.




## Phase 6

At right of 11 there is no element (i.e no right branch) and left element in left branch.



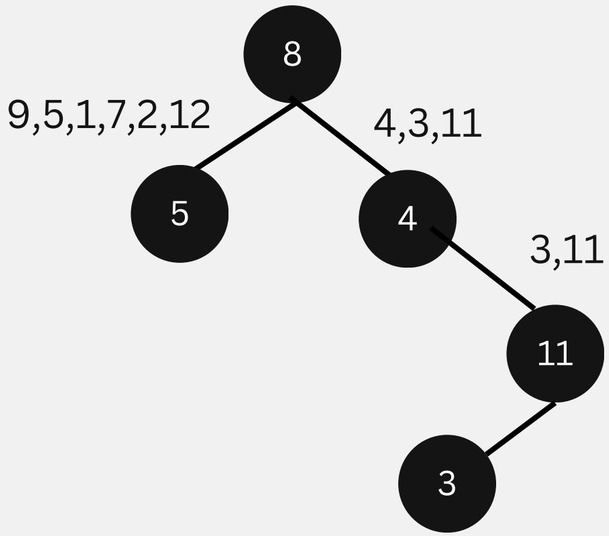
# Implementation

**Post-order:9,1,2,12,7,5,3,11,4,8**

**In-order:9,5,1,7,2,12,8,4,3,11**

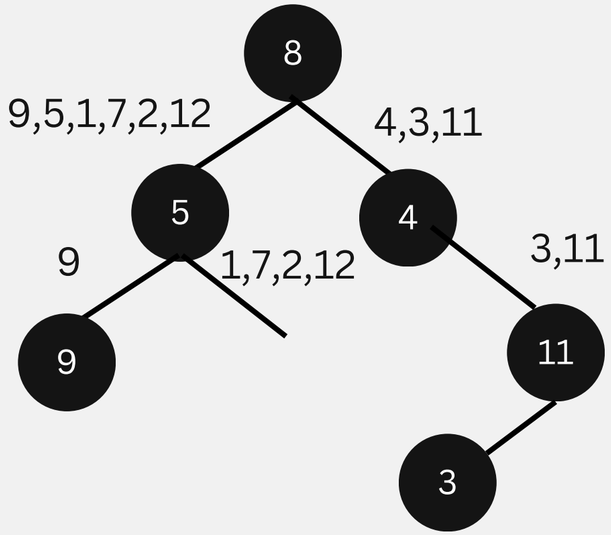
## Phase 7

Next element in postorder is 5 which goes to left branch .



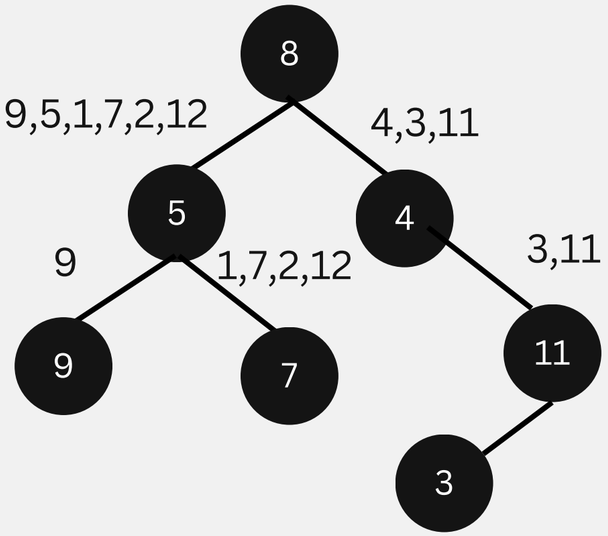

## Phase 8

In inorder elements right to 5, lies in right branch and elements in left, lies in left branch.




## Phase 9

In postorder next element is 7 which goes to right branch.



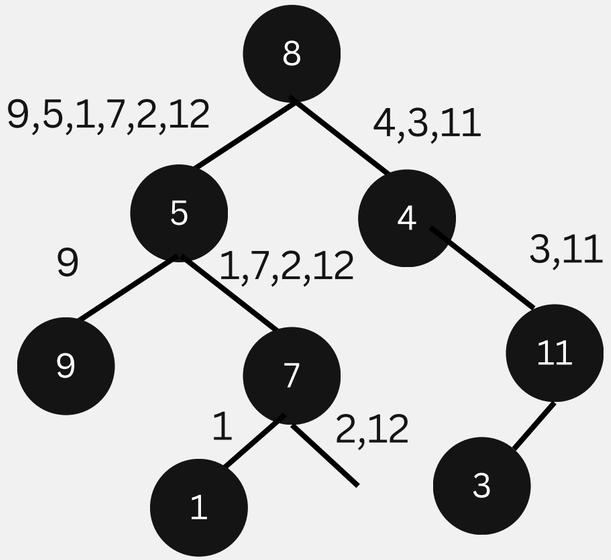
# Implementation

**Post-order:9,1,2,12,7,5,3,11,4,8**

**In-order:9,5,1,7,2,12,8,4,3,11**

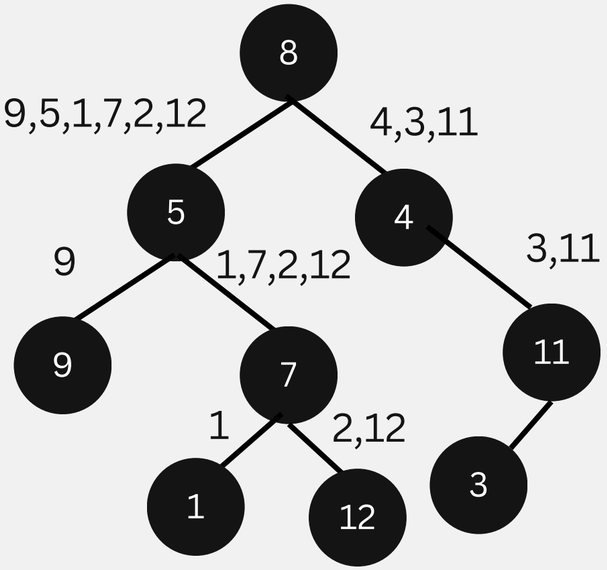
## Phase 10

In inorder elements right to 7, lies in right branch and elements in left, lies in left branch.




## Phase 11

In postorder next element is 12 which goes to right branch.



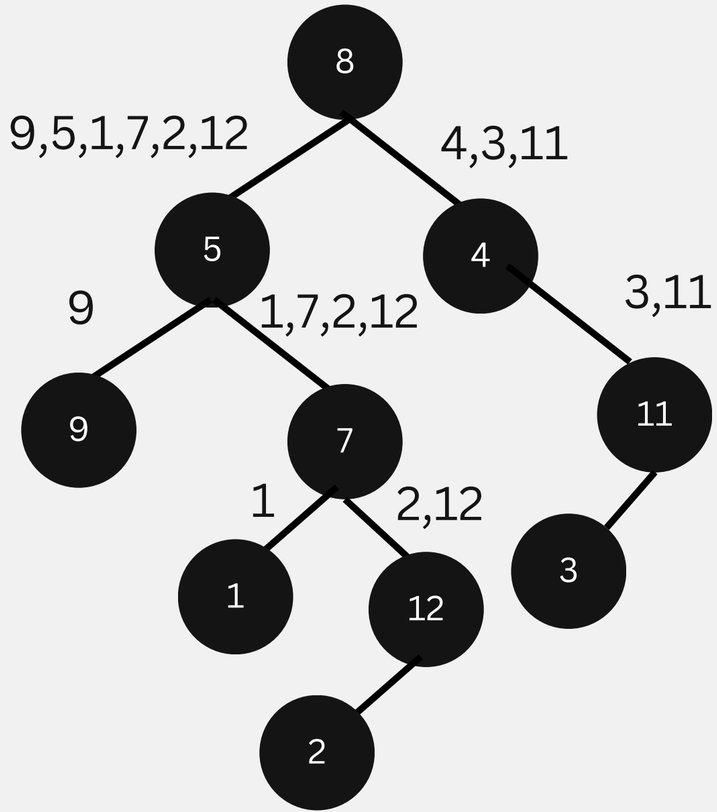
# Implementation

**Post-order:9,1,2,12,7,5,3,11,4,8**

**In-order:9,5,1,7,2,12,8,4,3,11**

## Final Phase

At right of 12 there is no element (i.e no right branch ) and left element in left branch.



# THANK YOU!