SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

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DEPARTMENT OF INFORMATION TECHNOLOGY

19ITT101-PROGRAMMING IN C AND DATA STRUCTURES
I YEAR - II SEM

## UNIT 5 – Trees

TOPIC 3 – Tree Traversal

Tree Traversal

➢Traversal is a process to visit all the nodes of a tree and may print their values too. Because, all nodes are connected via edges (links) we always start from the root (head) node.
➢ There are three ways which we use to traverse a tree −

        ❖ In-order Traversal lRr
        ❖ Pre-order Traversal Rlr
        ❖ Post-order Traversal lrR

Inorder Traversal
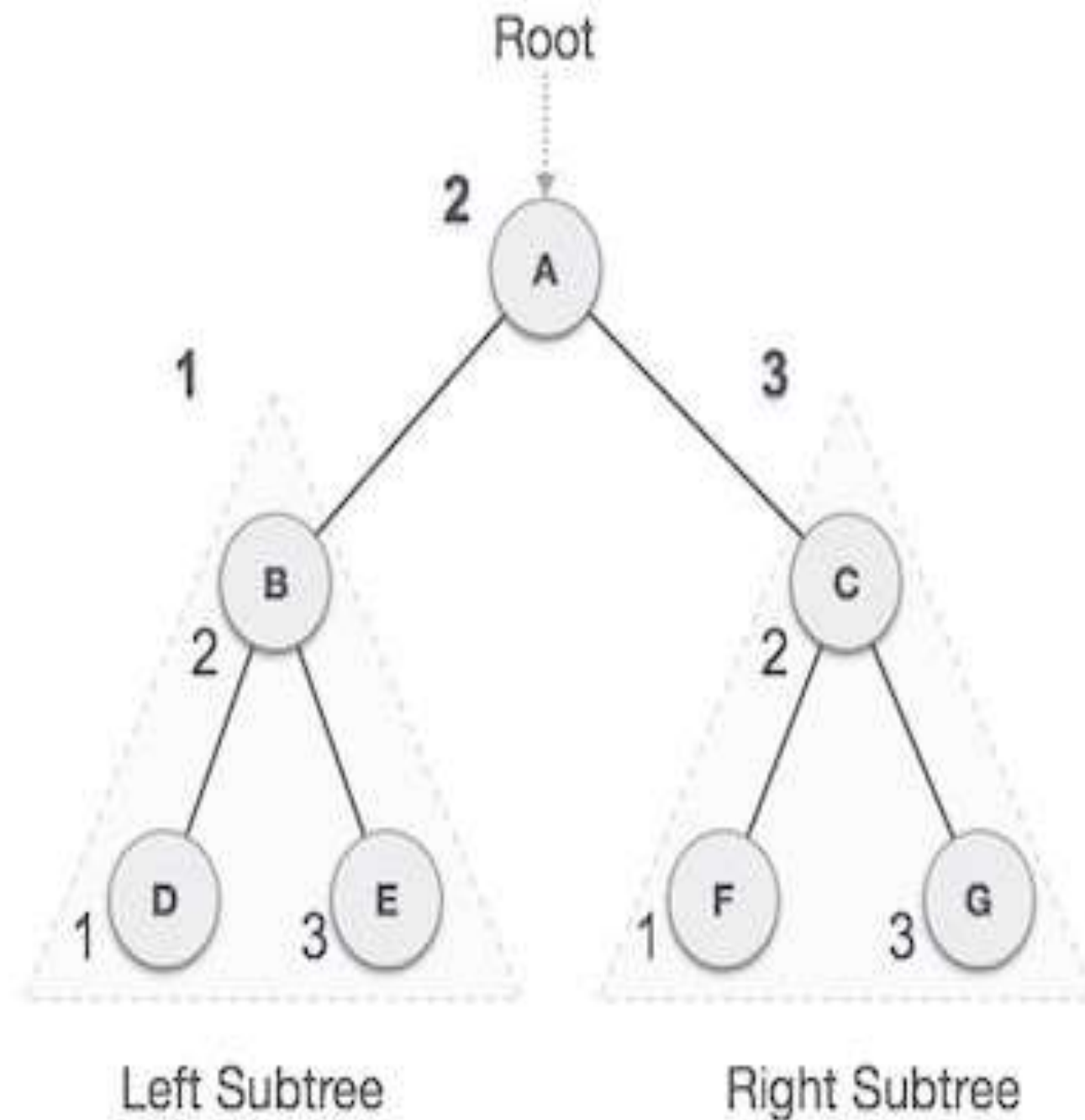
➢ If a binary tree is traversed in-order, the output will produce sorted key values in an ascending order.

➢ We start from A, and following in-order traversal, we move to its left subtree B. B is also traversed in-order. The process goes on until all the nodes are visited.

➢ **D → B → E → A → F → C → G**

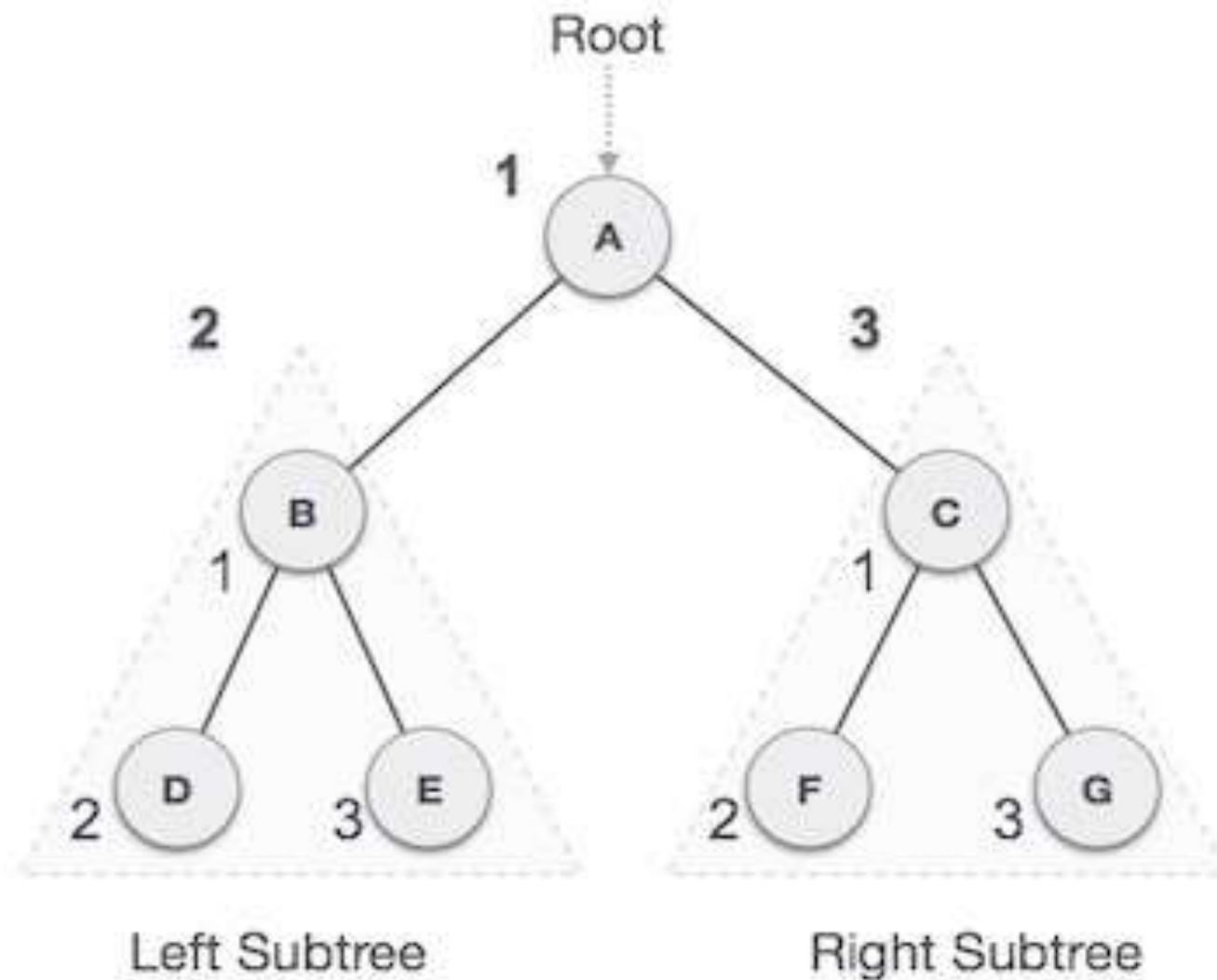# Algorithm for In order

Until all nodes are traversed −

Step 1 − Recursively traverse left subtree.

Step 2 − Visit root node.

Step 3 − Recursively traverse right subtree.

Pre order Traversal

Root

1 A

2 B   3 C

1

2 D   3 E   2 F   3 G

Left Subtree   Right Subtree

➢ In this traversal method, the root node is visited first, then the left subtree and finally the right subtree.
➢ We start from A, and following pre-order traversal, we first visit A itself and then move to its left subtree B.
➢ B is also traversed pre-order. The process goes on until all the nodes are visited
➢ $A \rightarrow B \rightarrow D \rightarrow E \rightarrow C \rightarrow F \rightarrow G$

Algorithm for Pre order

Until all nodes are traversed –

Step 1 – Visit root node.

Step 2 – Recursively traverse left subtree.

Step 3 – Recursively traverse right subtree.

Post order Traversal

Left Subtree · Right Subtree

➢ In this traversal method, the root node is visited last, hence the name. First we traverse the left subtree, then the right subtree and finally the root node.

➢ We start from A, and following Post-order traversal, we first visit the left subtree B. B is also traversed post-order. The process goes on until all the nodes are visited.

➢ **D → E → B → F → G → C → A**

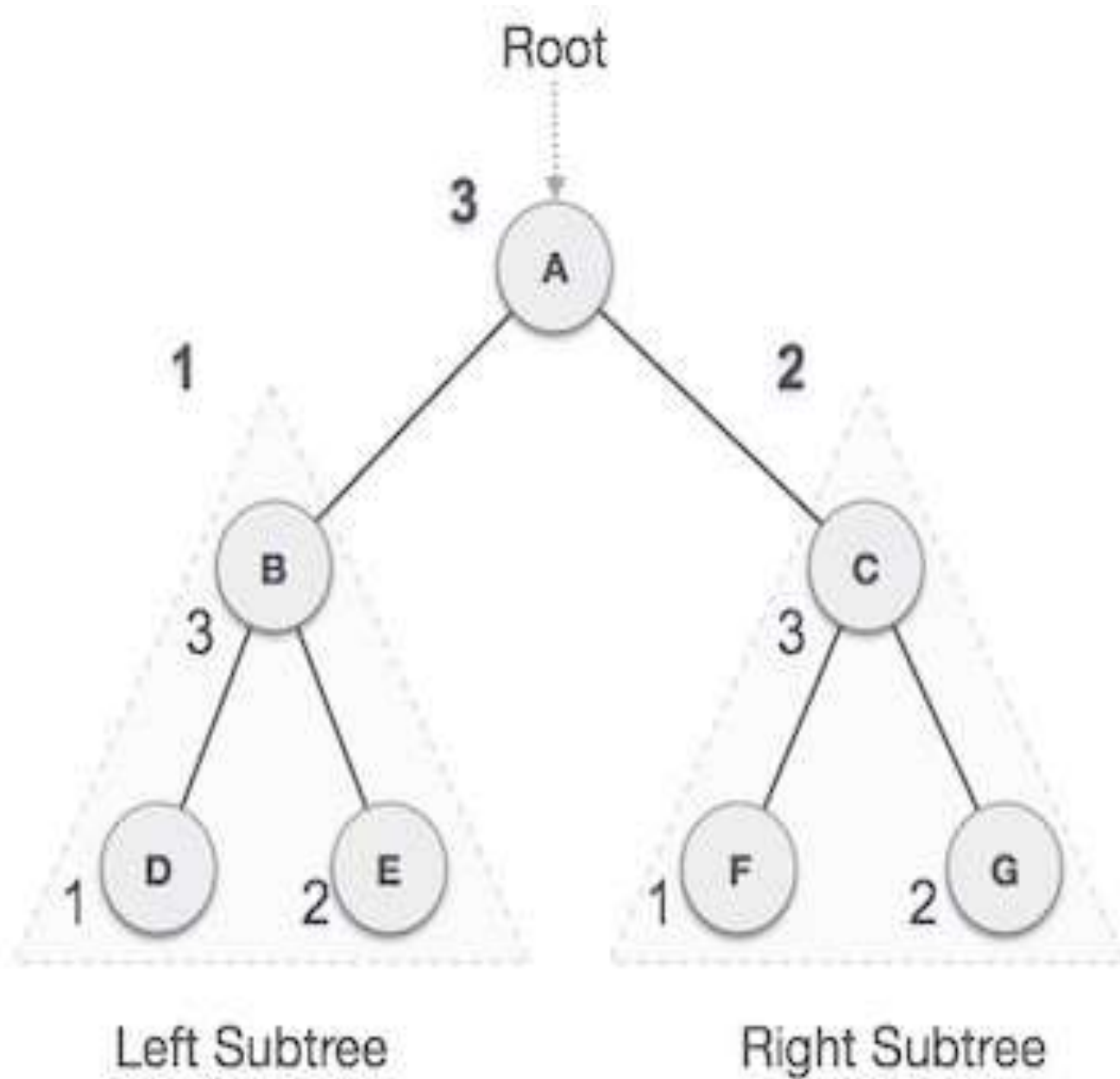# Algorithm for Post order

Until all nodes are traversed –

Step 1 – Recursively traverse left subtree.

Step 2 – Recursively traverse right subtree.

Step 3 – Visit root node.