SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

23ITT101-PROGRAMMING IN C AND DATA STRUCTURES

I YEAR - II SEM

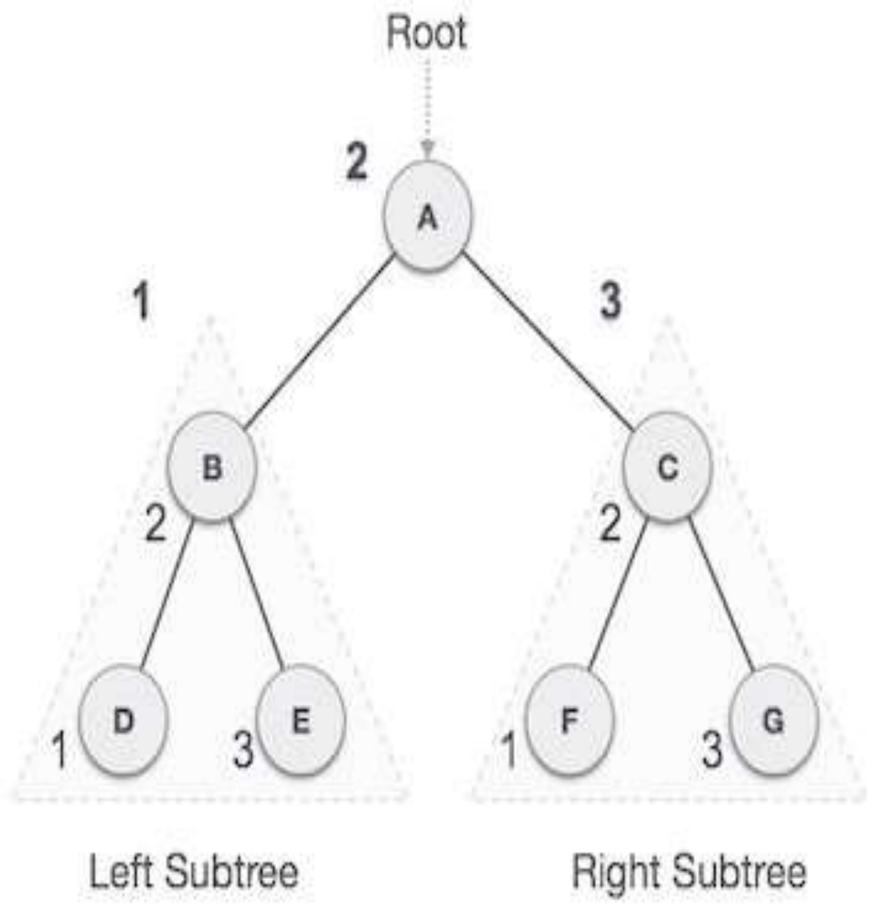
UNIT 5 – Trees

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

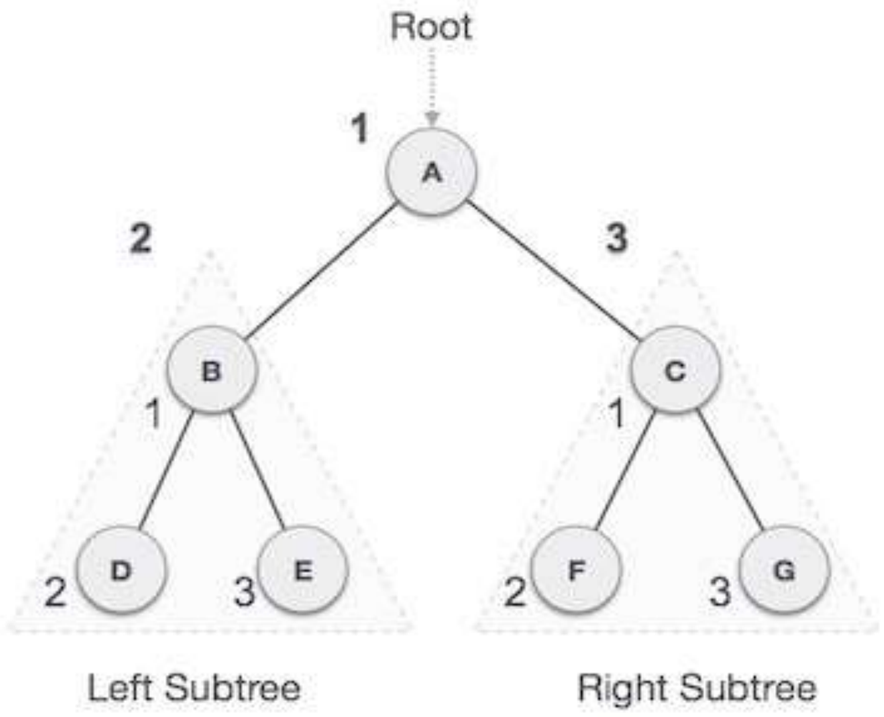
Until all nodes are traversed -

Step 1 - Recursively traverse left subtree.

Step 2 - Visit root node.

Step 3 - Recursively traverse right subtree.

Pre order Traversal



- 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 → B → D → E → C → F → G***

Algorithm for Pre order

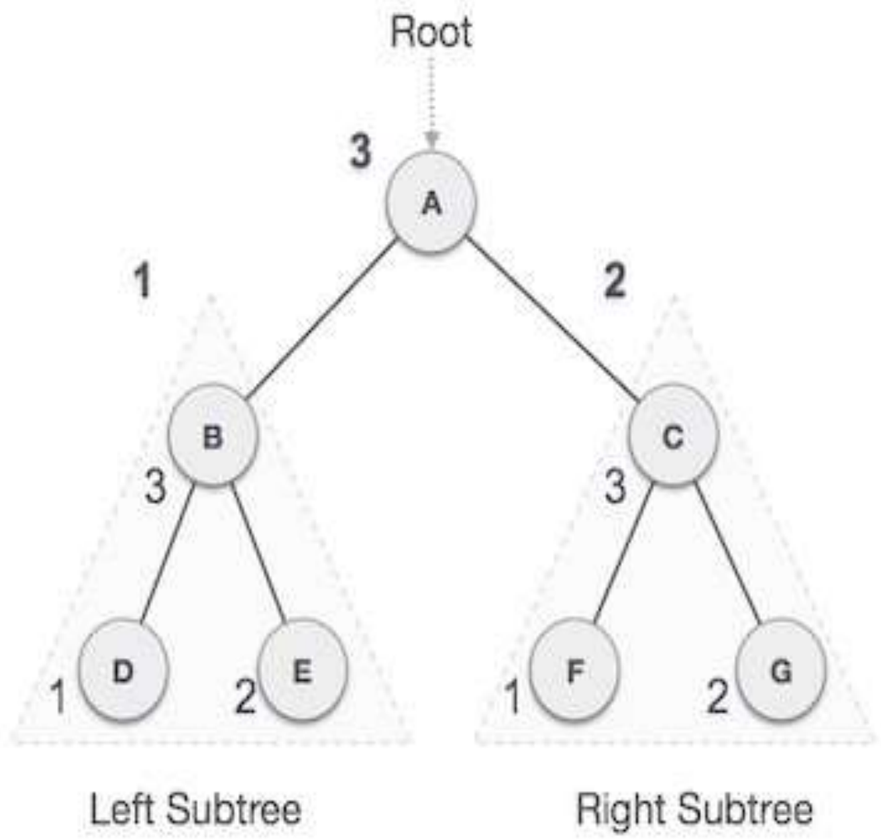
Until all nodes are traversed -

Step 1 - Visit root node.

Step 2 - Recursively traverse left subtree.

Step 3 - Recursively traverse right subtree.

Post order Traversal



- 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.