SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF MCA

19CAT602 –DATA STRUCTURES & ALGORITHMS

UNIT - II

TOPIC 10: TREE

Tree

+ A Tree is a recursive data structure containing the set of **one or more data nodes**

+ Where one node is designated as the **root of the tree**

+ While the remaining nodes are called as the **children of the root**.

+ The nodes other than the root node are partitioned into the non empty sets where each one of them is to be called **sub-tree**.

+ Nodes of a tree either maintain a parent-child relationship between them or they are sister nodes.

+ In a general tree, A node can have any number of children nodes but it can have only a single parent.

Huffman Algorithm/19CAT602-Data Structures and Algorithms/Nandhini N /MCA/SNSCT

Properties of Tree

1. One and only path between every pair of vertices in a tree

2. A tree with n vertices has n-1 edges

3. A graph is a tree if and only if it is minimally connected
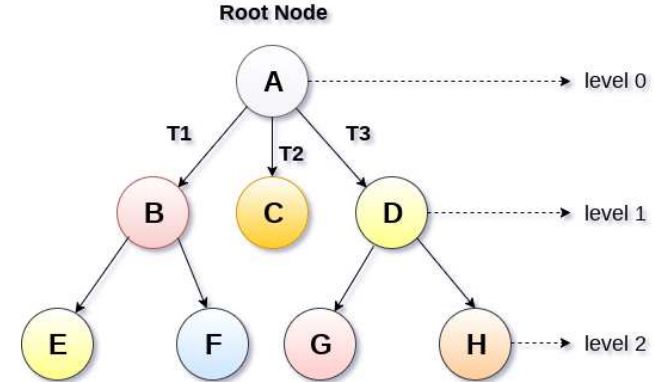
Trees: Basic terminology

1. **Root Node** :- Topmost node in the tree hierarchy.

2. **Sub Tree** :- If the root node is not null, the tree T1, T2 and T3 is called sub-trees of the root node.

3. **Leaf Node** :- The node of tree, which doesn't have any child node, is called leaf node. Leaf nodes can also be called external nodes.

4. **Path** :- The sequence of consecutive edges is called path. Path to the node E is A→ B → E.

5. **Ancestor node** :- An ancestor of a node is any predecessor node on a path from root to that node. The root node doesn't have any ancestors.

6. **Degree** :- Degree of a node is equal to number of children, a node have.

7. **Level Number** :- Each node of the tree is assigned a level number in such a way that each node is present at one level higher than its parent. Root node of the tree is always present at level 0.
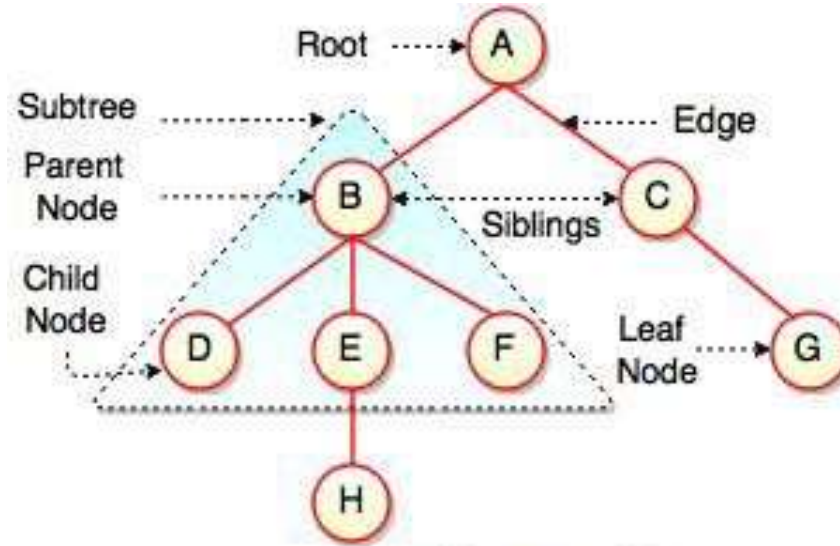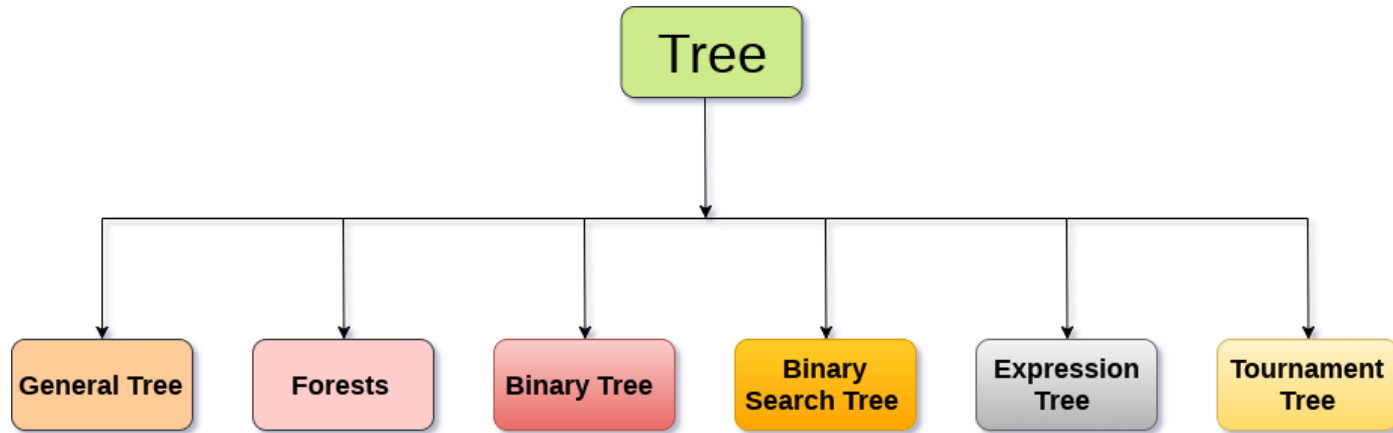
Trees

Fig. Structure of Tree

Tree Types

Huffman Algorithm/19CAT602-Data Structures and Algorithms/Nandhini N /MCA/SNSCT

Assessment

1. The number of edges from the root to the node is called

_____ of the tree.

a) Height

b) Depth

c) Length

d) Width

2. The number of edges from the node to the deepest leaf is called

_____ of the tree.

a) Height

b) Depth

c) Length

d) Width

Reference

1. Tanaenbaum A.S., Langram Y. Augestein M.J "Data Structures using C", Pearson Education , 2008.

2. https://www.studytonight.com/data-structures

3. https://afteracademy.com/blog/Tree

Thank you