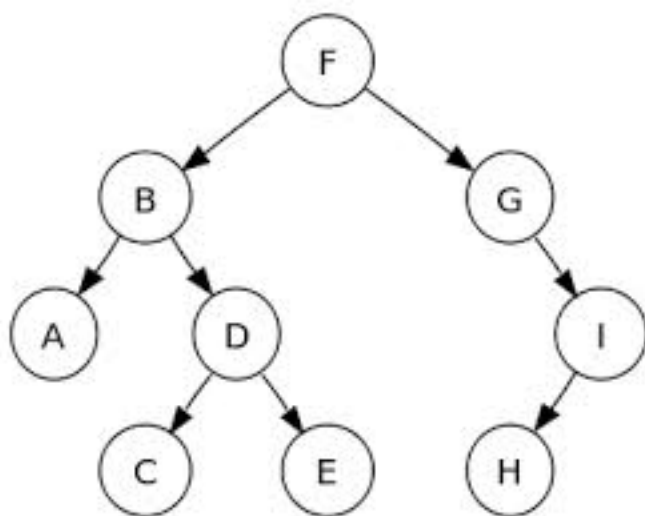


10 Tree

1. Define a tree?
2. Write a program to find number of nodes in a binary tree.
3. Write a program to find number of leaf nodes in a binary tree.
4. Write a program to find height of a binary tree.
5. Write a program to find a node in the binary search tree whose value is closest to input value k.
6. Write a program to check whether a binary tree is a binary search tree.
7. Write an algorithm to delete a node from binary search tree.
8. Define binary search tree (BST)? Can duplicate elements allowed in a BST?
9. Define the height and depth of a node of a binary tree?
10. What is the minimum and maximum height possible of a binary tree with n nodes?
11. What is the exact number of NULL pointers available with a binary tree with n nodes. ?
12. The inorder and postorder traversals of a binary tree T yield the following sequence of nodes:
Inorder : ABCDEFGHI
Postorder: ACEDBHIGF
Find out its Pre-order traversal sequence of the binary tree drawn.
13. Suppose the following list of numbers is inserted in order into an empty binary search tree (BST): 50, 30, 36, 60, 55, 52, 18, 40, 70, 58, 10
(i) Construct the BST.
(ii) Sketch the BST after deleting the node 60.
14. The inorder and postorder traversals of a binary tree T yield the following sequence of nodes:
Inorder : ABCDEFGHI
Preorder : FBADCEGIH
Draw the binary tree T.
Find out its Post-order traversal sequence of the binary tree drawn.
15. Find out the inorder, preorder and postorder traversal of the following tree.



16. Write a program to check whether a binary tree is an AVL tree.
17. Insert the following sequence of elements into an AVL tree, starting with an empty tree: 11, 21, 16, 26, 31, 17, 19, 20. Delete 31 in the AVL tree that you got.
18. Insert the following sequence of elements into an AVL tree, starting with an empty tree: 2, 3, 5, 6, 9, 8, 7, 4.
19. Construct a 2-3 B-tree with the following input data.
2, 3, 5, 6, 9, 8, 7, 4
20. Write a programme to display the nodes of a tree in level wise (first we need to display 0th level node, then 1th level nodes and so on).
21. Write a programme to insert a node into BST both in recursive and non-recursive manner.
22. Write a programme to delete all the nodes in a binary tree.
23. Write a function to display all the paths from root to leaf nodes in a binary tree.
24. Write the non-recursive function for inorder traversal, preorder traversal, and postorder traversal of a binary tree.
25. Starting with an empty tree, insert the following keys into the 2-3 B-tree: 5, 16, 22, 45, 2, 10, 18, 30, 50, 12, 31. Remove the following keys from the above mentioned tree.
22, 30, 45
26. Write a program to display all the nodes of a binary tree whose $|\text{height} - \text{depth}| \leq i$.