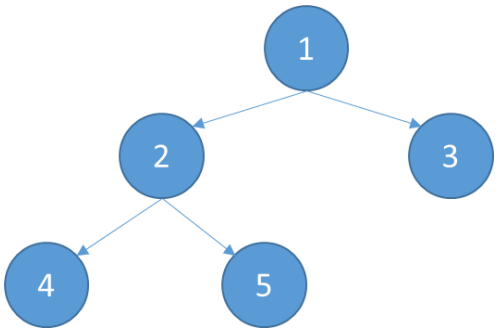
HW

Questions done in class

1. Tree Traversal – Inorder, Preorder, Postorder.
2. Write a Program to calculate the size of the tree.
3. Write a Program to find the height of the tree.
4. Write a program to count the number of nodes in a Binary Tree.
5. Check for children sum property in a Binary Tree.
6. Search a given key in Binary Search Tree, return 1 if found else return 0.

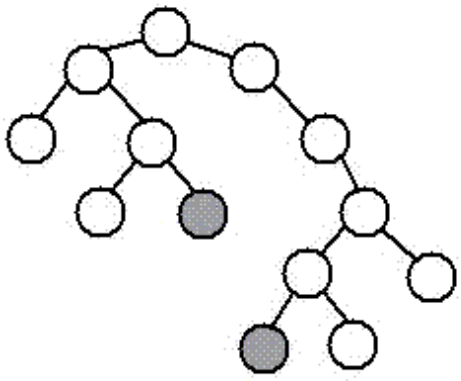
Home Work

1. Perform Level Order traversal in a Binary Tree.

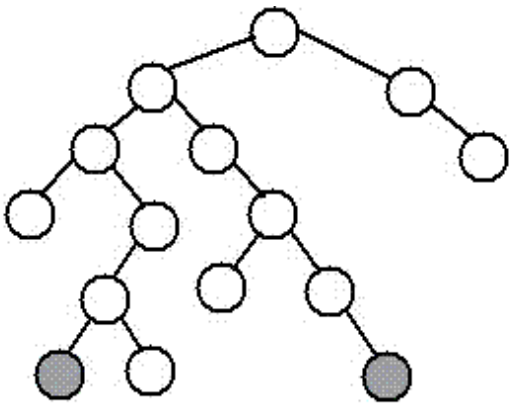


Level Order Traversal for the above tree will be
1 2 3 4 5

2. Give a binary tree Calculate the Diameter.
Diameter of a tree is the number of nodes on the longest path between two leaves.



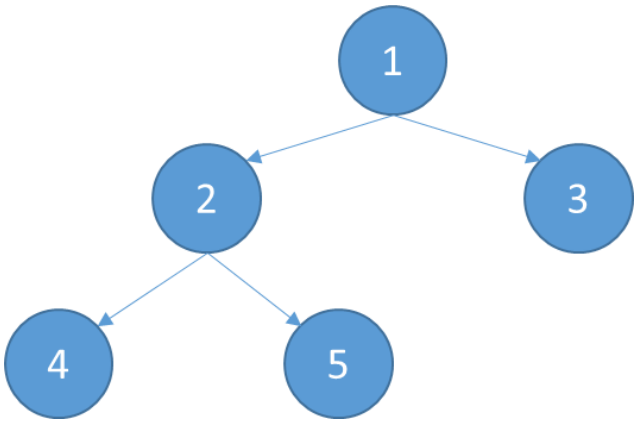
diameter, 9 nodes, through root



diameter, 9 nodes, NOT through root

HW

3. Print all the nodes at Kth Distance from the root.

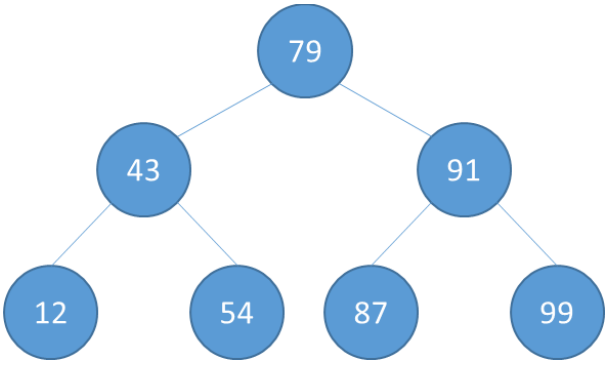


Nodes at Distance 1 from root are 2 & 3
Nodes at Distance 2 from root are 4 & 5

4. Get level of a node in Binary Tree.
   Level of 1 = 0
   Level of 2 = 1
   Level of 3 = 1
   Level of 4 = 1
   Level of 5 = 1

5. Given a Binary tree, print all the root to leaf paths.
   for above tree output is
   1 2 4
   1 2 5
   1 3

6. Find the minimum and maximum value in a given binary tree.

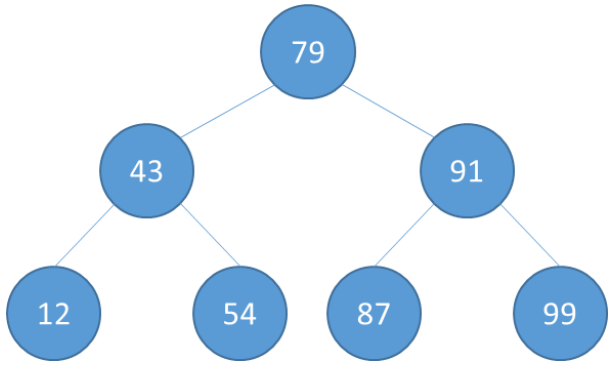


The Minimum value is 12 and Max value is 99.

7. Check if the given Binary Tree is Binary Search Tree or not. Return 1 if it is a binary tree else return 0.
8. Perform insertion and deletion in the Binary Search Tree.
9. Lowest Common Ancestor in a Binary Search Tree.
   According to wiki definition of lowest common ancestor is.

   Let T be a rooted tree. The lowest common ancestor between two nodes n1 and n2 is defined as the lowest node in T that has both n1 and n2 as descendants (where we allow a node to be a descendant of itself).

   The LCA of n1 and n2 in T is the shared ancestor of n1 and n2 that is located farthest from the root. Computation of lowest common ancestors may be useful, for instance, as part of a procedure for determining the distance between pairs of nodes in a tree: the distance from n1 to n2 can be computed as the distance from the root to n1, plus the distance from the root to n2, minus twice the distance from the root to their lowest common ancestor. (Source Wiki)



In the above tree
Common ancestor of 12 and 54 is 43
And for 12 and 99 it is 79