Algorithms and Data Structures: Advances Trees

Exercise – 3-1

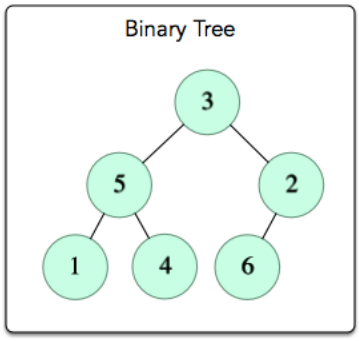
Dr Nagarajan Ganapathy

Version 1

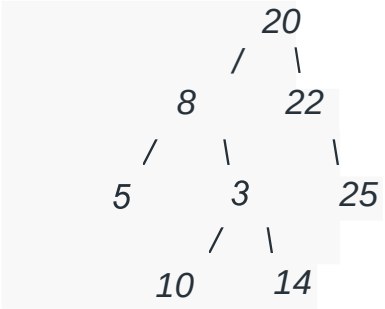
Datum: 10.10.2023

Write the most efficient algorithm for the following problems in C++ and mention the Time and Space Complexity of your algorithms in the comments (at the end):

1. **Is this a Binary Search Tress?**



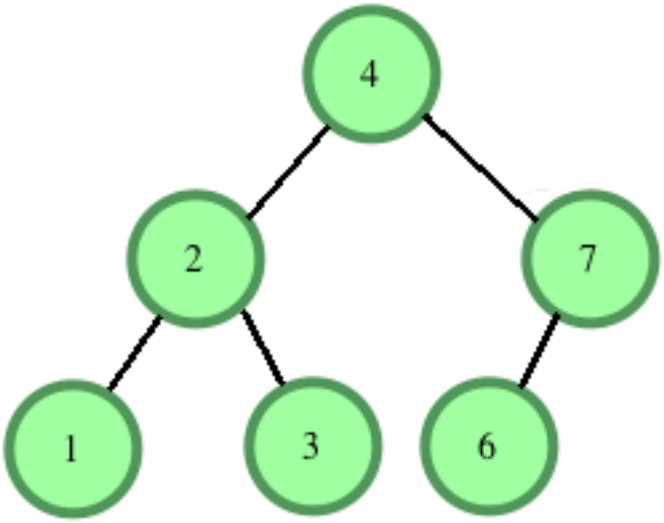
2. **Write an algorithm which can implement the top view for both the binary tree**



Output:
1->2->5->6

3. **Write an algorithm which finds Lowest Common Ancestor of 1 and 7 given nodes in a binary tree.**

   Testcase:



4. **Write an algorithm which perform swapping of the nodes with following condition:**

   Swapping subtrees of a node means that if initially node has left subtree L and right subtree R, then after swapping, the left subtree will be R and the right subtree, L.

   Input: