CL2001 – Data Structure Lab

Practice Task (UnGraded)

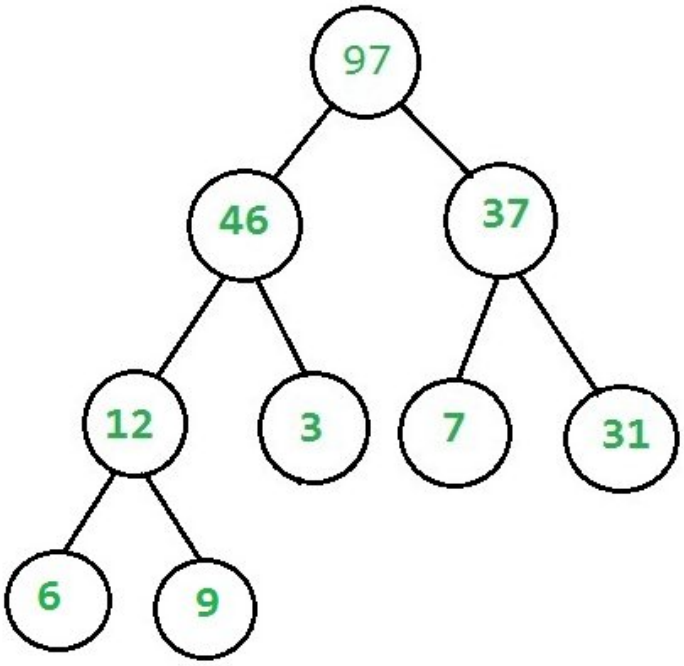
Problem: 1 | Check if a given Binary Tree is a Heap

Given a binary tree, we need to check it has heap property or not, Binary tree need to

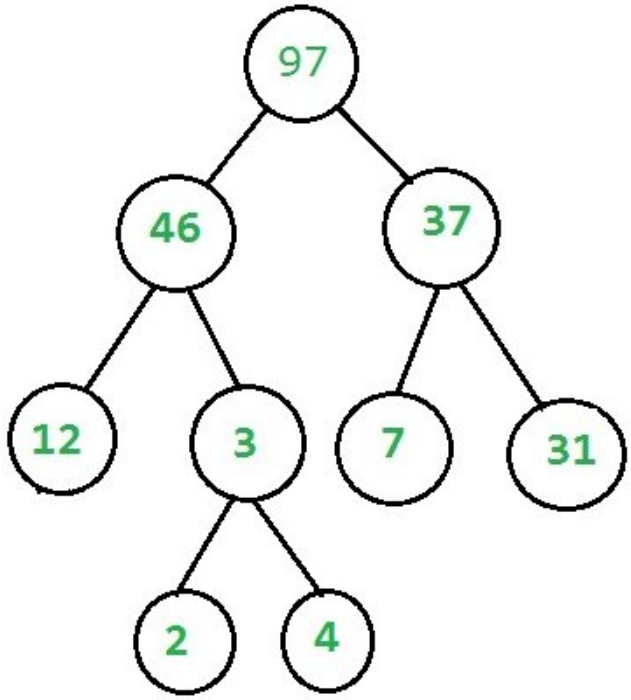
fulfill the following two conditions for being a heap –

1. It should be a complete tree (i.e. all levels except last should be full).
2. Every node's value should be greater than or equal to its child node (considering max-heap).

For example this tree contains heap property –



While this doesn't –



Detail about isComplete function can be found here.

isHeapUtil function is written considering the following things –

1. Every Node can have 2 children, 0 child (last level nodes) or 1 child (there can be at most one such node).
2. If Node has No child then it's a leaf node and returns true (Base case)
3. If Node has one child (it must be left child because it is a complete tree) then we need to compare this node with its single child only.
4. If the Node has both child then check heap property at Node at recur for both subtrees.

Problem: 2 | Merge BST

Write a C++ code that merge two BST.

Problem: 3 | Check if a binary tree is a sum tree or not

Given a binary tree, check if it is a sum tree or not. In a sum tree, each non-leaf node's value is equal to the sum of all elements present in its left and right subtree. The value of a leaf node can be anything and the value of an empty child node is considered to be 0.

For example, the following binary tree is a sum tree.