CS 111 Lab 12: Binary Trees

20 points

Goal: Test your understanding of Binary Trees

In this lab you will be implementing Binary Tree

A **binary tree** is a tree-type non-linear data structure with a maximum of two children for each parent (element). Every node in a **binary tree** has a left and right reference along with the data element. The node at the top of the hierarchy of a tree is called the root node.

Each node of a binary tree consists of three items:

- data item
- address of left child
- address of right child

Methods to implement:

preOrderTraversal()

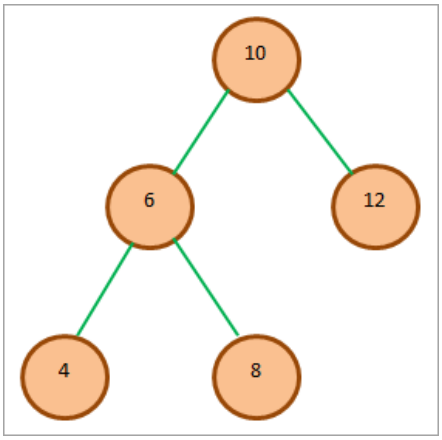
inOrderTraversal()

postOrderTraversal()

Traversal methods for the node-based Binary Trees

Binary tree traversal methods for this lab:, inOrder, preOrder and postOrder

Given a tree



The inorder traversal of the tree is:

4 6 8 10 12

Allows to see the sorted tree

1. Traverse the left subtree: inOrder (leftSubtree)
2. Visit the current node.
3. Traverse the right subtree: inOrder (rightSubtree)

The preorder traversal for the tree is:
10 6 4 8 12

Used to recreate the tree in the order that it was made

1. Visit the current node
2. Traverse the left subtree: preOrder (leftSubtree).
3. Traverse the right subtree: preOrder (rightSubtree)

The postOrder traversal for the tree is:
4 8 6 12 10

This is essentially going layer by layer – useful for deleting the tree from the bottom up

1. Traverse the left subtree: postOrder (leftSubtree).
2. Traverse the right subtree: postOrder (rightSubtree).
3. Visit the current node

Additional requirements:

- Name included at the top of your code
- Clean readable and commented code