Faculty of Engineering, University of Jaffna,

Department of Computer Engineering

EC4070: Data Structures and algorithms

Lab 05

Chapter 05: Trees

Duration: 3 Hours Lecturer: Ms. Sujanthika M.

Instructions

i. Submit the code files and screenshot of the outputs in a zipped folder by naming as 2022EAAA_Lab05(AAA – Your Registration Number)
ii. Submit your zip file before the given deadline.
iii. Any plagiarized work will be given 0 marks.

Binary Tree Implementation

Implement a **Binary Tree** with the following functionalities:

1. **Node Insertion:** Insert a node with value into the Binary Tree.
2. **Traversals:** Implement the following traversal algorithms:
    a. Inorder Traversal
    b. Preorder Traversal
    c. Postorder Traversal
3. **Search Functionality:** Search for a value in the tree and return whether it exists or not.
4. **Height Calculation:** Compute and display the height of the Binary Tree.
5. **Leaf Node Count:** Count and display the total number of leaf nodes in the tree.
6. **Deletion of a Node:** Delete a node from the Binary Tree while maintaining its structure.
7. **Tree Visualization:** Print the Binary Tree structure in a user-friendly format

Instructions

- Write the program to include all the above functionalities.
- Binary tree values, insertion node, search value, deletion node should come from the user.
- You are not allowed to use java packages to implement tree, you are expected to implement from scratch
- Provide sample input and output for each operation to demonstrate correctness.