
Theory I, Sheet 2

Submission: hand in by 25th May 2011 before 16:00

- The solutions should be submitted in English.
- You must work on your own and write down your own solution. This does not exclude occasional discussions with your fellow students, but solutions copied from other students will not be accepted.

Exercise 2.1 - Tree Traversal

[Points: 4]

Similar to the implementation of Preorder from the lecture complete the implementations of Postorder and Inorder accordingly.

Exercise 2.3 - Internal Path Length

[Points: 3]

Show that the internal path length $l(t)$ of a search tree t fulfils the property

$$l(t) \leq (1 + \text{height}(t)) \cdot \text{size}(t)$$

where $\text{size}(t)$ denotes the number of internal nodes of t .

Exercise 2.3 - Tree Traversal

[Points: 3]

Consider the following Java classes:

```
public class Node {
    int data;
    Node left;
    Node right;
}

public class Tree {
    private Node root;
    :
    public static void preOrder(Node n)
    { ... }
}
```

Complete the method `preOrder` using iterative programming. (no recursive calls are allowed).