# *Programming III (420-B31-HR)*

# *Lab 11 – Trees*

Date assigned: Tuesday, November 15, 2016

**Objectives:**

1. Become familiar with tree terminology.
2. Learn to traverse a binary tree using preorder, inorder, postorder and level order traversals.
3. Learn to add nodes to a binary tree.
4. Learn to use a visitor to traverse a binary tree.

**To Start:**

1. Copy the **B31\_L11\_Trees** folder from Moodle. Rename it to ***username*\_B31\_L11\_Trees**.
2. Start **Eclipse** and use your **420-B31\Labs** folder as your workspace.
3. Create a new **Java Project** called ***username*\_B31\_L11\_Trees**.

**To be handed in:**

## Your ***username*\_B31\_L11\_Trees** folder should be zipped and uploaded to **Moodle**.

**Marking Scheme:**

|  |  |  |
| --- | --- | --- |
|  | **Mark** | **Out of** |
| Moodle Tree Terminology Quiz |  | 21 |
| FolderTreeVisitor |  | 4 |
| FolderTree |  | 18 |
| **Total** |  | **43** |

# Introduction to Trees

**Objectives:** Become familiar with tree terminology.

**To Do:**

## Do the **Lab 11 Tree Terminology Quiz** on Moodle.

# Binary Trees

**Objectives:** Learn to add nodes to a binary tree and to use a visitor to traverse the tree.

**To Do:**

## Create an implementation of the **Visitor** interface called **FolderTreeVisitor**. The visit method should simply print the element at the node.

## Create a class called **FolderTree**. The class diagram is shown in appendix I.

The **createTree()** method should create a binary tree of strings representing the folder structure shown here.



The **listDirectories()** method should use one of the binary tree traversal methods to display the tree in the following order:

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The **main()** method should instantiate **FolderTree** object and execute the **createTree()** method and then the **listDirectories()** method.

# Assignment 4

**Objectives:** Ensure that you understand the final assignment.

**To Do:**

**\*Note: the marks from this section are applied to your final assignment, not the lab**

## Draw, on paper, the first draft of your class diagram.

## Write the pseudocode for the following methods:

MorseCodeTree() constructor, which creates the tree from the file

encode()

decode()

visit()