School of Computer Science, University of Windsor
60-141: Introduction to Algorithms and Programming II
Term: Summer 2014 (July-August)
Instructor: Dr. Asish Mukhopadhyay

Lab 5
Posted: 01 August, 2014
Due: End of lab period or earlier, whenever you finish

Preamble: This lab is designed you help grasp the idea of non-linear lists, in particular, binary trees. This will require a thorough understanding of linked lists discussed in the lectures. Each one of the programs should be properly commented, following the style of your textbook. All lab work is expected to be original.

Grading Scheme: This lab is worth 20 points. 4 points for program documentation, 4 points for effort and 12 for correctness.

Credits: The idea of this lab has been conceived by me.

Problem. This lab is a continuation of lab 4 in the sense that the problem input remains the same, viz., a text file and the output again is a table that lists the distinct words in the file and their corresponding frequencies of occurrence.

However, this time you shall use a binary tree to keep track of the words that are read in. As explained in class, each new word that is read is in, is compared lexicographically with the word at the root and is stored in the left subtree if it is smaller and in the right subtree if larger; if it is identical with the word at the root, the frequency count of this word is incremented by 1. If the word does no exist this will be discovered, when you will have to create a new node and suitably link it to its parent in the binary tree.

Once the file is completely read, traverse the tree in some order (inorder, preorder or postorder) to output the words and their frequency counts. You can use the `printTree` routine from the lecture slides.

Use the program modules in the lecture slides on dynamic data structures to put together a fully functional program. This time around you will create an input text file using a text editor, and

open it for reading in your program, and closing it when done.

(20 points)