**C243 – Assignment 7**

**Binary Trees**

**Due Date: Thursday, March 21st, 2013, by 9:30pm.**

**Introduction:** In this assignment, you will get experience manipulating a binary tree. Create a new folder **ass7** under your **c243** folder. Copy **bin-trees-A.cc** and **tree.txt** to your **ass7** folder from my folder:

/home/mscheess/c243s13/p7

* **Hand in hardcopy of bin-trees-A.cc.**
* **Upload bin-trees-A.cc to Oncourse Dropbox.**
* **Hardcopy and dropbox copy are due by 9:30pm on the due date.**
* **Test thoroughly, but no test runs are required to be handed in. I will use my own testing script on your program.**

To compile, type:

g++ -o bintree bin-trees-A.cc

First, run bintree interactively, by typing the command:

bintree

It has a menu of options. You will need to write the code for most of the items on this menu:

Which of the following actions do you wish to take?

B)uild or modify the current tree interactively.

C)ount and report number of zero data values in current tree

D)estroy the current tree.

H)eight of the tree -- determine it.

I)ncrement every data value in the current tree by 1.

P)rint the current tree on the screen.

Q)uit.

R)eplace the current tree by its mirror image.

S)um the negative data values in the current tree.

You must write the code for options C, D, H, I, R, S.

(Look at the source code, bin-trees-A.cc. You will find function stubs for these six options. You need to write and test the actual functions for these six options.)

Test your code with several representative cases (i.e. binary trees), but especially test it with the binary tree pictured on the attached sheet (the one titled “Original image”). Rather than interactively typing in this tree each time you want to perform a test, simply use redirection with the test script file provided:

bintree < tree.txt

To test one of your six options, you can add a command (or commands) just before the ‘q’ which is on the last line in tree.txt. Because output will scroll up the screen really fast (there will be several screens of it), you can log the output like this:

bintree < tree.txt > res.txt

(This will cause output to go to the file res.txt rather than to your screen.)