CSE 5311 Lab Assignment 1

Due June 18, 2003

Goals:

1. Review of binary search trees.

2. Understanding of randomized search trees (treaps).

Requirements:

1. Write (and test) a program that performs 10 cases of the following computation: 1. Generate a random permutation of the values 0 .. 999999, 2. insert the keys into the treap, 3. delete the odd-valued keys (ascending order) from the treap. Your program must compile and execute on OMEGA. There should be a comment near the beginning of your code that indicates how to compile on OMEGA.

2. Email your code (as attachments) to `yxb4544@omega.uta.edu` before 3:00 pm on June 18. The subject should include your name as recorded by the University.

Getting Started:

1. You may borrow from the code at `http://www.cs.fiu.edu/~weiss` (or other places besides each other), but be sure to give appropriate credit in your comments.

2. You should include code to produce the following:

    a. Number of rotations in performing the insertions for each permutation.
    b. Number of rotations used for performing the sequence of deletions on each tree.
    c. Maximum depth and average depth for the nodes after the insertions and after the deletions.
    d. Print the priorities on five random paths to leaves after the insertions and after the deletions. (Coin flip to decide which direction to go.)

3. You should use a ‘‘free list’’ (similar to CLRS, p. 211) to avoid excessive memory management costs.