Christopher Chapline
Tyson H
Section 3
Assignment 9, CSc 227, Spring 2013

Timing Report

All tests performed in this report were performed using the machine 'harpsichord'. The uptime report on the machine, connected to via lectura is as follows:

```
17:19:15 up 5 days, 10:15,  1 user,  load average: 0.07, 0.07, 0.05
```

- The linked list tests were performed using the LinkedList class provided within the java.util package.
- The binary search tree tests were performed using the BinarySearchTree file provided by Patrick Homer

The tests were conducted in the following way:

1. The words from the file were read into an ArrayList
2. For each subsequent data structure, an enhanced for loop was used to add them
3. The timing was recorded and output at the end of each test.

The tests were automated for all files through use of a bash script that would call the Comparison class with the subsequent file and then piped all data into a text file. The data from the tests follows below:

The average construction time of a binary search tree was 69.6 milliseconds.

File Name	Binary Search Tree Creation ()
mobydick-sorted.txt	93 milliseconds
mobydick.txt	99 milliseconds
mohicans.txt	27 milliseconds
musketeers-sorted.txt	94 milliseconds
musketeers.txt	95 milliseconds
sawyer-sorted.txt	40 milliseconds
sawyer.txt	39 milliseconds

The average traversal time while using String was 40.1 milliseconds per traversal

File Name	Binary Search Tree Traversal (String)

mobydick-sorted.txt	55
mobydick.txt	50
mohicans.txt	26
musketeers-sorted.txt	43
musketeers.txt	45
sawyer-sorted.txt	31
sawyer.txt	31

Using StringBuilder yielded an average performance increase of 35 milliseconds, yielding an average traversal time of 4.9 milliseconds per traversal.

File Name	Binary Search Tree Traversal (StringBuilder)
mobydick-sorted.txt	6 milliseconds
mobydick.txt	8 milliseconds
mohicans.txt	4 milliseconds
musketeers-sorted.txt	4 milliseconds
musketeers.txt	4 milliseconds
sawyer-sorted.txt	4 milliseconds
sawyer.txt	4 milliseconds

Tests showed that when creating an ordered linked list, the performance difference between sorted and

unsorted files yielded no discernable difference. The average creation time was 23 milliseconds.

File Name	Creation of Ordered Linked List
mobydick-sorted.txt	31 milliseconds
mobydick.txt	31 milliseconds
mohicans.txt	11 milliseconds
musketeers-sorted.txt	24 milliseconds
musketeers.txt	24 milliseconds
sawyer-sorted.txt	20 milliseconds
sawyer.txt	20 milliseconds

The time spent traversing the linked list was almost negligible. It required, on average, 1.3 milliseconds.

File Name	Traversal of Linked List
mobydick-sorted.txt	1 millisecond
mobydick.txt	1 millisecond
mohicans.txt	3 milliseconds
musketeers-sorted.txt	1 millisecond
musketeers.txt	1 millisecond
sawyer-sorted.txt	1 millisecond
sawyer.txt	1 millisecond