Assignment #3 Analysis document

1. Who is your programming partner? Which of you submitted the source code of your program? Make sure to state your partner's name is the same way the name is given in Canvas.

My programming partner was Steven Sun. Steven submitted the source code of the program.

2. How often did you and your programming partner switch roles? Would you have preferred to switch less/more often? Why or why not?

We switched roles twice during the project. I think this is just the right number of switching for me, if feels like more would interrupt the flow of project too much, while less would make pair programming inefficient.

3. Evaluate your programming partner. Do you plan to work with this person again?

My programming partner is a very intelligent person with a clear thought process. He was very helpful throughout the project, and provided

4. If you had backed the sorted set with a Java List instead of a basic array, summarize the main points in which your implementation would have differed. Do you expect that using a Java List would have more or less efficient and why? (Consider efficiency both in running time and in program development time.)

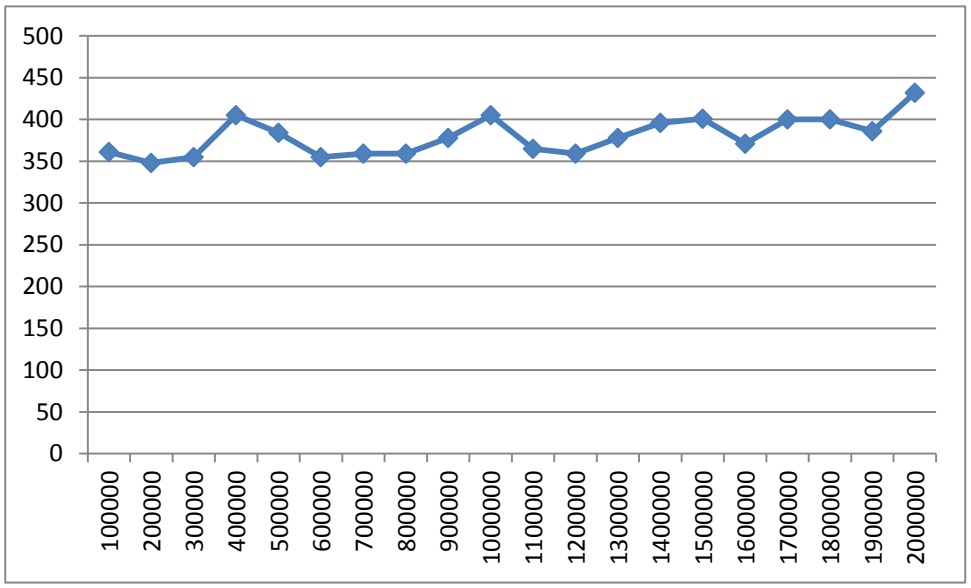
We would have had to use the List methods such as add(), isEmpty() etc, instead of checking for null, or setting E[i] to an object. I expect Java List to be more efficient for coding purposes, as it is more flexible to code around, while having similar run times compared to arrays, maybe a bit less efficient, but not by much, since we are

calling more methods.

5. What do you expect the Big-O behavior of MySortedSet's contains method to be and why?

Log N, since it runs a binary search.

6. Plot the running time of MySortedSet's contains method for sets of sizes 100000 to 2000000 by steps of 100000. Use the timing techniques demonstrated in Lab 1. Be sure to choose a large enough value of timesToLoop to get a reasonable average of running times. Include your plot in your analysis document. Does the growth rate of these running times match the Big-oh behavior you predicted in question 5?



The rate does match the rate of log(N) reaching threshold.

7. Consider your add method. For an element not already contained in the set, how long does it take to locate the correct position at which to insert the element? Create a plot of running times. Pay close attention to the problem size for which you are collecting running times. Beware that if you simply add N items, the size of the sorted set is always changing. A good strategy is to fill a sorted set with N items and time

how long it takes to add one additional item. To do this repeatedly (i.e., timesToLoop), remove the item and add it again, being careful not to include the time required to call remove() in your total. In the worst-case, how much time does it take to locate the position to add an element (give your answer using Big-oh)?

It should take log(N) to find the correct position by using a binary loop.

Worst case should take N log(N).

8. How many hours did you spend on this assignment?

We spent around 3 to 4 hours on this assignment.