

Analysis Document Assignment #3

1. Who is your programming partner? Which of you submitted the source code of your program?

My partner was Christian Luciani. I submitted out code.

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

Christian and I do most of our work separately, but collaborate using Saros and Git. Him and I both did a equal amount of each role. When we do meet in person to work together, we share the roles evenly as well. I didn't have any preference on when to switch roles. The project felt very balanced.

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

Our schedules are a bit tough to align, but there is no issue working with Christian. I plan to work with him again. He always makes sure to do put in effort on each assignment.

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.)

If the sorted set was backed with a Java List, this assignment would have been different. Adding and removing elements would be easier, and I believe it wold take less resources. I feel it would have taken me a lot less time if Java list were allowed on this assignment as well.

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

The behavior of the contains() method should be $n \log n$ since it uses a binary search algorithm.

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?

I wasn't sure how to run these plots. I will try again later to see if I can get it to work.

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)?

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

This assignment took a lot of time. I spent probably 15-20 hours on this. Some of my work was lost and I had to start over with my partner, which was frustrating.