When you are satisfied that your program is correct, write a brief analysis document. The analysis document is 30% of your Assignment 3 grade. Ensure that your analysis document addresses the following.

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

My programming partner is Arianne Grimes. She submitted the source 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?

My partner and I switched roles approximately half the time. Every day we would switch from driver to navigator. I would not change anything.

3. Evaluate your programming partner. Do you plan to work with this person again?
My programming partner did great. I wouldn’t change a thing.

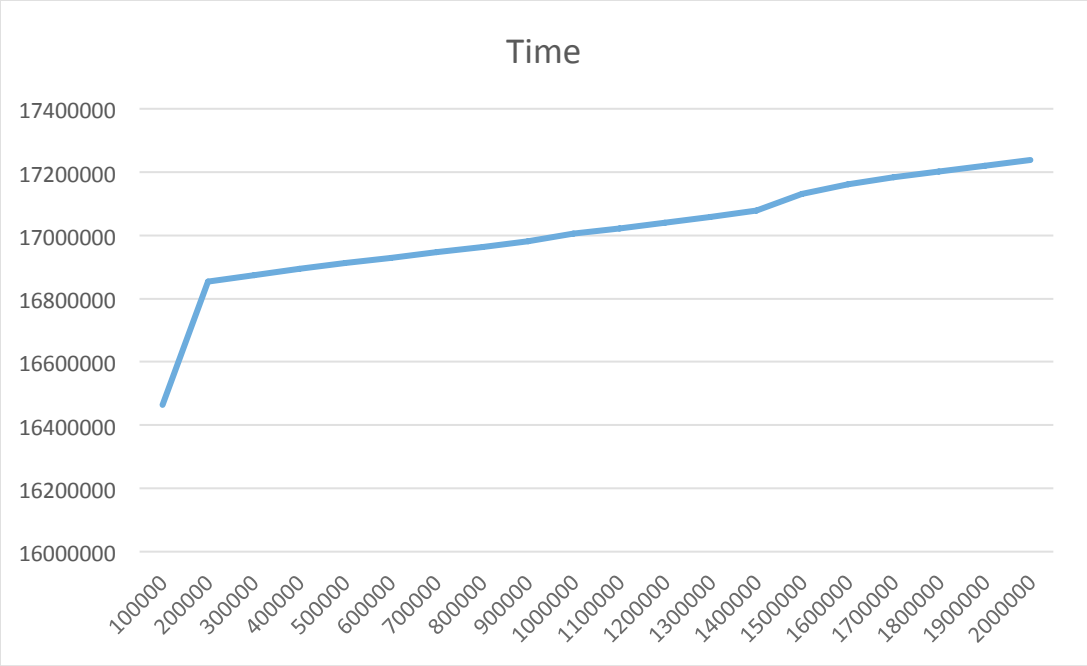
4. If you had backed the sorted set with a Java List instead of a basic array, summarize the main points in which your implementation would have differed. Do you expect that using a Java List would have more or less efficient and why? (Consider efficiency both in running time and in program development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

A Java List would be much easier to implement due to the fact that it has methods like remove(), isEmpty(), add() and every other useful function. This would make the implementation a lot less time consuming but the run time would be approximately the same. The only place where time would be saved is in the implementation of the methods added to the basic array.

5. What do you expect the Big-O behavior of MySortedSet's contains method to be and why?
I would expect a log base N for the contains method. Since the contains method uses the binary search it cannot be linear or constant or quadratic.

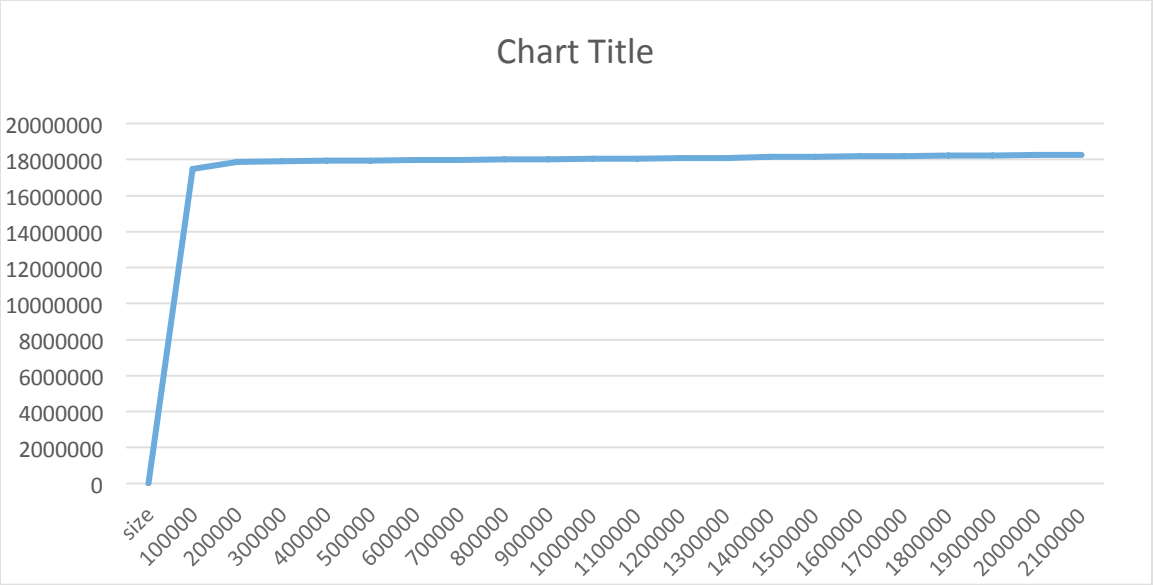
6. Plot the running time of MySortedSet's contains method for sets of sizes 100000 to 2000000 by steps of 100000. Use the timing techniques demonstrated in Lab 1. Be sure to choose a large enough value of timesToLoop to get a reasonable average of

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?



We expected the log base N graph and got the log base N graph, exactly like we predicted.

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)?



8. How many hours did you spend on this assignment?
We spent approximately 22 hours on this project.

Programming partners are encouraged to collaborate on the answers to these questions. However, each partner must write and submit his/her own solutions.

Upload your document (.pdf only!) to the Assignment 3 page by 11:59pm on February 5.