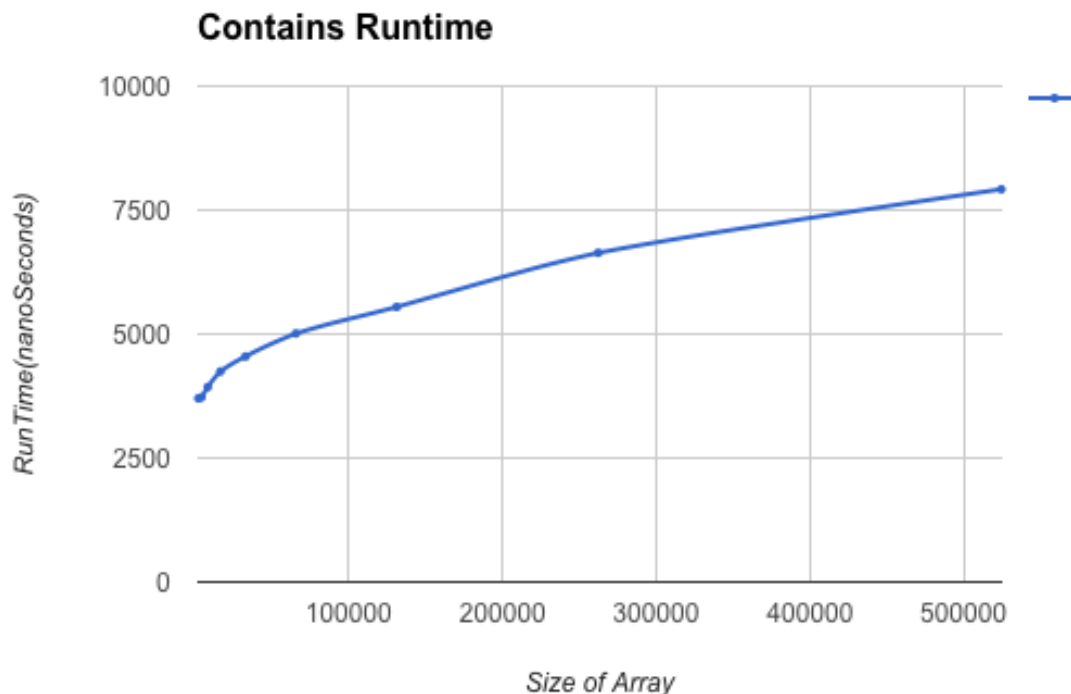


Assignment 03 Analysis Document

1. My programming partner is Min Kim, I will be the one submitting the source code.
2. We switched roles about every hour. I think this is a good timing to switch, because I think 30 minutes is too short, when we are stuck on a problem, it gave us more time to think about the question and not be interrupted with switching roles.
3. Min is a great partner, she keeps an eye on the code that I was writing and will correct me if I type something wrong and discuss the issue with me. I would totally work with her again.
4. If we have blackened the sorted set with java list it will be so much more efficient. I would not have to write the add method and I would not have to write the binary search. Also I would not need to move the elements for remove as well, I can just call the remove method in the java list.
5. I expect the Big-O notation of binary search to be $O(\log N)$ because when we are searching through the array, we cut the list in half and half so we do not have to go through every element in the array.
- 6.

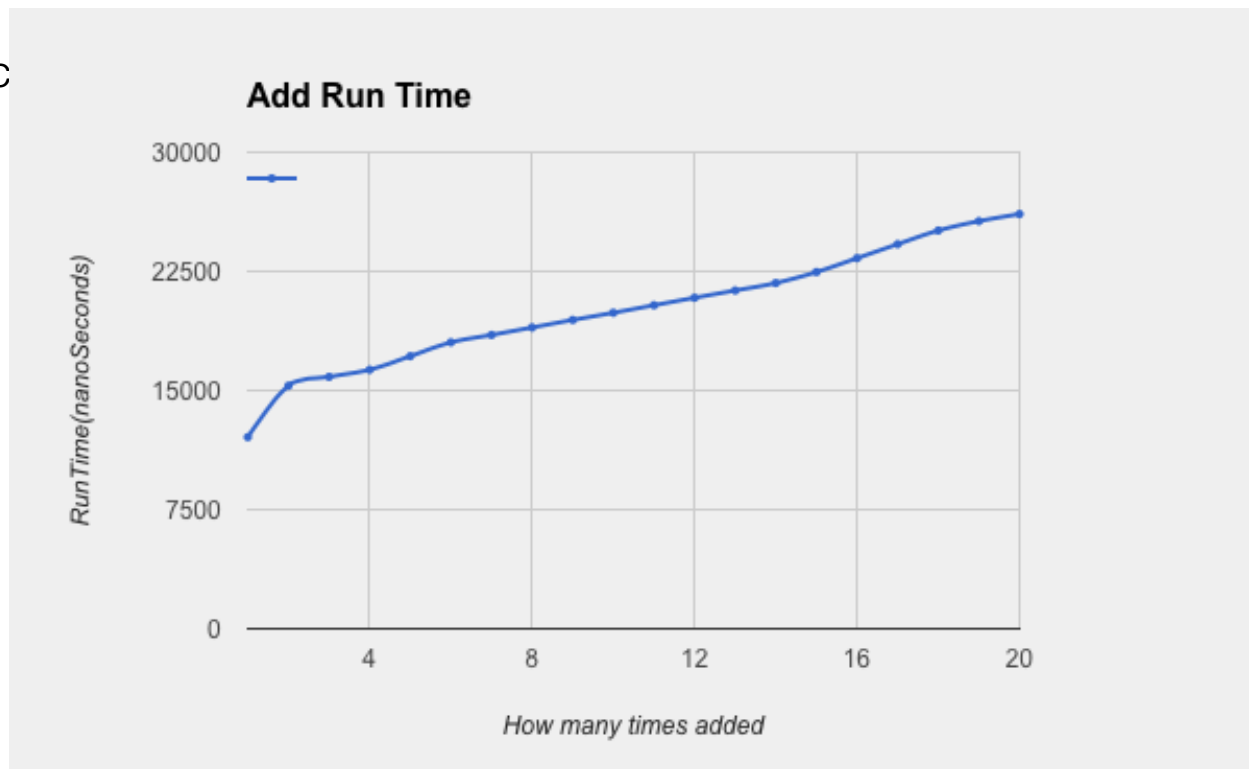


As you can see from the graph above, the Big O complexity is $O(\log N)$. To time the contains method, created different size of array, and run the contains methods on a random number from 0 to the size of array a couple of times and find the average run time. As you can see from above, our run time is just as how we have predicted in question 5.

7.

For our add run time method, we created an array of size 10000 and then I remove a number from the array. I add the number back in and remove it(repeat this step for 20 times). As you can see from below, the runtime seems to be $O(\log N)$ which is what it is suppose to be for the worst case. for the worst-case the number will either be 0 or 10000 so it will keep searching until the very end, but because we are using binary search in our add method, and the search run time is $O(\log N)$ the run time of our add method will be the same. For the best case, the run time will be $O(c)$.

C



8. We approximately spent 5 hours on this assignment.