

**Assignment 3 Analysis**

1. My partner is Naoki Tominaga. I will be the one submitting the file.
2. I did a little bit more typing, but for the most part it was a fairly even spread.
3. We both bounce ideas off each other really well. I plan on continuing to work with him.
4. The java list grows automatically, which would have saved some memory over the basic array. However, this would have come at the cost of a little bit of speed due to it always having to go through the function of growing when new things are added or removed, whereas the basic array only goes through that function when it is needed, and then not for awhile after. Also, there are more functions associated with java lists, making them more convenient to program.
5. Due to the contains method consisting of only a while loop with a binary search, the big O notation would be  $\log N$ . The formula for determining a new center point (pos) in the list goes as follows:  
  
If the number being searched for is greater than 'pos', then set 'min' to 'pos'.  
  
If the number being searched for is less than 'pos', then set 'max' to 'pos'.  
  
Then, set the new 'pos' to  $((\text{max} - \text{min}) / 2) + \text{min}$   
  
Finally redo the loop until the answer is found.
6. We did not finish and could not run timing simulations.
7. Because the binary search already found the proper location in the array, the sorting of the new item into the list happens at the rate of N. The program simply moves the dominant items to the right one by one until the position of the new item is reached, leaves it empty, and then adds it.
8. We spent approximately 15 hours on this assignment.