**CSE 212 – Programming with Data Structures**

**W02 Prove – Response Document**

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**Question 1: From Part 1, what is the big O notation for the SortArray function?**

O(n^2)

**Question 2: From Part 1, what is the big O notation for the StandardDeviation1 function?**

O(n + n) or (2n)

**Question 3: From Part 1, what is the big O notation for the StandardDeviation2 function?**

O(2n^2)

**Question 4: From Part 1, what is the big O notation for the StandardDeviation3 function?**

O(n log n)

**Question 5: Put the following big O notations in order from best performance to worst performance: O(n^2), O(1), O(2^n), O(n log n), O(log n), O(n).**

**O(1), O(log n), O(n), O(n log n), O(n^2), O(2^n).**

**Question 6: From Part 2, what is the performance (using big O notation) for the SearchSorted1 function?**

**O(n^2) (to be honest, I’m a little confused by this question)**

**Question 7: From Part 2, what is the performance (using big O notation) for the SearchSorted2 function?**

O(log n)

**Question 8: From Part 2, which function (SearchSorted1 or SearchSorted2) has the better performance?**

SearchSorted2

**Question 9: From Part 2, for both functions (SearchSorted1 and SearchSorted2), explain in detail how you determined the big O notation by just looking at the code without the benefit of observing actual execution results?**

I saw that there were only two things passed into SearchSorted1 and had to assume that it was either an imbedded for loop or a linear process. The more complicated SearchSorted2 used the length and I assumed that it was for a logarithmic function, which is almost always faster.

**Question 10: From Part 2, it is possible in the best case for each of these functions (SearchSorted1 and SearchSorted2) to complete in O(1) time even if the size of the list was very large. What input scenarios would give this result for both functions?**

**Honestly, I’m not sure. The numbers in the list being smaller might change things, or some of the operations changing in the functions themselves. The middle or average value of the list being passed in might also help it run faster and smoother.**