**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 sort\_list function?** O(N^2)

**Question 2: From Part 1, what is the big O notation for the standard\_deviation\_1 function?** O(N)

**Question 3: From Part 1, what is the big O notation for the standard\_deviation\_2 function?** O(N^2)

**Question 4: From Part 1, what is the big O notation for the standard\_deviation\_3 function?** O(N)

**Question 5: From Part 1, 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 search\_sorted\_1 function?** O(n)

**Question 7: From Part 2, what is the performance (using big O notation) for the search\_sorted\_2 function?** O(log n)

**Question 8: From Part 2, which function (search\_sorted\_1 or search\_sorted\_2) has the better performance?** Search\_sorted\_2

**Question 9: From Part 2, for both functions (search\_sorted\_1 and search\_sorted\_2), explain in detail how you determined the big O notation by just looking at the code without the benefit of observing actual execution results?** For search\_sorted\_1 I noticed it has a single loop that iterates through each element in the list. All the other code just either does a simple calculation, setup, or display so they each get O(1) thus the Big O is O(n). As for the search\_sorted\_2; it cuts out half to of the list each time the function is called. This significantly shortens the data being worked and gives it a Big O(log n). Again the other statements in the function equate to a O(1) at worst.

**Question 10: From Part 2, it is possible in the best case for each of these functions (search\_sorted\_1 and search\_sorted\_2) 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?** 1