**CSE 330 Lab Report # 2**

1. I’ve completed 100% of the lab.

2. Complexity Analysis

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| --- | --- | --- | --- |
| **File Name** | **Function** | **Time**  **Complexity** | **Storage**  **Complexity** |
| Selectionsort.cpp | Main() | O(n) | O(n) |
| Selectionsort.cpp | Sort() | O(n2) | O(1) |
| Bubblesort.cpp | Main() | O(n) | O(n) |
| Bubblesort.cpp | Sort() | O(n2) | O(1) |
| Insertionsort.cpp | Main | O(n) | O(n) |
| Insertionsort.cpp | Sort() | O(n2) | O(1) |

**Explanation:** Each of the main() functions above are in O(n) time because at the most, you will only go through the loop N times. Even though you go through two For loops, they are separate loops, so the max time is still O(n). For each sort() function above, we were able to prove that the time complexity is O(n2). This is because in a worst case scenario, you will process through the data n2 times because you have a For loop inside of another For loop. If both loops always process n times, then you’d get a max amount of times of n2.. We were able to prove that in this lab because for any size N, the time it took to process run the program could be explained in a formula with a constant value. We showed that the constant is the same for all sizes of N, so that proves that it’s O(n2) time.

3. See attached for source code