Student Name: Noah Cherry

Grader Name: Raj Singh

CSE 122 – Black Box Time Complexity Project

Problem	**Points Given**	**Points Total**
Part I: Functions and Complexity **Students should have a summary PDF containing the following:** • **Complexity -- (3 pts)** • **Graph with trendline -- (5 pts)** • **c-vlaue and Asymptotic Standard Error -- (2 pts)**	-	-
function_1: • Complexity: O(n^3) • Graph with trendline • c-vlaue and Asymptotic Standard Error	10	10
function_2: • Complexity: O(2^n) • Graph with trendline • c-vlaue and Asymptotic Standard Error	10	10
function_3: • Complexity: O(n*log(n)) • Graph for sorted, reverse-sorted, and shuffled with trendlines • c-vlaue and Asymptotic Standard Error	10	10

function_4 • Complexity: O(n) • Graph with trendline • c-vlaue and Asymptotic Standard Error	10	10
function_5: • Complexity: O(log(n)) • Graph with trendline • c-vlaue and Asymptotic Standard Error	7	10
function_6: • Complexity: O(n^2) • Graph for sorted, reverse-sorted, and shuffled with trendlines • c-vlaue and Asymptotic Standard Error	10	10
function_7: • Complexity: O(n!) • Graph with trendline • c-vlaue and Asymptotic Standard Error	10	10

Part II: Code **The student's code should demonstrate the following:** • Correctly timed each function **(15 pts)** ○ Tests at least 5 values of n for each function **(4/15 pts)** ○ Times each n value at least 3 times to get an average **(4/15 pts)** ○ Correctly converts time **(3/15 pts)** ■ msec = time_elapsed * 1000 / CLOCKS_PER_SEC; ○ For functions that take in a list, the student must time and analyze sorted, reverse-sorted, and shuffled lists independently. **(4/15 pts)** ■ This means they used 5 n vlaues, and three trials per n value for EACH type of list. • Correctly generated sorted, reverse-sorted, and shuffled lists. **(5 pts)** ○ For the shuffled lists, the student should have used the random_number() function in the PDF to generate large random numbers. This function is then called in the shuffling algorithm (described just above random_number() in the PDF) in place of random() to shuffle a huge list of numbers. **(3/5 pts)** ○ For the sorted and reverse sorted, the student should have just filled an array with a for loop. **(2/5 pts)** • Student included a vlagrind script showing no memory leaks. **(5 pts)** • Student's code was well-commented **(5 pts)**	25	30
Total Score	92	100

Comments:

(-3) Function 5 is O(log(n))

(-2) Incorrect way of calculating time in milliseconds, see above for how you should have done it.

(-3) Commenting. You didn't have doxygen comments for any functions, or hardly and in-line comments.