BCSE 204 P- Design and Analysis of Algorithms
In-lab Practice Sheet 1

Practice makes you Perfect

1. Given a sequence of n numbers (real or integers) and a number k (k is one among the n numbers), write an algorithm and the corresponding code to compute the position of k if the given n numbers are arranged in an increasing order, using insertion-sort. If the 2, −1, 3, 0, 7 and 3 are the input , your program should output 4 since 3 will be in the fourth position (starting from 1), in the sorted (increasing) order. You are expected to code the problem two different ways, say, c_1 , c_2 using two different approaches. Decide whether c_1 is efficient or c_2 is efficient based on the running time T (n) of the resepctive codes.

2. Given a sequence of n numbers (real or integers), write an algorithm and the corresponding code to arrange the given n numbers are arranged in such a way that all the negative numbers (if any) are arranged in a descending order and all the positive numbers are arranged in an increasing order with zero (if it is in the input) appearing between the smallest negative number and the smallest positive number. If 7, 3, 2, 4 the output should be 2, 3, 4, 7. If −7, −3, 2, 4 the output should be −3, −7, 2, 4 should be the output. If 7, 3, −1, 0, 2, 4 the output should be −1, 0, 3, 4, 7.