COSC 3304 – Algorithms Design and Analysis

Assignment 3

Due: 23:59:00pm, 02/06/2024

1. (30 points) Please show the big O notation of the recurrence relation below using the substitution method (please show detailed steps):

$$T(n)=T(n^{1/2}) + 3 \text{ (Base case } T(2))$$

2. (20 points) An array contains a descending subarray followed by an ascending subarray. Please write a pseudocode to find the minimum element in the array using O(logn).

3. (20 points) Write a pseudo code function *m(i)* to compute the following series using a recursive method.

$$m(i) = 1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\cdots+\frac{1}{i}$$

4. (15 points) Please sort the input array [9 -9 15 35 -1 14 20 7] using the **INSERTION** algorithm (please show detailed steps for full credits).

5. (15 points) Please sort the input array [9 -9 15 35 -1 14 20 7] using the **BUBBLESORT** algorithm (please show detailed steps for full credits).