**CS4306 Algorithm Analysis**

Fall 2021

Department of Computer Science

Kennesaw State University

**Programming Assignment 2**

**Due Date: Tuesday, September 14, 2021 (by 11:59pm)**

Report

My Anh Huynh

You have been given Java implementation of some sample typical array processing starter code.

1. First, run the code "as it is", without any modification of the Java code.
2. Attach screen shot of successful run

Graphical user interface, text, application, email

Description automatically generated

1. Re-write all the functionality using C/C++

Text

Description automatically generated

Text

Description automatically generated

Text

Description automatically generated

Text

Description automatically generated

Text

Description automatically generated

1. Again attach scree shot of successful run

Text

Description automatically generated

5. For each operation, analyze running time in terms of Big Oh/Theta  notation:

Text

Description automatically generated

It runs the first time 1 time whenever it is called, and runs the things in the for loop n times. Overall, it runs cn+1 where c is the numbers of thing in the for loop. Hence, this simplifies to O(n) because the cn is the largest term.

Text

Description automatically generated

It runs the first time 1 time whenever it is called, and runs the things in the for loop n times. Also, number iteration by inner loop:n

So n\*n+1= O(n^2)

Text

Description automatically generated

It runs the first time n time whenever it is called, and runs the things in the for loop n times.

Also, the number of iteration by inner loop is n.

Hence, n+ n\*n= O(n^2)

Graphical user interface, text, application

Description automatically generated with medium confidence

Loop1 is running for i value from 0 to n with increment of 1 so loop1 is running n times.

Loop2 will do the same so O(n\*n)= O(n^2)

Text

Description automatically generated

Loop1 is running for i value from 0 to n/2 with increment of 1 so loop1 is running n/2 times.

Loop2 is running for I value from 0 to n so running n times.

Loop 3 and loop4 is running n time so

n/2 ( n\*(n+n))= (n/2)\*( n\*2n)= O(n^3)

Graphical user interface, text

Description automatically generated

The first loop is running time 1. The for loop is running (n^(1/2)) times so O(n^(1/2))

Text

Description automatically generated

The loop1 running time is n.

The loop2 is running time is n.

Lastly, the loop3 running time is n

Hence, O(n^3)

6. Submit just ONE pdf file that will have everything in it (modified code, screen shot, analysis etc.)