Homework 01 (Due: Wednesday, September 27, 2023, 11 : 59 : 00PM (Eastern Time))

CPSC 3120

Instructions

This assignment consists of 6 analytical problems and 2 programming problems. Your solutions to the analytical problems must be submitted, as one PDF **without spaces, tabs, parentheses, pound signs, or percent signs in the filename**, via Canvas. While handwritten (then scanned) solutions to the analytical problems are acceptable, you are strongly encouraged to typeset your solutions in LaTeX or a word processor with an equation editor. The legibility of your solutions is of great importance.

Programming Assignment

Your methods will be tested on `newton.computing.clemson.edu`, using
`gcc version 9.4.0 (Ubuntu 9.4.0-1ubuntu1~20.04.1)` and be compiled for C++ 2017. To ensure proper execution, you should review the reports that will be sent back to you on Canvas

You will submit `cpsc3120hw01pt01.h`, `cpsc3120hw01pt02.h`, `cpsc3120hw01pt01.cpp`, and `cpsc3120hw01pt02.cpp`, along with your PDF, via Canvas.

`maxSubSlow`, `maxSubFaster`, and `maxSubFastest`

`maxSubSlow`, `maxSubFaster`, and `maxSubFastest` are functions that should take a vector of integers and return an integer. The value returned is the maximum sum of consecutive integers $(a_i + a_{i+1} + \cdots + a_{j-1} + a_j)$ in the vector. The functions should be corresponding implementations of Algorithms 1.14, 1.15, and 1.16 in *Algorithm Design and Applications*.

`removeEvens`

`removeEvens` is a function that should take a reference to a vector of n integers as input and remove the even integers from it. The remaining odd integers should be arranged in the same order that they were (relative to each other) originally.

General Guidelines

Sample header, source, and testing files have been provided. You may modify the `.h` and `.cpp` files as needed, but you will only be turning in the four files mentioned above. The grading system will be compiling the code with the command
`g++ -std=c++17 -o /path/to/executable.out /path/to/source/files/*.cpp` for each part.

Written Assignment

Question 1 (10 points)
Question R-1.7 in *Algorithm Design and Applications*

Question 2 (10 points)
Question R-1.8 in *Algorithm Design and Applications*

	1 Second	1 Hour	1 Month	1 Century
$\log n$	$\approx 10^{300000}$			
$\sqrt{n}$				
n				
$n \log n$				
n^2				
n^3				
2^n				
$n!$		12		

Question 3 (10 points)
Question C-1.1 in *Algorithm Design and Applications*

Question 4 (10 points)
Question C-1.2 in *Algorithm Design and Applications*

Question 5 (10 points)
Question C-1.3 in *Algorithm Design and Applications*

Question 6 (10 points)
Question C-1.8 in *Algorithm Design and Applications*

Automated Report Notes

Reports will be generated every 5 minutes. Your programs should terminate within 60 seconds.

Point Allocation

Question	Points
Question 1	10%
Question 2	10%
Question 3	10%
Question 4	10%
Question 5	10%
Question 6	10%
`cpsc3120hw01pt01` Compilation	6%
`maxSubSlow`	
Test Cases	$7 \times 1\%$
`maxSubFaster`	
Test Cases	$7 \times 1\%$
`maxSubFastest`	
Test Cases	$7 \times 1\%$
`cpsc3120hw01pt01` Total	27%
`cpsc3120hw01pt02` Compilation	6%
`removeEvens`	
Test Cases	$7 \times 1\%$
`cpsc3120hw01pt02` Total	13%
Total	100%