

Homework 01 (Due: Wednesday, February 5, 2025, 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 L^AT_EX 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 9.4.0-1ubuntu1~20.04.2) 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 `cpssc3120homework01part01.h`, `cpssc3120homework01part02.h`, `cpssc3120homework01part01` and `cpssc3120homework01part02.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 ($a_i + a_{i+1} + \dots + a_{j-1} + a_j$) in the vector. The functions should be corresponding implementations of Algorithms 1.14, 1.15, and 1.16 in *Algorithm Design and Applications*.

`removeConsonants`

`removeConsonants` is a function that should take a reference to a `string` as input and remove the consonants from it. The remaining letters should be arranged in the same order that they were (relative to each other) originally. For our purposes, `Y` and `y` are not vowels.

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
$\log n$	$\approx 10^{3000000}$			
\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 3 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%
cpsc3120homework01part01 Compilation	6%
maxSubSlow	
Test Cases	$7 \times 1\%$
maxSubFaster	
Test Cases	$7 \times 1\%$
maxSubFastest	
Test Cases	$7 \times 1\%$
cpsc3120homework01part01 Total	27%
cpsc3120homework01part02 Compilation	6%
removeConsonants	
Test Cases	$7 \times 1\%$
cpsc3120homework01part02 Total	13%
Total	100%