Homework 03 (Due: Wednesday, April 2, 2025, 11 : 59 : 00PM (Eastern Time))

CPSC 3120

Instructions

This assignment consists of 4 analytical problems and 2 programming problems. Your solutions to the analytical problems must be submitted, as one PDF **without spaces, tabs, parentheses, hyphens, 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 `cpsc3120homework03part01.h`, `cpsc3120homework03part02.h`, `cpsc3120homework03part01` and `cpsc3120homework03part02.cpp`, along with your PDF, via Canvas.

`maximumST`

`maximumST` is a function that should take an $n \times n$ vector (representing the adjacency matrix of a graph) as input and return the value of the maximum spanning tree of the graph defined by the $n \times n$ vector. For the purposes of this program, infinity (∞) will be represented as -1.

`allPairsSP`

`allPairsSP` is a function that should take an $n \times n$ vector (representing the adjacency matrix of a graph) and a value i between 1 and n as input and return the $n \times n$ vector representing the matrix computed after the i^{th} stage of Floyd's algorithm. For the purposes of this program, infinity (∞) will be represented as -1.

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-13.4 in *Algorithm Design and Applications*

Question 2 (10 points)
Question C-14.2 in *Algorithm Design and Applications*

Question 3 (10 points)
Question R-17.1 in *Algorithm Design and Applications*

Question 4 (10 points)
Question A-17.1 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%
`maximumST`	
Test Cases	1×20
Compilation	10
`maximumST` Total	30
`allPairsSP`	
Test Cases	1×20
Compilation	10
`allPairsSP` Total	30
Total	100%