CSCE 2211 Spring 2024 Applied Data Structures Assignment #6

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Date: Thu May 9, Due: Mon May 20, 2024

This is a Bonus (Optional) assignment. Its maximum grade will count as 2.5% of the total course grade.

No submissions will be accepted after the due date.

The problem: Finding All-Pairs shortest paths in a weighted graph

A network of highways connects N cities. Such network can be represented by a graph with N nodes and the weights on the edges represent the distances between pairs of cities. An Excel sheet **"Cities14.xlsx"** gives the adjacency matrix representation for such weighted graph for N = 14 cities. The graph is connected, and the weights are all positive integers in the range 20 - 100. Zero weights represent the absence of a highway, or the distance between a city and itself. The cities are simply named (A, B, C, ...).



Develop a program to:

- 1. Traverse the given graph using the *DFS* algorithm.
- 2. Determine the <u>All-Pairs shortest paths</u> in the given graph using **Floyed's** dynamic programming algorithm.

You should submit the following required documents:

- All C++ documentation.
- Output Results for the graph given in "Cities14.xlsx": The zip file "2211 Asn6 S24.rar" contains a test graph file "TestG.xlsx" representing a graph of 7 vertices, as well as the corresponding Excel file. You can test your implementation using this file. The sample output for that file is also given in file "Sample.txt" in the zip file.