Algorithm Analysis Homework 6

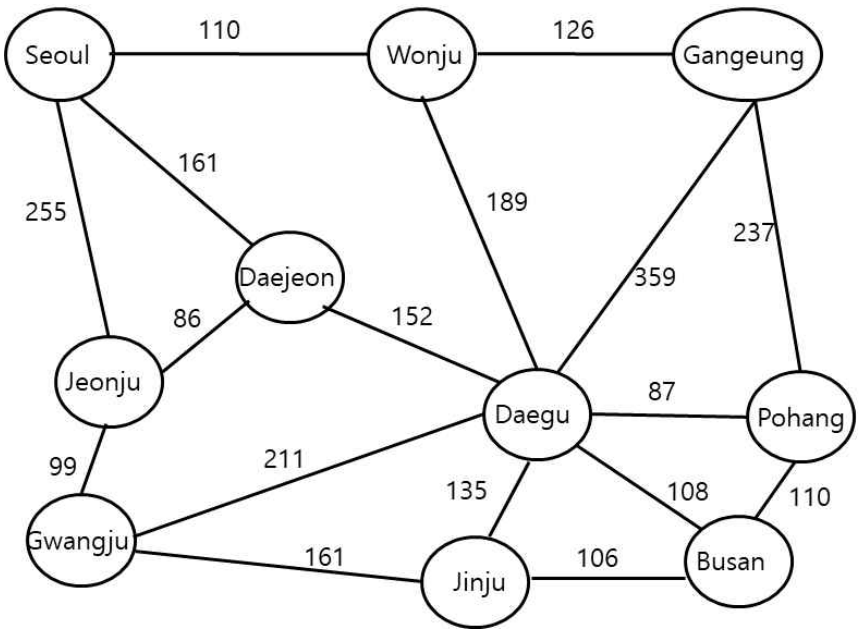
Due by 6/25(Tue.)

Write a C++ program for all pairs shortest path problem using the following algorithms.

a) Apply Dijkstra's algorithm |V| times on each vertex.

b) Apply Floyd's algorithm

Sample graph is as follows.



The input file name for the above graph is 'hw6.data'. The input file represents data in adjacency matrix format. (Assume there is one tab between the data.) We also assume that the number of vertices in the graph is 30 or less. If there is no direct route between two cities, the distance is displayed as 'INF'. The program outline is as follows:

Read input file
Create adjacency array/list for a given graph
Apply Dijkstra's algorithm for |V| times and print the results
Run Floyd's algorithm and print the results

Sample output)

The shortest distance between cities using Dijkstra's algorithm is:

	Busan	Daegu	Daejeon	Gang neung	Gwang ju	Jeonju	Jinju	Pohang	Seoul	Wonju
Busan	0	108	..	..	..	..	..	110	..	297
Daegu	108	0	..	..	..	..	..	..	..	..
Daejeon	..	..	0							
Gang neung	..	..	..	0	..	..	..	..	..	..
Gwang ju	..	..	..	..	0	..	..	..	..	..
Jeonju	..	..	..	..	..	0	..	..	..	..
Jinju	..	..	..	..	..	..	0	..	..	..
Pohang	110	..	..	..	..	..	..	0	..	..
Seoul	..	..	..	..	..	..	..	400	0	..
Wonju	297	..	..	..	..	..	..	..	..	..

(You have to fill out '..' part.)

The shortest distance between cities using Floyd's algorithm is:

/* a table with the same format as the table above. */

Test your program with graph with negative weight edge and with negative weight cycle, and check if your program works as you expected. (No extra points for this part, but you can see the difference between two algorithms.)

Note

1) Late submission of this homework is not permitted. If you submit your homework after due date, you will get no point.
2) Try to make your output as neat as possible, so that other person can see what you have done clearly.
2) Write program in C++. You may use any feature in C++ including STL.
3) If the program does not compile, you will get no point. Make sure that your program runs in g++.
4) Test your program with above example and several other graphs.
5) Do not use hyper scale AI, please.
6) At header part of comment, list all the references you used when you do this homework.
   For ex)
   (1) 강의 slide chapter 16.
   (2) Blog: ** URL here **
   (3) book: "Algorithm analysis in C++" by Someone