Algorithm Analysis Homework 7

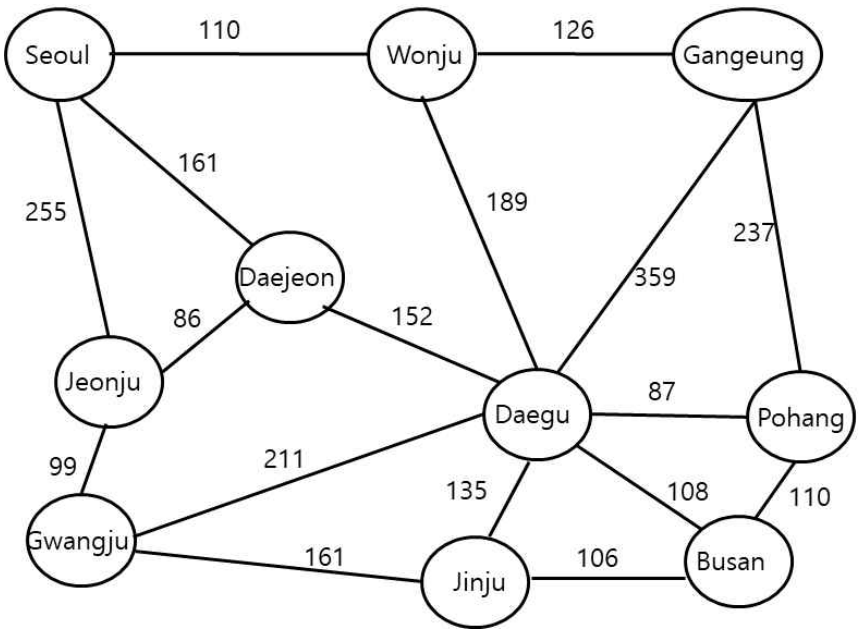
Due by 6/14(Sun.) through HISNET

You are to write a program for all pairs shortest path problem using following algorithms.

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

b) Apply Floyd's algorithm

Sample graph is as follows.



Input file for above graph is named as 'hw7.data' and available at hisnet. Input file represents data in adjacency matrix form as in hw6. (There are white spaces – such as tab or space – between data.) Assume number of nodes in your graph is less than or equal to 30. Program outline is as follows.

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

You should compute run time for each algorithm.

Sample output)

It took _____ seconds to compute shortest path between cities with Dijkstra's algorithm as follows.

	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	..	..	..	..	..	..	..	..	..

It took _____ seconds to compute shortest path between cities with Floyd algorithm as follows.

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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)