Homework lecture 6

Graphs – Advanced

1. Given *n* jobs (numbered from 1 to *n*) and *m* order requirements. Each order requirement is a pair of two jobs *u* and *v* indicating that job *u* must be done before job *v*. Your task is to write a program to order these jobs to fulfill the order requirements.

   Input: Data from file jobs.txt in the following format:

   - The first line contains two integer numbers *n* and *m*

   - *m* following lines each contains 2 integer numbers u,v indicating job *u* must be done before job *v*.

   Output: Data come to file jobs.out *n* ordered jobs that fulfill the order requirements.

   Example:

jobs.txt	jobs.out
8 10	2 1 7 3 8 6 5 4
2 3	
1 3	
1 8	
7 8	
7 4	
3 6	
3 5	
3 4	
8 5	
5 4	

2. Given a computer network of *n* computers (numbered from 1 to *n*). The cost to connect two computers *u* and *v* is D[*u,v*]>0. If computer *u* is connected with computer *b*, and computer *b* is connected with computer *c*, we say that computer *a* is connected with computer *c*. Your task is to find the minimum cost to connect computers such that all computers are connected.

Input: Data come from file "connection.txt" as described below:

- The first line contains two integer numbers *n, m*

- *m* following lines each contains 3 integer numbers *u, v, d* indicating that the cost to connect computer *u* and computer *v* is *d*.

Output: Results are written to file "connection.out" as described below:

- The first line contains the total cost.

- Following lines each contains three numbers *u, v, d* indicating that *u* and *v* are connected with the cost *d*.

Example:

connection.txt	connection.out
9 15	43
1 2 10	5 7 1
1 5 12	4 9 2
2 5 9	6 7 3
2 3 8	3 8 5
5 7 1	7 8 6
5 6 3	3 4 8
3 6 7	2 3 8
6 7 3	1 2 10
3 7 13	
3 4 8	
3 8 5	
7 8 6	
4 8 9	
4 9 2	
8 9 11	