Homework lecture 12

Graphs – Part 2

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 3 1 3 1 8 7 8 7 4 3 6 3 5 3 4 8 5 5 4	2 1 7 3 8 6 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 1 2 10 1 5 12 2 5 9 2 3 8 5 7 1 5 6 3 3 6 7 6 7 3 3 7 13 3 4 8 3 8 5 7 8 6 4 8 9 4 9 2 8 9 11	43 5 7 1 4 9 2 6 7 3 3 8 5 7 8 6 3 4 8 2 3 8 1 2 10