**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 |

1. 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 |