Maximum Flow

Problem ID: maxflow
CPU Time limit: 2 seconds
Memory limit: 1024 MB
Difficulty: 6.0

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Source: KTH CSC Popup 2005

Input

The first line of input contains a line with four non-negative integers, $2 \le n \le 500$, $0 \le m \le 10\,000$, $0 \le s \le n-1$ and $0 \le t \le n-1$, separated by single spaces, where n is the numbers of nodes in the graph, m is the number of edges, s is the source and t is the sink ($s \ne t$). Nodes are numbered from 0 to $n-1$. Then follow m lines, each line consisting of three (space-separated) integers u, v and c indicating that there is an edge from u to v in the graph with capacity $1 \le c \le 10^8$.

Output

The output should begin with a line containing three integers n, f, and m'. n is the number of nodes in the flow graph (same as in input), f is the size of a maximum flow from node s to node t in the flow graph, and m' is the number of edges used in the solution. You may assume that $f < 2^{31}$.

Then there should be m' lines, each containing three integers u, v and x, indicating that x units of flow are transported from u to v. x must be greater than 0 and at most as big as the capacity from u to v. Each pair of vertices (u, v) should be given at most once in the output.

Sample Input 1

```
4 5 0 3
0 1 10
1 2 1
1 3 1
0 2 1
2 3 10
```

Sample Output 1

```
4 3 5
0 1 2
0 2 1
1 2 1
1 3 1
2 3 2
```

Sample Input 2

```
2 1 0 1
0 1 100000
```

Sample Output 2

```
2 100000 1
0 1 100000
```

Sample Input 3

```
2 1 1 0
0 1 100000
```

Sample Output 3

```
2 0 0
```