Minimum Cut

Problem ID: mincut
CPU Time limit: 3 seconds
Memory limit: 1024 MB
Difficulty: 4.0

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Given a directed weighted graph and two vertices s, t, the goal is to find a subset U of the vertices such that $s \in U$, $t \notin U$, and the weight of edges from U to $\bar{U}$ is minimized.

Input

The first line of input contains four non-negative integers, $2 \leq n \leq 500$, $0 \leq m \leq 10\,000$, $0 \leq s \leq n-1$ and $0 \leq t \leq n-1$, 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 ($s \neq t$). Nodes are numbered from 0 to $n-1$. Then follow m lines, each line consisting of three (space-separated) integers u, v and w indicating that there is an edge from u to v in the graph with weight $1 \leq w \leq 10^8$.

Output

Output should begin with a line containing an integer k, giving the size of U. Then follow k lines giving the vertices in U, one per line. If there are multiple choices for U any one will be accepted.

You may assume that there is a cut such that the total weight of edges from U to $\bar{U}$ is less than 2^{31}.

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

```
2
1
0
```

Sample Input 2

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

Sample Output 2

```
1
0
```

Sample Input 3

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

Sample Output 3

```
1
1
```