IOITC 2020, Practice Test 1, 12 Jun 2020

Central Nodes

You are given an undirected, simple (no self-loops, no multi-edges) graph G which has edge weights. It is also connected: that is, you can reach every node from every other node. The graph has n nodes and m edges. The nodes are named $1, 2, \ldots, n$. Define $d_G(u, v)$ to be length of the shortest path from u to v in G. The length of a path is the sum of the weights of the edges in it.

A vertex c in G is said to be a Central Node, if deleting this node increases the shortest distance between some other two vertices. That is:

Let G' be the graph obtained by deleting c and its incident edges, from G. If there are some two vertices u and v, neither equal to c, such that $d_G(u, v) < d_{G'}(u, v)$, then c is said to be a Central Node.
We assume that the distane between two vertices which are not connected, to be infinity. Therefore, if a node disconnects some two vertices, then it is a Central Node.

Your task is to output all the Central Nodes in the graph.

Input

The first line contains two numbers: n and m, which denote the number of vertices and edges respectively.
Each of the next m lines contain three space separated integers u, v and w, which denotes that the edge (u, v) is in the graph, and its weight is w.

Output

The first line should contain one integer, k, which is the number of Central Nodes in G.
The next line should contain k space separated integers, which are the Central Nodes, sorted in increasing order.

Test Data

In all subtasks:

- $1 \leq m \leq \frac{n(n-1)}{2}$
- $1 \leq w \leq 10^9$, for all edges.

Subtask 1 (11 Points):

- $1 \leq n \leq 100$

Subtask 2 (33 Points):

- $1 \leq n \leq 500$

And it is guaranteed that the weights of all the edges are equal to 1.

Subtask 3 (56 Points):

- $1 \leq n \leq 500$

Sample Input1

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

Sample Output1

```
1
2
```

Limits

Time: 4 seconds

Memory: 256 MB