Algorithms Lab

Exercise 2 – *Algocoön Group*

Your idea for a startup established with your partner turned out to be a great success. On impulse, you jointly decided to spend a big chunk of your profits on one of those ancient Greek sculptures depicting a group of mythological figures entangled in a complicated configuration.

Unfortunately, you didn't give this idea enough thought. The problem is that both of you want to put the masterpiece in your living rooms, but you can afford only one sculpture. You already committed yourself to the transaction, but the auction house gave you some choice – you can choose one of the several sculptures they have in stock.

The only feasible solution at this point is to choose one of the artworks and hire a stonecutter to cut the piece in two parts so that each of you can take one part home. Fortunately none of you is a greedy person and you will be fine with any cut as long as each of you is going to get *something* to put in their room.

To minimize the cost of your whim, write a program that will process the descriptions of the sculptures and output the cost-optimal way of cutting each of them.

Input The first line of the input contains $1 \leq t \leq 100$, the number of sculptures. For each sculpture, its description starts with the line containing $2 \leq n \leq 100, 0 \leq m \leq 10^4$, where n is the number of the figures in the sculpture and m is the number of places where two of the figures are entangled and require work from the stonecutter.

m lines follow, each of them containing $a, b, c, 0 \leq a, b < n, 1 \leq c \leq 1000, a \neq b$, indicating that figures a and b are intertwined such that the stonecutter will charge c franks for separating the link. Note that a pair of figures can appear several times, being entangled in more than one place. Also note that the sculpture can even consist of several disconnected pieces. As usual, in each line consecutive numbers are separated with single spaces.

Output For each sculpture, output the way of cutting the links that will cost as little as possible and allow both you and your partner to take home a nonempty part of the sculpture.

In the first line, print the total cost of the optimal cut. In the second line, output the number of figures you are going to take home, followed by a single-space separated list of those figures. It is assumed that all the other figures will be taken by your associate. If there is more than one solution, output any of them.

Sample input

```
1
5 6
0 1 2
0 2 3
1 3 2
1 4 1
2 3 2
3 4 10
```

Sample output

```
4
2 0 2
```

Note that the output is not unique.