Skiing resort

Mouse Stofl is spending his spring holidays in Azerbaijan's skiing resort of Shahdaq in Caucasus mountains. The skiing resort consists of n junctions that are numbered from 0 to $n-1$. The junctions are connected by k cablecars and m ski slopes. The cablecars transport people uphill between junctions and the skiers can ski slopes between junctions downhill.

Stofl would like to start in a junction p and take one or more cablecars to reach a junction q. From junction q he would like to ski downhill on one or more slopes to the junction p. For each cablecar and ski slope Stofl has measured the time it takes to ride it. If Stofl rides multiple slopes/cablecars in a row the total time is the sum of times of the riding times of individual slopes/cablecars.

Of course Stofl wants to ski as much as possible and he wants to spend as little time as possible in cablecars. In order to do so he wants to find a pair of junctions p and q such that:

- Stofl starts in the junction p and rides one or more cablecars by which he reaches junction q in time t_c minutes.
- Stofl starts in the junction q and rides one or more slopes by which he reaches junction p in time t_s minutes.
- The ratio of the skiing time between q and p and the time spent in cablecars traveling between p and q is maximal.
- It is guaranteed that the optimal pair of junctions is unique if it exists.

Input

The first line of the input consists of the integers n, k and m ($2 \leq n \leq 2000$).

Each of the following k lines describes a cablecar and consists of three integers a, b, c – the cablecar brings skiers from a junction a to a junction b in time c minutes. ($0 \leq a, b < n$, $1 \leq c \leq 5 \cdot 10^5$)

Each of the following m lines describes a ski slope and consists of three integers a, b, c – the ski slope starts in a junction a and ends in a junction b and it takes c minutes to ride it. ($0 \leq a, b, < n$, $1 \leq c \leq 5 \cdot 10^5$)

A slope will always end at a strictly lower junction than it started and a cablecar will always end at a strictly higher junction than it started. There might be multiple cablecars and/or slopes between the same pair of junctions.

Output

For each test case output either a single line with the word "`None`" (without quotes) if no solution exists, or output four integers p, q, t_c and t_s as described above.

Limits

There are four batches of input, each worth 25 points:

1. $2 \leq n \leq 100, 1 \leq k, m \leq 100$
2. $2 \leq n \leq 500, 1 \leq k, m \leq 500$
3. $2 \leq n \leq 1000, 1 \leq k, m \leq 2000$
4. $2 \leq n \leq 2000, 1 \leq k, m \leq 4000$

Examples

Input	Output
4 3 2 3 1 12 0 2 3 1 0 15 2 1 2 0 3 8	3 0 27 8

Input	Output
4 2 3 3 1 3 2 1 6 2 0 1 2 3 5 1 0 9	None