

Police Investigation 5 (police5)


The police is still searching fearsome William! Given the skills of the criminal, who is apparently able to drive his car and find his way through the M roads of the city, the police has placed bombs in some of those roads to stop and eventually catch him. A button pressed at time T will trigger the simultaneous explosion of all the bombs, effectively making some roads unusable.



Figure 1: William driving: apparently is very calm in a deserted city.

Labelling the N intersections with integers, William is now at the intersection 0 and wants to reach his nest at the intersection $N - 1$. Thanks to his network of fellow criminals, he has come into possession of the plan of the police, knowing for each road from intersection A_i to B_i whether it will explode or not.

William knows how many seconds it will cost him to drive through each road, but obviously cannot drive on roads that are already exploded or will explode while driving on them. Is he going to be able to reach his nest and get away with it? If so, how many seconds is it going to take?

 Among the attachments of this task you may find a template file `police5.*` with a sample incomplete implementation.

Input

The first line contains three integers: N , M and T . Each of the following M lines describes a road with four integers: the start A_i , the destination B_i , the cost C_i in seconds to drive through it, and whether it will explode ($E_i = 1$) or not ($E_i = 0$).

Output







You need to write a single line with an integer: the time in seconds required for William to reach his nest, or -1 if he cannot make it.

Constraints

- $2 \leq N \leq 10\,000$.
- $1 \leq M \leq 100\,000$.
- $1 \leq T \leq 10\,000\,000$.
- $0 \leq A_i, B_i < N$ for each $i = 0 \dots N - 1$.
- $1 \leq C_i \leq 100$ for each $i = 0 \dots N - 1$.
- $E_i = 0$ or $E_i = 1$ for each $i = 0 \dots N - 1$.
- Each road has a directionality and William can only drive from A_i to B_i .
- It is possible to drive on a road that will explode exactly at the moment in which William will reach its end.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

- **Subtask 1** (0 points) Examples.

- **Subtask 2** (10 points) There are just $N - 1$ roads that form a “path” from 0 to $N - 1$, i.e. from 0 to 1, from 1 to 2, ..., and from $N - 2$ to $N - 1$.

- **Subtask 3** (20 points) $C_i = 1$ for each $i = 0 \dots N - 1$.

- **Subtask 4** (20 points) $T = 10\,000\,000$.

- **Subtask 5** (30 points) $N \leq 100$.

- **Subtask 6** (20 points) No additional limitations.


Examples

input	output
4 4 100 0 1 10 1 1 3 50 1 0 2 20 1 2 3 60 1	60
4 4 20 0 1 10 0 1 3 50 1 0 2 20 1 2 3 60 0	80

Explanation

In the **first sample case** William can reach his destination driving through intersection 0, 1 and 3 taking $10 + 50 = 60$ seconds. All the roads contain bombs and will explode at $T = 100$, but by that time William will be already safe.

In the **second sample case** William cannot drive again from 1 to 2 because at time $T = 20$ that road will explode, and he will be in the middle of that (10 seconds after having left intersection 1). He can use the alternative path 0, 2, and 3. The road from 0 to 2 will explode too, but exactly at the moment at which William will not be driving on it anymore.