



Task: DRO

The way home

XXVIII OI, Stage III, Day One. Source file dro. * Available memory: 512 MB. 04/14/2021

Byteburg's road network consists of n junctions connected by two-way roads. Each road connects two different intersections. Each two intersections are connected by at most one road. Roads can lead through tunnels and flyovers.

At the intersection number 1 there is Bajtek's school, and at the intersection number n there is his house. In the morning his parents drive him to school, but he returns home alone, using public transport. The bus timetable has changed again this year. As in Byteburg are only single tickets validated at each bus entry, Bajtek decided to develop the fastest return home plan, with at most k changes. Help him!

Each bus of a given line follows a predetermined route, passing certain intersections. At each of these intersections, it stops and can be entered or exited. Buses of the given line depart at regular intervals (details are described in the *Entry section*).

We assume that the time:

- stop at intersections, • change from bus to bus (if you do not have to wait for it), • transition from school to intersection number 1 and transition from intersection number n to home

it is negligibly small.

Entry

The first line of input contains five integers n, m, s, k and t ($2 \leq n \leq 10,000, 1 \leq m \leq 50,000, 1 \leq s \leq 25,000, 0 \leq k \leq 100, 0 \leq t \leq 109$) denoting in turn: the number of intersections, roads and bus lines in Byteburg, the maximum number of changes that Bajtek can make and the minute in which he leaves school. We number the intersections from 1 to n .

The following m lines contain descriptions of roads; each of them contains three integers a, b and c ($1 \leq a, b \leq n, a \neq b, 1 \leq c \leq 109$) denoting that the intersections numbered a and b are connected by a two-way road which must be passed (any bus that travels along this road) takes c minutes. Each unordered pair $\{a, b\}$ will appear on the input at most once.

The next $2s$ lines contain descriptions of bus lines; each description in two lines. The first line of the description contains three integers \tilde{y}, x and y ($2 \leq \tilde{y} \leq n, 0 \leq x \leq 109, 1 \leq y \leq 109$) and the second line contains $2\tilde{y}$ integers $v_1, v_2, \dots, v_{2\tilde{y}}$, and then goes successively through the intersections numbered $v_1, v_2, \dots, v_{2\tilde{y}}$, in minutes $x + j \cdot y$ for $j = 0, 1, \dots, \tilde{y} - 1$.

The sum of the numbers \tilde{y} for all bus lines does not exceed 50,000.

Exit

Your program should output one line with an integer representing the earliest minute that Bytie can reach home, if he left school in minute t . If Bytie does not manage to get home at all, write only one word instead NOT.

Example

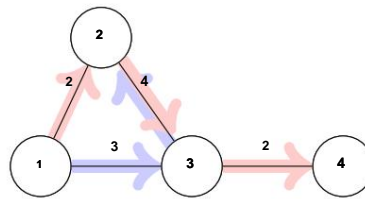
For the input data:

```
4 4 2 1 1
1 2 2
2 3 4
1 3 3
4 3 2
4 0 10
1 2 3 4 3
2 7 1 3 2
```

the correct result is:

```
8
```

Explanation of the example: The figure below shows the Byteburg road network from the example test. Colic represent intersections, the numbers inside the circles are their numbers. The lines indicate the roads, and the numbers written next to them indicate the travel time of the road. The route of the line 1 bus is marked in red, while the route of the bus number 2 - blue.



Bajtek leaves school in minute $t = 1$, waits for bus line 2, which arrives in minute 2, goes before crossing number 3, there you change in minute 6 to bus line 1, which comes to his house in the 8th minute.

For $k = 0$, Bytie would have to wait at the intersection 1 for the bus line 1, which would set off in minute 10 and took Bajtek home in minute 18.

"Assessment" Tests:

1st estimate: $n = 10$, $m = 45$, $k = 10$, $t = 123$; intersections with numbers that differ by 1 are connected by roads with a length of 1, and the remaining pairs of intersections are connected by roads with a length of 100; the buses start run from minute 0, they transport between each pair of intersections with numbers differing by 1 or 2 and they run every minute; the answer is 132;

2ocen: $n = 103$, $m = 102$, $k = 100$, $t = 0$; intersections with numbers that differ by 1 are connected by roads of length 1 and the remaining pairs of intersections are not directly connected; there is one bus, which starts running at minute 109 and goes through the intersections $(1, 2, 3, \dots, n)$, and there are buses that they start running at minute 0 and transport between each pair of intersections with different numbers at 1 and finish the course; the answer is $109 + 102$;

3ocen: $n = 10,000$, $m = 17,891$, $s = 7891$, $k = 50$, $t = 0$; the answer is 11 100,000 071.

Assessment

The test suite is divided into the following subtasks. The tests for each subtask consist of one or more separate test groups.

Subtask	Conditions	number of points
1	$k = n$	20
2	for each bus line: $v_i < v_i + 1$ for each bus line: \bar{y}	20
3	$= 2$ $t = 0$ and for each bus line: $x = 0$, $y = 1$ with	20
4	no additional conditions	20
5		20