Fine Trip

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

There are n crossings in Bytetown, connected with m bidirectional roads. The i-th road connects crossings u_i and v_i, has length of l_i meters and a *cost factor* of c_i.

In order to ease the road traffic, a special fine system is used in Bytetown. You can drive with any speed and change the speed whenever you want. However, if the maximum speed during your travel along the road i is v meters per second, you should pay $v \cdot c_i$ dollars fine.

You live near the crossing 1 and want to get to the crossing n in no more than T seconds. What is the smallest possible fine you will have to pay if you choose the route and the speed for each road optimally?

Input

In the first line of the input there are three numbers n, m and T ($1 \le n \le 2000$, $1 \le m \le 100\,000$, $1 \le T \le 10^9$).

The i-th of the next m lines contains four numbers u_i, v_i, l_i, c_i, describing the i-th edge according to the statement ($1 \le u_i, v_i \le n$, $u_i \ne v_i$, $1 \le l_i, c_i \le 10^9$).

It is guaranteed that it is possible to reach the crossing n starting at the crossing 1.

Output

Print single real number — the smallest possible fine. Your answer will be considered correct if its relative or absolute error doesn't exceed 10^{-6}.

Examples

standard input	standard output
3 3 100 1 3 100 100 1 2 100 24 2 3 100 24	96.0000000000
3 2 10 1 2 9 1 2 3 1 1000	119.8736659610
4 5 9 1 2 6 7 1 3 6 2 2 3 8 7 2 4 3 4 3 4 1 7	4.1478114200