UTS Open '15 #4 - Subway

Time limit: 1.0s **Memory limit:** 256M

Ms. Evans is meeting some venture capitalists who may be able to fund her startup. Unfortunately, she is running late, and the meeting is in T $(1 \le T \le 2000)$ minutes. The subway system is a network of N stations $(2 \le N \le 2000)$ numbered from 1 to N which are connected to each other by M one-way links $(1 \le M \le 2000)$. The i^{th} link connects station a_i to station b_i $(1 \le a_i, b_i \le N, a_i \ne b_i)$ and could take anywhere from x_i to y_i minutes to traverse $(1 \le x_i \le y_i \le 10^5)$. The time taken is an integer number of minutes chosen uniformly at random from all integers between x_i and y_i inclusive.

The subway system is very unpredictable.

Since the system is complicated, Ms. Evans follows a simple procedure: at every point, she uses a link selected uniformly at random from all links leaving her current station. Ms. Evans ends her trip when she reaches the meeting or reaches a station without any outgoing links.

Ms. Evans starts at station 1 and the meeting will be held in station N. Ms. Evans arrived at the meeting after X minutes, and she was on time (that is, $X \le T$). Calculate the expected value of X.

Portion of marks	Constraints on N	Constraints on M	Constraints on T
20%	$N = 2$	$M \le 2000$	$T \le 2000$
50%	$N \le 100$	$M \le 100$	$T \le 100$
30%	$N \le 2000$	$M \le 2000$	$T \le 2000$

Input Specification

The first line will contain N, M, and T. The i^{th} of the next M lines will contain a_i, b_i, x_i, and y_i in sequence. It is guaranteed that the chance of Ms. Evans arriving on time will exceed 10^{-11}.

Output Specification

A single line containing the answer to the problem. Your answer will be considered correct if its absolute or relative error does not exceed 10^{-6}.

Sample Input 1

```
2 1 4
1 2 1 100000
```

Sample Output 1

```
2.5000000000
```

Explanation for Sample Output 1

In this case, the answer is the average of the values that would let Ms. Evans be on time: $\frac{1+2+3+4}{4} = \frac{5}{2}$.

Sample Input 2

```
3 2 3
1 2 1 100000
2 3 1 100000
```

Sample Output 2

```
2.6666666667
```

Sample Input 3

```
3 3 2000
1 3 1 1
1 2 1 1
2 1 1 1
```

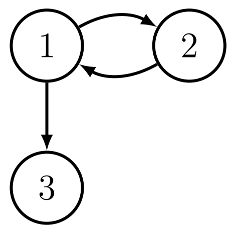
Sample Output 3

```
3.0000000000
```

Explanation for Sample Output 3

The answer is close to $(1)\left(\frac{1}{2}\right) + (3)\left(\frac{1}{4}\right) + \cdots + (1999)\left(\frac{1}{2^{1000}}\right) \approx 3$.

Picture for Sample Input 3



Sample Input 4

```
2 3 10
1 2 6 10
1 2 1 2015
1 2 8 17
```

Sample Output 4

```
8.2203841034
```

Sample Input 5

```
3 4 3
1 2 1 2
2 3 2 2
2 3 1 6
1 3 1 10
```

Sample Output 5

```
2.4938271605
```

Picture for Sample Input 5