Commuting

Daylight savings time just started, and you forgot to change your clock! Since your alarm didn't go off, you're running late for work. While you're brushing your teeth, you're thinking about the best way to get there.

The city is a collection of N intersections (numbered from 1 to N) connected by M one-way roads, which vary in speed limit and length. Your house is located at intersection 1, and your workplace is at intersection N. Given descriptions of all the roads, can you figure out how long it will take you to get to work if you take the optimal route and don't speed? Round your answer to the nearest hour.

Grading

Correctness & Efficiency: 80%

- Passes 50 test cases: 80%
- Passes 30 to 49 test cases: 60%
- Passes 10 to 39 test cases: 40%
- Passes 1 to 9 test cases: 20%
- Passes 0 test cases: 0%

Code Quality: 20%

Input Format

Each test case begins with two space-separated integers, N and M. The next M lines describe the roads, each containing 4 integers: U (the intersection where the road starts), V (the intersection where the road ends), S (the speed limit on the road, in mph), and L (the length of the road, in miles).

Constraints

$1 \leq N \leq 15,000$

$1 \leq M \leq 15,000$

$1 \leq U, V \leq N$

$1 \leq S \leq 60$

$1 \leq L \leq 100$

It is guaranteed that there exists a path from intersection 1 to intersection N.

Output Format

Print a single integer: the number of hours it will take you to get to work, rounded to the nearest hour. Do not print a decimal point.

Sample Input 0

```
4 5
1 2 10 10
2 3 5 10
1 3 2 10
3 4 60 60
1 2 5 10
```

Sample Output 0

```
4
```

Explanation 0

We can get from intersection 1 to intersection 2 in 1 hour, then from 2 to 3 in another 2 hours, then from 3 to 4 in another hour, for a total of 4 hours.

Note that in some test cases the shortest path may not be integer length, and you need to round it to the nearest integer.

Note also that there can be multiple roads connecting the same pair of intersections, with different lengths and speed limits.