2024 Convoy

A convoy of vehicles has lined up on a single lane and one-way street in front of a single lane and one-way bridge over a river. Note that since the street is single lane, no vehicle can overtake any other. The bridge can sustain a given maximum load. To control the traffic on the bridge, operators are stationed on either end of the bridge. The convoy of vehicles is to be divided into groups, such that all the vehicles in any group can cross the bridge together. When a group reaches the other side, the operator on that side of the bridge uses a telephone to inform the operator on this side that the next group can start its journey over the bridge. The weight of each vehicle is known. The sum of the weights of the vehicles in any group cannot exceed the maximum load sustainable by the bridge. Associated with each vehicle is the maximum speed with which it can travel over the bridge. The time taken by a group of vehicles is calculated as the time taken by the slowest vehicle in the group to cross the bridge. The problem is to find the minimum amount of time in which the entire convoy can cross the bridge.

Input

Input consists on several test cases.

For each case, the first line of input contains three positive integers (separated by blanks): the first one represents the maximum load that the bridge can sustain (in tonnes); the second one represents the length of the bridge (in kms); and the third one is the number of vehicles (n) in the convoy.

Each of the next n lines of input contains a pair of positive integers, w s (separated by blanks), where w is the weight of the vehicle (in tonnes) and s is the maximum speed (in kmph) with which this vehicle can travel over the bridge. The weights and speeds of the vehicles are specified in the same order as the order in which the vehicles are queued up. You can assume that $n < 1000$.

Output

The output of each dataset should be a single real number on a line by itself, specifying the minimum time in minutes in which the convoy can cross the bridge.

Print the number with exactly one decimal digit.

Sample Input

```
100 5 10
40 25
50 20
50 20
70 10
12 50
9 70
49 30
38 25
27 50
19 70
```

Sample Output

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75.0
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