

Problem K: K.O. Kids II

Time limit: 1.5 seconds

It's Glen's birthday again and this year everybody is invited to take part in a parkour game. The game works as follows: The n kids queue up and do the parkour one-after-the-other. The parkour consists of k obstacles, which have to be beaten in order $1, 2, \dots, k$. Obstacle i is overcome with probability a_i and failed with probability $1 - a_i$. In case a participant fails at an obstacle his or her run is over. There is one twist: once one participant manages to beat a certain obstacle, all the other participants see how it's done and will *always* beat this obstacle as well.

As it is his birthday, Glen can freely choose his position in the queue. Compute the maximum probability for him being the *first* to beat the parkour when he chooses the initial position in the queue optimally.

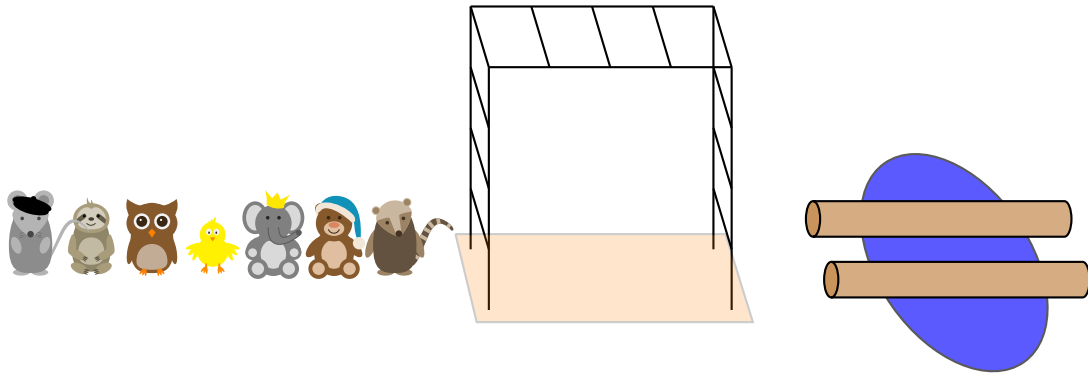


Figure K.1: Glen and his friends queueing up for the obstacle parkour course.

Input

The input consists of:

- One line with two integers n and k ($1 \leq n \leq 10^3, 1 \leq k \leq 10^4$), the number of kids and obstacles.
- One line with k real numbers a_1, \dots, a_k ($0 < a_i < 1$ for all i), where a_i is the probability that obstacle i is overcome. Every real number has at most six digits after the decimal point.

Output

Print the maximum probability for Glen to be the first to beat the parkour. Your answer should have an absolute or relative error of at most 10^{-6} .

Sample Input 1

```
3 3
0.5 0.5 0.5
```

Sample Output 1

```
0.1875000000
```

Sample Input 2

```
2 1
0.1
```

Sample Output 2

```
0.1000000000
```

Sample Input 3

```
3 3
0.5 0.4 0.3
```

Sample Output 3

```
0.1302000000
```