



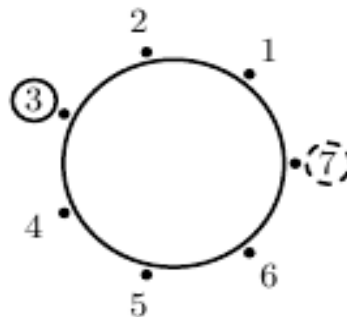
## 4049 - Game

**Europe - Northeastern Europe - 2007/2008**

A group of contestants sits at the round table and plays the following game to relieve anxiety before the start of NEERC 2007. The game is played with a single token that is given to one person at the beginning of the game. This person passes the token to the adjacent person on the left-hand side or to the adjacent person on the right-hand side with a certain probability. A person who receives the token does the same with his own probability and so on. The game ends when each person has received the token at least once. The last person who has received the token wins.

The problem is to find the probability of winning for the given person. The probability of passing the token to the left or to the right is individual for each person and is known in advance before the beginning of the game.

Contestants are numbered from 1 to  $n$  so that the person number 2 sits to the right of 1, the person number 3 sits to the right of 2, and so on. The person number 1 sits to the right of  $n$ . The game starts with the person whose number is specified in the input file and your task is to find the probability of winning for the person number  $n$ .



Picture shows 7 contestants at the table with the token given to the person number 3.

### Input

Input consists of several datasets. The first line of each dataset contains two integer numbers  $n$  and  $k$  ( $2 \leq n \leq 50$ ,  $1 \leq k < n$ ).  $n$  denotes the total number of contestants,  $k$  denotes the number of the person who has the token at the beginning of the game.

The second line of the input file contains  $n - 1$  numbers that denote the probabilities  $p_i$  ( $0.01 \leq p_i \leq 0.99$ ) of passing the token to the right for the persons numbered from 1 to  $n - 1$ . The probability of passing the token to the left for the person number  $i$  is  $1 - p_i$ . The probabilities are given with at most 2 digits after decimal point.

### Output

For each dataset, write to the output file a single number that denotes the probability of winning for the person number  $n$  with a precision of at least 6 digits after decimal point.

Note: all probabilities in the third example are on the same line in the actual input file.

## Sample Input

```
7 3
0.5 0.5 0.5 0.5 0.5 0.5

3 1
0.3 0.6

24 12
0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.99 0.5
0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01 0.01
```

## Sample Output

```
0.1666666667
0.3000000000
0.9800000000
```

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