Planet Cake **P12956_en**

Setè Concurs de Programacio de la UPC - Semifinal (2009-06-29)

In the planet Cake, home of the Master Masao, a casino offers a particular game. There is an array of probabilities $p_1, \ldots, p_{2m+1}$ for some natural number m. At every moment, a coin has probability p_i of landing heads when flipped. If it indeed lands heads, the next time the probability will be p_{i+1}. Otherwise, the probability will be p_{i-1}. The initial "state" is $m+1$. Before playing, you must decide a number k between 1 and $m+1$. Afterwards, you flip the coin k times. You win if the total number of times the coin landed heads is an odd number.

Given the probabilities of a coin, compute the probability of winning a game assuming an optimal strategy.

Input

Input consists of several cases, each with an odd number n followed by n probabilities. Assume $n < 50$.

Output

For every case, print the probability of winning with four digits after the decimal point. The input cases have no precision issues.

Sample input

```
1   0.7
3   1 1 0
3   0.5 0.5 0.5
11  0.4 0.5 0.6 0.7 0.8
    0.9 1 0 0.1 0.2 0.3
3   0.8 0.6 0.3
```

Sample output

```
0.7000
1.0000
0.5000
0.9914
0.7400
```

Problem information

Author : Xavier Martínez
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