Problem Statement

An airline is selling tickets for one of its flights. The ticket can be purchased during **N** consecutive days. On each day the price of the ticket is a constant, but it may change between days.

You are given the **N** and the **C** that describes how the prices change between days. Suppose the price on day 1 is P_1. Between day 1 and day 2 the price will change by **C**[0] percent, between day 2 and day 3 it will change by **C**[1] percent, and so on. Formally, if P_i denotes the price on day i, we have that for each i > 1 the price P_i is computed as P_{i-1} * (100 + **C**[i-2]) / 100.

Of course, since we are talking about real money, all prices are immediately rounded to two decimal places (i.e., cents). The usual rounding "to the nearest cent" is applied, with half a cent always being rounded up. Thus, X.424999 is rounded to X.42, while X.425 becomes X.43. Note that the rounding is applied after computing each price. For example, the price P_3 is computed from the rounded value of the price P_2.

The company wants to estimate the amount of money they will get for one ticket. For simplicity, they made the assumption that the ticket will sell on one of the **N** days, chosen uniformly at random. Thus, the expected price it will be sold for is (P_1 + P_2 + ... + P_N) / **N**. Note that the calculated expected price is also rounded to cents.

Let's take a look at the following example. The airline is selling a ticket for 5 days with the changes in price between days being -10%, +15%, +5%, -20%. If the airline sets the initial price P_1 to 200 euro, then the prices in each of the 5 days will be (200.00, 180.00, 207.00, 217.35, 173.88). The expected selling price will then be (200.00 + 180.00 + 207.00 + 217.35 + 173.88) / 5 = 195.65 euro. (Note that the actual expected price is 195.646, but it is also rounded to cents.)

In order to be profitable, the airline wants the expected price of the ticket to be **target** euro. (That is, exactly **target**.00 euro after the last rounding.) Now they wonder what initial price P_1 they should set in order to achieve this goal. In the example above, if **target** is 180 euro, then the initial price P_1 must be 184.01 euro. This way the price of the ticket in each of the days would be (184.01, 165.61, 190.45, 199.97, 159.98), whose average is 180.004 which rounds to the desired 180.00.

Elly recently started working at the airline. Now her task is to determine the initial price of the ticket P_1 given **N**, **C**, and **target**. Return a floating point number rounded to exactly two decimal places - the initial price P_1, that the company must use.

Definition

Class:

EllysTicketPrices

Method:

getPrice

Parameters:

int, vector <int>, int

Returns:

double

Method signature:

double getPrice(int N, vector <int> C, int target)
(be sure your method is public)

Limits

Time limit (s):

2.000
Memory limit (MB):

256

Notes

- Even though the return value is exact, due to the way floating point numbers work return values with an absolute or a relative error up to 10^(-9) will be accepted.

Constraints

- **N** will be between 2 and 100, inclusive.
- **C** will contain exactly **N** - 1 elements.
- Each element of **C** will be between -99 and +99, inclusive.
- **target** will be between 10 and 10,000, inclusive.
- It is guaranteed that the input will be such that there will exist a *unique* price P_1 which gives the expected selling price **target**.

Examples

0)
5
{-10, 15, 5, -20}
180
Returns: 184.01
The example from the problem statement.
1)
11
{5, 16, 17, -3, -10, 20, 20, 14, 2, 0}
1337
Returns: 874.77
2)
2
{0}
42
Returns: 42.0
With no change in the price, the answer should be obvious.
3)
20
{30, -26, 87, 47, -39, 25, -67, 62, -38, 68, -84, 5, 28, -20, 50, -61, 10, 63, -71}

```
392
Returns: 476.28
4)
50
{-60, 61, 17, 86, 56, 27, 9, 41, -27, -36, 57, -16, 1, 50, -55, -36, 14, 13, -93, 14, 18, 25, 62, -18, 40, 79, 56, 19,
10, -55, -43, 45, -43, -84, 61, -64, 41, -55, 38, 18, 36, -43, 79, 33, 87, 19, -47, 38, -56}
8887
Returns: 9451.93
```