Bubble Cup V9 H Dexterina's Lab

Dexterina and **Womandark** have been arch-rivals since they've known each other. Since both are super-intelligent teenage girls, they've always been trying to solve their disputes in a peaceful and nonviolent way. After god knows how many different challenges they've given to one another, their score is equal and they're both desperately trying to best the other in various games of wits. This time, Dexterina challenged Womandark to a game of **Nim**.

Nim is a two-player game in which players take turns removing objects from **distinct** heaps. On each turn, a player must remove **at least one object**, and may remove **any number** of objects from a single heap. The player to remove the **last** object wins.

By their agreement, the sizes of piles are selected randomly from the range $[0, X]$ Each pile's size is taken from the same probability distribution.

Womandark is coming up with a brand new and evil idea on how to thwart Dexterina's plans, so she hasn't got much spare time. She, however, offered you some tips on looking fabulous in exchange for helping her win in Nim. Your task is to tell her what is the **probability** that the **first** player to play wins, given the rules as above and assuming that both players play optimally.

Input Specification

The first line of input contains 2 integers: N and X. The second line contains $X + 1$ real numbers, given to 6 decimal places each: $P(0), \cdots, P(X)$.

Output Specification

Output a single real number, the probability that the first player wins. The answer will be judged as correct if it differs from the correct answer by at most 10^{-6}.

Constraints

- $1 \leq N \leq 10^9$
- $1 \leq X \leq 100$

Example Input

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2 2
0.5 0.25 0.25
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Example Output

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0.625
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Explanation

The correct answer is exactly 0.625. The checker will also accept, for example, outputs like 0.625000, 0.625001 and 0.625000000.