Problem J. Jinx or Jackpot

Time limit: 3 seconds
Memory limit: 1024 megabytes

Jack is in his favourite casino and has 1000 dollars. The casino has literally nothing but a single slot machine. Jack knows the history of this casino. Once upon a time, the future owner of the casino was walking and suddenly saw an array of n integer **choices** $p_1, \ldots, p_n$ each from 0 to 100. He picked an index i ($1 \le i \le n$) uniformly at random and thought that it was a good idea to create a casino in which there is only one slot machine with jackpot probability of $\frac{p_i}{100}$. And he created it.

Jack knows the array of choices $p_1, \ldots, p_n$ that suddenly appeared to the owner during the walk, but he does not know which i the owner picked. However, the chosen index i is fixed forever; the slot machine always uses the same p_i as explained below.

On the slot machine, Jack can bet x dollars, where x is a **non-negative** integer, and pull the lever. Then:

1. With probability $\frac{p_i}{100}$ it will be a jackpot, and the slot machine returns $2x$ dollars to him, so he gains x dollars.
2. With probability $1 - \frac{p_i}{100}$ it will be a jinx, and the slot machine returns nothing to him, so he loses x dollars.

Even if Jack bets 0 dollars, he will understand whether it was a jinx or a jackpot.

Also, the slot machine is not very durable, so Jack can play at most k rounds on it.

Find the maximum expected *profit* Jack can achieve by an optimal strategy. Here a profit is defined as the final amount of money Jack has minus his initial 1000 dollars.

Of course, Jack can't make a bet that is more than his current balance.

Input

The first line contains two integers n and k ($1 \le n \le 100\,000$; $1 \le k \le 30$) — the number of choices and the limit on the number of rounds. The second line contains n integers $p_1, \ldots, p_n$ ($0 \le p_i \le 100$) — the choices.

Output

Output a single real number — the expected profit Jack can achieve by an optimal strategy. Your answer will be considered correct if its absolute or relative error is at most 10^{-4}.

Examples

standard input	standard output
2 2 70 30	160
2 30 30 70	12099716.1778528057038784
2 5 40 50	0
6 6 10 20 60 30 40 50	29.40799999999990177457221
1 5 61	1702.708163199999489734182