Ethanol

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Little Cyan Fish is playing with some bottles. On his table, there are $n+2$ sufficiently large containers numbered $0, 1, \ldots, n+1$.

Initially, container 0 contains water of mass $\frac{X}{1000}$, and container $n+1$ is empty. For each $i = 1, \ldots, n$, container i contains a uniform mixture of total mass 1, containing $\frac{E_i}{1000}$ ethanol and $1 - \frac{E_i}{1000}$ water.

Little Cyan Fish may repeat the following operation any (finite) number of times (possibly zero):

1. Choose an index i ($0 \le i \le n$) and a real number $x > 0$ such that, if $i \ge 1$, container i currently contains a mixture of mass at least $1 + x$ (however, for $i = 0$, we require the condition with $1 + x$ replaced by x).
2. Transfer a mixture of mass x from container i to container $i + 1$, then stir the contents of container $i + 1$ so that the resulting mixture becomes uniform.

Yeah... I know you are sick of seeing yet another constructive problem. Therefore, Little Cyan Fish proposes this gift for you. He asks you to find the supremum (the least upper bound not necessarily attainable) of the mass of ethanol that may end up in container $n + 1$ after performing a finite sequence of operations. Does this sound good to you?

Input

There are multiple test cases in a single test file. The first line of the input contains an integer T ($1 \le T \le 1\,000$), indicating the number of test cases. For each test case:

The first line of the input contains two integers n and X ($1 \le n \le 20$, $1 \le X \le 1\,000$).

The next line of the input contains n integers $E_1, E_2, \ldots, E_n$ ($0 \le E_i \le 1\,000$).

Output

For each test case, print a single line containing a single real number, indicating the supremum of the ethanol mass in container $n + 1$ after operations.

Your answer is acceptable if its absolute or relative error does not exceed 10^{-9}. Formally speaking, suppose that your output is x and the jury's answer is y, and your output is accepted if and only if $\frac{|x-y|}{\max(1,|y|)} \le 10^{-9}$.

Examples

standard input	standard output
2 1 900 1000 2 345 678 910	0.59343034025940088812 0.29768625581348055032
1 3 210 406 364 961	0.18956125995075295122

Note

For example, for the first test case, you can make the mass of ethanol that ends up in container 2 equal to $\frac{23}{45}$ by performing the following operations.

1. Transfer a mixture of mass 0.5 from container 0 to container 1.
2. Transfer a mixture of mass 0.4 from container 1 to container 2.
3. Transfer a mixture of mass 0.4 from container 0 to container 1.
4. Transfer a mixture of mass 0.5 from container 1 to container 2.

In fact, you can achieve approximately 0.593... by performing operations properly.