clipsing Star

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

I am Ningguang, Tianquan of Qixing. You wish to trade? You be my personal bodyguard, and I will show you how to get ahead in Liyue.

—Ningguang

As Tianquan of the Liyue Qixing, Ningguang holds a position of wealth beyond many others in Teyvat, and represents fortune and wit.

Today, you're launching a challenge to Ningguang. The rules are as follows:

- There will be n rounds. In the i-th round, there will be a_i Mora.
- In the first round, you are the offensive player and Ningguang is the defensive player.
- In the i-th round, the offensive player can choose a integer b_i ($b_i \in [0, a_i]$), then, the offensive player will get b_i Mora and the defensive player will get $a_i - b_i$ Mora.
- After that, there is $\frac{b_i}{a_i}$ probability that two players exchange positions — the offensive player becomes defensive player and the defensive player becomes offensive player.

In this challenge, both you and Ningguang are clever enough to take the best strategy to get more Mora. Define x as the expectation of Mora you get, and y as the expectation of Mora Ningguang gets. Now, you want to calculate the maximum value of $x - y$.

Your answer will be considered correct, if its absolute or relative error does not exceed 10^{-4}. More formally, if your answer is a and jury's answer is b, your answer will be considered correct if $\frac{|a-b|}{\max(1,b)} \leq 10^{-4}$.

Input

The first line contains a single integer n ($1 \leq n \leq 10^6$), which means there will be n round in this challenge.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \leq a_i \leq 10^9$), which means there will be a_i Mora in the i-th round.

Output

Output a single real number — the maximum value of $x - y$.

Examples

standard input	standard output
2 10 5	5.0000000000
3 10 5 20	5.0000000000
6 1 1 4 5 1 4	0.0000000000

Note

The first example is explained as following:

- In the first round, you can get all of 10 Mora directly and left nothing.
- Then, in the second round, although there is 100% probability for Ningguang to become the offensive player, she can only get 5 Mora as most.
- So, you get 10 Mora totally, Ningguang gets 5 Mora totally. The answer is $x - y = 10 - 5 = 5$.

It's not difficult to prove that it's impossible to make answer greater than 5 in the first example.

> *Ningguang is a professional businesswoman, having accumulated her wealth through hard work and perseverance, with the Jade Chamber being the pinnacle of her work. While maintaining law and order in Liyue as the Tianquan, Ningguang always looks for good opportunities with her business wit. Despite her wealth, she dislikes excess extravagance and uses her accumulated mora wisely.*