Problem E. Random Dungeon

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	1024 megabytes

Mike is playing a video game called Random Dungeon.

In this game, you will challenge a dungeon and get rewards based on your score every week.

Mike has discovered that the dungeon has N variations, numbered from 1 to N. Mike will challenge the dungeon N times, and for each challenge, the game chooses a variation that has not appeared in previous challenges with equal probability.

Mike will get a score of A_i challenging the dungeon variation i. He can choose to stop whenever he has completed a challenge, and his final score will be the score of the last challenge. At the end of the week, if his final score is x, he will be rewarded x coins. However, challenging the dungeon costs coins. Each challenge costs C coins.

If Mike acts to maximize the expected profit (coins earned at the end of the week minus coins spent on challenge), find the expected profit.

Input

The first line contains two integers N and C ($1 \le N \le 2 \cdot 10^5$, $1 \le C \le 10^9$).

The second line contains N integers $A_1, A_2, \ldots, A_N$ ($1 \le A_i \le 10^9$) — the score of Mike challenging dungeon variation i.

Output

Output the expected profit. Your answer will be considered correct if the absolute error or the relative error does not exceed 10^{-9}. That is, if the correct answer is x, and your answer is y, your answer will be considered correct if $\frac{|x-y|}{\max\{1,|x|\}} \le 10^{-9}$.

Examples

standard input	standard output
3 1 1 2 3	1.1666666667
3 3 1 2 3	-1.0000000000
9 193138187 782710197 539624191 631858791 976609486 752268030 30225807 279200011 467188665 630132600	442999078.5373015873

Note

In the first example, the best strategy of Mike is: If the dungeon in the first challenge is variation 2 or 3, stop; otherwise, do a second challenge and stop. The expected profit is $\frac{1}{3} \cdot (2-1) + \frac{1}{3} \cdot (3-1) + \frac{1}{3} \cdot \left(\frac{2+3}{2} - 2\right) = \frac{7}{6}$.

In the second example, the best strategy of Mike is: do a single challenge and stop.

The third example contains extra line breaks to fit into the table.