

# 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  $C$  ( $1 \leq N \leq 2 \cdot 10^5$ ,  $1 \leq C \leq 10^9$ ).

The second line contains  $N$  integers  $A_1, A_2, \dots, A_N$  ( $1 \leq A_i \leq 10^9$ ) — 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  $\frac{|x-y|}{\max\{1, |x|\}} \leq 10^{-9}$ .

## 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.