



Problem C: Random Ants

Time limit: 1s; Memory limit: 250 MB

A kid is observing n ants crawling on a string on the ground. Each ant randomly crawls along one of two directions, to the tail or the head of the string with the velocity of 1mm/s. The kid realized a very interesting thing: the ants are very kind, so when two ants met each other on the string, both of them will immediately turn around (i.e they will change their directions) and continue crawling. Given the initial position of the ants, which is determined by the distance from each ant to the head of the string and the length of the string (in mm), find the expected time the last ant(s) will leave the string.

Input

The first line of the input contains 2 positive integers N, L ($1 \leq N \leq 10^6, 1 \leq L \leq 10^9$) – the number of groups and the number of parts.

The next line contains N integer numbers a_i ($1 \leq a_i < L$) – the initial distances from the head of the string to each ant. All a_i are pairwise different.

Output

Print one number, the expected time the last ant(s) will leave the string in seconds. The output will be accepted if it has absolute error or relative error at most 10^{-6} .

Examples

Input	Output
1 5 2	2.5
2 5 2 3	2.75
3 7 1 2 5	5.125



Explanation

In the first sample, if the ant crawls toward the head, it will take 2s. And if it crawls toward the tail, it will take 3s.

In the second sample, there are 4 possibilities. One of them is: the first ant crawl toward the tail and the second crawls toward to head, after 0.5s, they will meet each other at 2.5mm from the head and then turn around. So they will take 2.5 s more to leave, and total time is 3s.