

Problem C. Calculating Average

Input file: *standard input*
Output file: *standard output*
Time limit: 5 seconds
Memory limit: 512 mebibytes

Bytelandian schools have a rather unusual average mark calculation system. Students' marks are represented as an array a of n integers. At the end of a term, the teacher picks any mark with index k in array a . Then the student may choose any consecutive segment of marks that contains the k -th mark (that is, the one chosen by the teacher). The final mark is the average value of marks on this segment.

You study in a Bytelandian school and want to find out which mark you can obtain. Since you don't know the index the teacher will choose, you need to calculate the highest possible average mark for each possible index k . Formally, for each k you need to find the maximum possible average value of a subsegment that contains the k -th element of the array a .

Input

The first line contains a single integer n ($1 \leq n \leq 2 \cdot 10^5$), the amount of marks.

The second line contains n integers a_i ($0 \leq a_i \leq 10^9$) separated by spaces: the array of your marks.

Output

Print n lines. In the i -th line, print the maximum possible average mark if the teacher chose index i . The answer is considered correct if its absolute or relative error does not exceed 10^{-6} .

Example

standard input	standard output
6	4.500000
2 4 5 7 3 6	5.333333
	6.000000
	7.000000
	5.333333
	6.000000

Note

For $k = 1$, you can choose the entire array, and the answer will be $\frac{2+4+5+7+3+6}{6} = 4.5$.

For $k = 2$, you can choose the second, the third and the fourth marks, and the answer will be $\frac{4+5+7}{3} = 5\frac{1}{3}$.

For $k = 3$, you can choose the third and the fourth marks, and the answer will be $\frac{5+7}{2} = 6$.

For $k = 4$, you can choose the fourth mark and get the answer 7.

For $k = 5$, you can choose the last three marks and get the answer $\frac{7+3+6}{3} = 5\frac{1}{3}$.

For $k = 6$, you can choose the last mark and get the answer 6.

It can be shown that these answers are optimal.