

Problem E. Embedding the Polygon

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 512 mebibytes

Given n integers — lengths of the segments. Your task is to embed the polygon with n vertices and with edges equal to those integers into the circle of the minimal radius (i.e. such as all the vertices are placed on the circumference).

Input

First line of the input contains one integer n that indicates the number of edges ($3 \leq n \leq 1000$). x_k ($k = 1, \dots, n$) is an integer that indicates the length of the k -th edge ($1 \leq x_k \leq 6000$).

You may assume the existence of one or more polygons with the specified edge lengths. You can prove that one of such polygons has a circumscribed circle.

Output

Output the minimum radius of a circumscribed circle of a polygon with the specified edge lengths. Absolute/relative error of the output should be within 10^{-7} .

Examples

standard input	standard output
5 3 1 6 1 7	3.54440435
3 500 300 400	250.0
6 2000 3000 4000 2000 3000 4000	3037.33679126
10 602 67 67 67 67 67 67 67 67 67	3003.13981697
3 6000 6000 1	3000.00001042