Problem E
Jewelry Size
Time Limit: 3 seconds

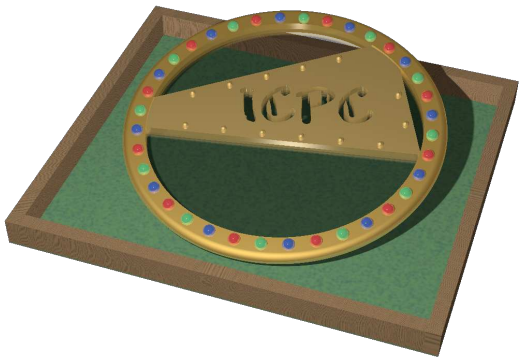
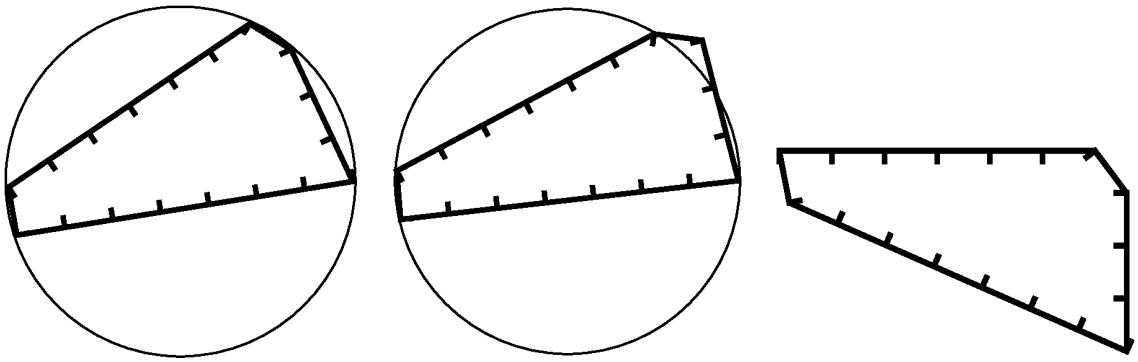


Figure E.1. Jewelry

She came up with a new jewelry design. The design uses two parts: a hollow circlet and a convex polygonal component. The design can be customized by specifying the edge lengths of the polygon, which should be multiples of a unit length, so that customers can embed memorial numbers in the jewelry. Note that there can be many different polygons with edges of the specified lengths. Among them, one with a circumscribed circle, that is, a circle that passes through all of its vertices, is chosen so that the polygonal component can be firmly anchored to the circlet



(a) (b) (c)

Figure E.2. (a) A pentagon with a circumscribed circle; (b) A pentagon with no circumscribed circle; (c) Another pentagon with no circumscribed circle

For example, Figure E.2(a) has a pentagon with its edge lengths of 3, 1, 6, 1, and 7 units, meaning March 16th and 17th. The radius of the circle is approximately 3.544 units. Figures E.2(b) and E.2(c) show pentagons with the same edge lengths but neither of them has a circumscribed circle.

To commercialize the jewelry, she needs to be able to compute the radius of the circumscribed circle from specified edge lengths. Can you help her by writing a program for this task?

Input

The input consists of a single test case of the following format.

n
$x_1 \ldots x_n$

n is an integer that indicates the number of edges ($3 \leq n \leq 1000$). x_k ($k = 1, \ldots, n$) 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}.

Sample Input 1

```
5
3 1 6 1 7
```

Sample Output 1

```
3.54440435
```

Sample Input 2

```
3
500 300 400
```

Sample Output 2

```
250.0
```

Sample Input 3

```
6
2000 3000 4000 2000 3000 4000
```

Sample Output 3

```
3037.33679126
```

Sample Input 4

```
10
602 67 67 67 67 67 67 67 67 67
```

Sample Output 4

```
3003.13981697
```

Sample Input 5	Sample Output 5
3 6000 6000 1	3000.00001042