

## 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

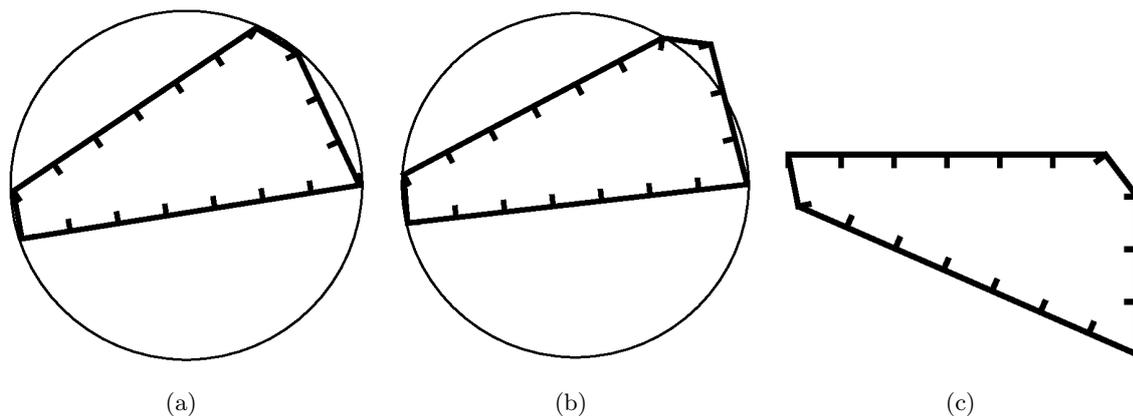


Figure E.2. (a) A pentagon with a circumscribed circle; (b) A pentagon with no circumscribed circle; (c) Another pentagon with no circumscribed circle

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.

$$n$$

$$x_1 \dots x_n$$

$n$  is an integer 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  $10^{-7}$ .

### 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
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