Huy Dang

TEST
Programming Aptitude Test

TEST ENDS
2018-09-01 03:05:40 UTC

REMAINING
1 day, 23:59:47

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Instructions

Problem A

The trick to boiling vegetables is to make sure all pieces are about the same size. If they are not, the small ones get too soft or the large ones get undercooked (or both). Fortunately, you have heard of the kitchen knife, but your parents' warnings of using sharp instruments still echoes in your head. Therefore you better use it as little as possible. You can take a piece of a vegetable of weight w and cut it arbitrarily in two pieces of weight w_{left} and w_{right}, where $w_{\text{left}} + w_{\text{right}} = w$. This operation constitutes a "cut". Given a set of pieces of vegetables, determine the minimum number of cuts needed to make the ratio between the smallest and the largest resulting piece go above a given threshold.

Photo by Martin Cathrae

Input

The input starts with a floating point number T with 2 decimal digits, $0.5 < T < 1$, and a positive integer $N \leq 1\,000$. Next follow N positive integer weights $w_1, w_2, \ldots, w_N$. All weights are less than 10^6.

Output

Output the minimum number of cuts needed to make the ratio between the resulting minimum weight piece and the resulting maximum weight piece be above T. You may assume that the number of cuts needed is less than 500.

To avoid issues with floating point numbers, you can assume that the optimal answer for ratio T is the same as for ratio $T + 0.0001$.

Sample Input 1

```
0.99 3
2000 3000 4000
```

Sample Output 1

```
6
```

Sample Input 2

```
0.80 2
1000 1400
```

Sample Output 2

```
3
```

Submit

Problem ID: bbd0059784a3c442

CPU Time limit: 1 second

Memory limit: 1024 MB

Difficulty: medium

Download:
Sample data files

Author(s): Andreas Björklund and Lukáš Poláček

Source: Nordic Collegiate Programming Contest 2013