

Baltic OI '05 P6 - Polygon

Time limit: 2.0s **Memory limit:** 512M

Write a program to find a convex polygon whose sides have the given lengths.

In this task, we consider a polygon to be convex if all its inner angles are strictly greater than 0 degrees and strictly less than 180 degrees.

Input Specification

The first line of the file contains an integer N , the number of vertices of the polygon ($3 \leq N \leq 1000$). Each of the following N lines contains an integer a_i , the length of one side of the polygon ($1 \leq a_i \leq 10\,000$).

Output Specification

If the desired polygon can be constructed, the output should contain exactly N lines. Each line should contain two real numbers x_i and y_i ($|x_i| \leq 10\,000\,000$, $|y_i| \leq 10\,000\,000$) such that by connecting the points (x_i, y_i) and (x_{i+1}, y_{i+1}) for all $1 \leq i < N$ and additionally the points (x_N, y_N) and (x_1, y_1) with line segments, we obtain a convex polygon. The lengths of the line segments must be equal to the numbers given in the input file, but not necessarily in the same order.

The vertices of the constructed polygon can be listed either clockwise or counterclockwise.

If the polygon cannot be constructed, print `NO SOLUTION` on the single line of the output file.

Sample Input

```
4
7
4
5
4
```

Sample Output

```
0.5 2.5
7.5 2.5
4.5 6.5
0.5 6.5
```

Grading

The grading program considers two lengths equal if they differ by less than 0.001. Any standard floating point format is acceptable.