Problem B. Deadly Sin

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	512 mebibytes

You have to find n real numbers x_i with the following property:

For every sequence $s_1, \ldots, s_n$ *(*$s_i \in \{-1, 1\}$*) there exists a real number* a *such that* $s_i \cdot \sin(a \cdot \pi \cdot x_i) > 0$ *for each* $1 \le i \le n$.

After finding these numbers, you will also have to convince us that the property holds. To do this, you will have to provide the value of a for some sequences s_i.

Input

The first line of input contains an integer n ($1 \le n \le 100$).

The next lines contain the queries — one query per line. Each query consists of n integers $s_i \in \{-1, 1\}$ separated by spaces.

The input is terminated with a single zero on a new line. There will be no more than 100 queries.

Output

On the first line of the output, write n real numbers x_i.

For each query in the input, write a single real number a such that the property from the problem statement holds.

All the numbers must be printed in fixed point format. Each number must contain no more than 500 digits (in total, before and after the decimal point).

You may assume that your answers will be verified with no error at all.

Example

standard input	standard output
3 -1 -1 -1 1 -1 -1 1 1 -1 1 1 1 0	1.0 2.0 3.0 1.72 0.53 0.36 2.24