4908 Wedges

This problem deals with the "wedge" product of two n-dimensional vectors.

An n-dimensional vector can be interpreted as the weighted sum of n unitvectors $e_1 \dots e_n$; the weights are the components of the n-dimensional vector. For example, if $n = 3$:

$(1, 2, 3)$ is interpreted as $1e_1 + 2e_2 + 3e_3$

Multiplication is expected to be associative and distributive over addition. Therefore, the *wedge product* of two n-dimensional vectors, expressed with $\wedge$ as an operator, is defined by interpreting the vectors as sums of unit vectors, distributing the wedge product over addition, and ordering the unit vectors in the result. For example:

$(1, 2, 3) \wedge (4, 5, 6)$ is defined as

$$\begin{aligned} & (1e_1 + 2e_2 + 3e_3) \wedge (4e_1 + 5\ e_2 + 6e_3) \\ = \quad & 4e_1 \wedge e_1 + 5e_1 \wedge e_2 + 6e_1 \wedge e_3 \\ + \quad & 8e_2 \wedge e_1 + 10e_2 \wedge e_2 + 12e_2 \wedge e_3 \\ + \quad & 12e_3 \wedge e_1 + 15e_3 \wedge e_2 + 18e_3 \wedge e_3 \end{aligned}$$

The *wedge product* of two unit vectors can be interpreted as a signed area, therefore the following identities hold:

$e_1 \wedge e_1, e_2 \wedge e_2 \dots$	are all zero because there is no area between one and the same vector.
$e_i \wedge e_j = -e_j \wedge e_i$	because an area is oriented.

Using these identities it is possible to simplify the product given above:

$$\begin{aligned} = \quad & & & 5e_1 \wedge e_2 & + & 6e_1 \wedge e_3 \\ + \quad & 8e_2 \wedge e_1 & & & + & 12e_2 \wedge e_3 \\ + \quad & 12e_3 \wedge e_1 & + & 15e_3 \wedge e_2 & & \\ = \quad & 5e_1 \wedge e_2 & + & 6e_1 \wedge e_3 & & \\ - \quad & 8e_1 \wedge e_2 & & & + & 12e_2 \wedge e_3 \\ - \quad & & & -12e_1 \wedge e_3 & - & 15e_2 \wedge e_3 \\ = \quad & -3e_1 \wedge e_2 & - & 6e_1 \wedge e_3 & - & 3e_2 \wedge e_3 \end{aligned}$$

The value of a wedge product of two n-dimensional vectors can be interpreted as a vector with components over wedge products of unit vectors $e_i \wedge e_j$, ordered by i and then by j as shown above. Here the component vector is $(-3, -6, -3)$.

Write a program implementing the wedge product of two n-dimensional vectors.

Input

The input file contains several test cases, each of them as described below.

The first line contains a positive integer n, the dimension of the two vectors ($n \leq 100$).

Each of the next two lines contains n integers, the components of one vector, separated by white space (each component is $\leq 10,000$).

Output

For each test case, the output is a single line with integers separated by white space: the components of $e_i \wedge e_j$ with $i \neq j$ in order.

Sampe Input

```
2
1 2
3 4
3
1 2 3
4 5 6
```

Sample Output

```
-2
-3 -6 -3
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