Sum

Once upon a time, there existed a sequence A consisting of N positive integers. You don't know the

sequence itself, but you do know the sum of every two elements of the sequence. Find the sequence A!

Input

The first line of input contains the positive integer N ($2 \leq N \leq 1000$). Each of the following N lines

contains N positive integers smaller than or equal to 100000, forming the table S. The following relations

hold: $S(i, j) = A[i] + A[j]$ for $i \neq j$, and $S(i, j) = 0$ for $i = j$. Here $S(i, j)$ denotes the number in the

i^{th} row and j^{th} column of the table, and $A[i]$ denotes the ith element of the sequence A. It is guaranteed

that for any input data set there exists a unique sequence of positive integers A with the given properties.

Output

The first and only line of output must contain the required sequence A (in the form of N space separated

positive integers).

Example

Input:
2
0 2
2 0

Output:
1 1

Input:
4
0 3 6 7
3 0 5 6
6 5 0 9
7 6 9 0

Output:
2 1 4 5