PrefMexSuf

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	512 megabytes

Natural numbers are positive integers. Define mex as non-empty set of natural numbers A as the minimum natural number which is not in the set A. For example, $mex(\{3,4\}) = 1$, $mex(\{1,4\}) = 2$, $mex(\{1,2,3,6,7\}) = 4$.

Alisa has an array with N natural numbers and she told Boban mex of all prefix and suffix arrays of her array($2 \cdot N$ values in total). Boban wants to guess the original array which Alisa has, and you need to help Boban with that.

It's guaranteed there is at least one solution for given numbers, and there can be multiple ones. If there are multiple solutions, you can write any of them, but all elements of the array must be natural numbers less or equal to 10^9.

Input

- The first line of input contains one integer N, the length of Alisa's array ($3 \leq N \leq 10^5$).

- The second line of input contains array P of N numbers, which are mex values of prefix arrays ($1 \leq P[i] \leq 10^9$, for $1 \leq i \leq N$), i-th number is mex of a set of the first i elements of Alisas's array.

- The third line of input contains array S of N numbers, which are mex values of suffix arrays ($1 \leq S[i] \leq 10^9$, for $1 \leq i \leq N$), i-th number is mex of a set of the last $N-i+1$ elements of Alisas's array.

Output

In the single line write N numbers, one possible solution for Alisa's array.

Example

standard input	standard output
3 1 3 4 4 2 1	2 1 3