Problem D. Christmas Children Circle

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

There are n children numbered $1, 2, \ldots, n$. They stand in a circle. Each child has a bag with non-empty set of distinct positive integers.

As a part of Christmas celebration, children want to play a game of the following rules:

1. Each child has to take exactly one integer from her bag.
2. Each child passes her integer to the next one, so child 1 passes her number to child 2, child 2 passes her number to child 3, and so one, child n passes her number to child 1.
3. Each child puts her newly acquired number back in her bag.
4. The procedure described above should be performed exactly once. Children win if after they are done with passing integers, each bag contains only distinct integers, i.e. no bag contains the same integer twice.

Help children win the game or find out that this is impossible.

Input

The first line of the input contains a single integer n ($2 \le n \le 500\,000$), the number of children.

The i-th of the following n lines contains the description of the i-th child' bag. The first integer of each description is k_i ($1 \le k_i$) — the number of integers in the bag. Then follow k_i integers a_{ij} ($1 \le a_{ij} \le 10^9$), which describe the content of the bag.

The total size of all bags is constrained as $\sum k_i \le 500\,000$.

It is guaranteed that all integers in each particular bag are distinct.

Output

If there is no way for children to win the game, print `-1` in the only line of the output. Otherwise, print n integers, $x_1, x_2, \ldots, x_n$, where x_i is the integer that the i-th child must pull out of her bag and pass to the next child in order to succeed in the game.

Example

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