Problem C
Changing Seats

The *International Collegiate Programming Contest* (ICPC) is a competition where people take part **in teams**. The competition not only challenges participants' algorithmic skill and problem-solving skill, but also requires coordination and solidarity among team members.

Today, besides the main event, ICPC participants also have opportunities to participate in a mini game. As there are a total of $2 \cdot n - 1$ participants, the organizer prepared $2 \cdot n$ chairs, and aligns them into two rows of chairs, with n chairs each. The two rows face each other, and chairs on each row are numbered from 1 to n from left to right. So the i-th chair on the first row is opposite to the i-th chair on the second row. Participants are numbered from 1 to $2 \cdot n - 1$, inclusive.

Initially, each person chooses a chair to sit. $2 \cdot n - 1$ people occupy $2 \cdot n - 1$ different chairs, hence there is exactly one empty chair. Then game goes as follows: In each turn, everyone elects a person who is sitting on the row without the empty chair. The elected person then moves to the empty chair.

The goal of the game is that, after at most $686\,868$ turns, the following conditions must be satisfied:

- The person who initially sits on the i-th chair of the first row now sits on the i-th chair of the second row.
- The person who initially sits on the i-th chair of the second row now sits on the i-th chair of the first row.

Even though this is a simple game, it is still very challenging. In order to win this game, everyone must corporate with the others. As a team member, you want to contribute as well! Given the initial configuration, please find a way for everyone to win the game, or find out if it is impossible to achieve the goal of the game.

Input

The first line contains a single integer n $(1 \leq n \leq 10^5)$ – the number of chairs on each row.

The i-th line of the next two lines contains n integers $a_{i,1}, a_{i,2}, \ldots, a_{i,n}$ $(0 \leq a_{i,j} < 2 \cdot n)$ representing the initial configuration of the game:

- if $a_{i,j} > 0$, $a_{i,j}$ will be the index of the participant that sits on the j-th chair of the i-th row.
- otherwise, the j-th chair of the i-th row is empty.

It is guaranteed that the values of a are pair-wise distinct.

Output

If there is no way to win the game, print a single integer -1.

Otherwise, on the first line, print one integer m ($0 \le m \le 686\,868$) – the number of required turns.

On the next line, print m integers $b_1, b_2, \ldots, b_m$ ($1 \le b_i < 2 \cdot n$), where b_i is the index of the participant who will move to the empty chair in the i-th turn.

If there are multiple solutions, you can output any of them.

Sample Input 1	Sample Output 1
1 1 0	1 1

Sample Input 2	Sample Output 2
3 2 0 1 3 5 4	11 3 2 5 3 4 5 3 4 5 1 4