

Limited Swaps

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

Lina is playing with n cubes placed in a row. Each cube has an integer from 1 to n written on it. Every integer from 1 to n appears on exactly one cube.

Initially, the numbers on the cubes from left to right are a_1, a_2, \dots, a_n . Lina wants the numbers on the cubes from left to right to be b_1, b_2, \dots, b_n .

Lina can swap any two adjacent cubes, but only if the difference between the numbers on them is at least 2. This operation can be performed at most 20 000 times.

Find any sequence of swaps that transforms the initial configuration of numbers on the cubes into the desired one, or report that it is impossible.

Input

The first line contains a single integer n — the number of cubes ($1 \leq n \leq 100$).

The second line contains n distinct integers a_1, a_2, \dots, a_n — the initial numbers on the cubes from left to right ($1 \leq a_i \leq n$).

The third line contains n distinct integers b_1, b_2, \dots, b_n — the desired numbers on the cubes from left to right ($1 \leq b_i \leq n$).

Output

If it is impossible to obtain the desired configuration of numbers on the cubes from the initial one, print a single integer -1 .

Otherwise, in the first line, print a single integer k — the number of swaps in your sequence ($0 \leq k \leq 20\,000$).

In the second line, print k integers s_1, s_2, \dots, s_k describing the operations in order ($1 \leq s_i \leq n - 1$). Integer s_i stands for “swap the s_i -th cube from the left with the $(s_i + 1)$ -th cube from the left”.

You do not have to find the shortest solution. Any solution satisfying the constraints will be accepted.

Examples

standard input	standard output
5 1 3 5 2 4 3 5 1 4 2	3 1 2 4
4 1 2 3 4 4 3 2 1	-1

Note

In the first example test, the configuration of numbers changes as follows:

$$1 \ 3 \ 5 \ 2 \ 4 \rightarrow \underline{1} \ 5 \ 3 \ 2 \ 4 \rightarrow 5 \ \underline{1} \ 3 \ 2 \ 4 \rightarrow 5 \ 3 \ 1 \ \underline{2} \ 4 \rightarrow \underline{5} \ 3 \ 1 \ 4 \ 2 \rightarrow 3 \ 5 \ 1 \ 4 \ 2$$

In the second example test, making even a single swap in the initial configuration is impossible.