CodeForces Problem

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F. Double Sort II

Constriants

Time Limit 2 seconds **Memory Limit** 512 MB

Problem Statement

You are given two permutations a and b, both of size n. A permutation of size n is an array of n elements, where each integer from 1 to n appears exactly once. The elements in each permutation are indexed from 1 to n.

You can perform the following operation any number of times: choose an integer i from 1 to n; let x be the integer such that $a_x = i$. Swap a_i with a_x; let y be the integer such that $b_y = i$. Swap b_i with b_y.

Your goal is to make both permutations sorted in ascending order (i. e. the conditions $a_1 <; a_2 <; \ldots <; a_n$ and $b_1 <; b_2 <; \ldots <; b_n$ must be satisfied) using minimum number of operations. Note that both permutations must be sorted after you perform the sequence of operations you have chosen.

Input Description

The first line contains one integer n ($2 \le n \le 3000$).

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le n$; all a_i are distinct).

The third line contains n integers $b_1, b_2, \ldots, b_n$ ($1 \le b_i \le n$; all b_i are distinct).

Output Description :

First, print one integer k ($0 \le k \le 2n$) — the minimum number of operations required to sort both permutations. Note that it can be shown that $2n$ operations are always enough.

Then, print k integers $op_1, op_2, \ldots, op_k$ ($1 \le op_j \le n$), where op_j is the value of i you choose during the j-th operation.

If there are multiple answers, print any of them.

Examples

Input

```
5
1 3 2 4 5
2 1 3 4 5
```

Output

```
1
2
```

Input

```
2
1 2
1 2
```

Output

```
0
```

Input

```
4
1 3 4 2
4 3 2 1
```

Output

```
2
3 4
```