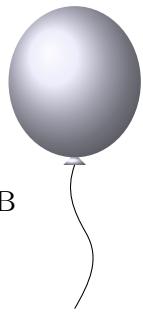


# E Permutation Inversions

TIME LIMIT: 4.0s  
MEMORY LIMIT: 1024MB



Consider permutations of  $n$  integers from 1 to  $n$ .

For a permutation  $a$ , the *number of inversions*  $\text{inv}(a)$  is the number of pairs of indices  $(i, j)$  such that  $i < j$  and  $a_i > a_j$ .

The *composition*  $a(b)$  of permutations  $a$  and  $b$  is the permutation  $b_{a_1}, b_{a_2}, \dots, b_{a_n}$ .

You are given two permutations of  $n$  integers:  $p$  and  $q$ . Find a permutation  $r$  such that the value  $\max(\text{inv}(p(r)), \text{inv}(q(r)))$  is the minimum possible.

## INPUT

The first line contains a single integer  $n$  ( $1 \leq n \leq 5 \cdot 10^5$ ).

The second line contains  $n$  integers  $p_1, p_2, \dots, p_n$  ( $1 \leq p_i \leq n$ ,  $p_i \neq p_j$  for  $i \neq j$ ).

The third line contains  $n$  integers  $q_1, q_2, \dots, q_n$  ( $1 \leq q_i \leq n$ ,  $q_i \neq q_j$  for  $i \neq j$ ).

## OUTPUT

The first line should contain the minimum possible value of  $\max(\text{inv}(p(r)), \text{inv}(q(r)))$ .

The second line should contain  $n$  integers: the elements of permutation  $r$ . If there are several possible solutions, print any one of them.

## SAMPLES

Sample input 1	Sample output 1
3 1 2 3 3 1 2	1 1 3 2