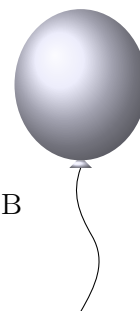


E Permutation Inversions

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