

7334 Kernel Knights

Jousting is a medieval contest that involves people on horseback trying to strike each other with wooden lances while riding at high speed. A total of $2n$ knights have entered a jousting tournament — n knights from each of the two great rival houses. Upon arrival, each knight has challenged a single knight from the other house to a duel.

A *kernel* is defined as some subset S of knights with the following two properties:

- No knight in S was challenged by another knight in S .
- Every knight not in S was challenged by some knight in S .

Given the set of the challenges issued, find one kernel. It is guaranteed that a kernel always exists.

Input

The input file contains several test cases, each of them as described below.

The first line contains an integer n ($1 \leq n \leq 100000$) — the number of knights of each house. The knights from the first house are denoted with integers 1 through n , knights from the second house with integers $n + 1$ through $2n$.

The following line contains integers f_1, f_2, \dots, f_n — the k -th integer f_k is the index of the knight challenged by knight k ($n + 1 \leq f_k \leq 2n$).

The following line contains integers s_1, s_2, \dots, s_n — the k -th integer s_k is the index of the knight challenged by knight $n + k$ ($1 \leq s_k \leq n$).

Output

For each case, output the indices of the knights in the kernel on a single line. If there is more than one solution, you may output any one.

Sample Input

```
4
5 6 7 7
1 3 2 3
```

Sample Output

```
1 2 4 8
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