Problem I. Vasya and Books

Time limit 1000 ms
Mem limit 262144 kB

Vasya has got n books, numbered from 1 to n, arranged in a stack. The topmost book has number a_1, the next one — a_2, and so on. The book at the bottom of the stack has number a_n. **All numbers are distinct**.

Vasya wants to move all the books to his backpack in n steps. During i-th step he wants to move the book number b_i into his backpack. If the book with number b_i is in the stack, he takes this book and all the books **above** the book b_i, and puts them into the backpack; otherwise he does nothing and begins the next step. For example, if books are arranged in the order $[1, 2, 3]$ (book 1 is the topmost), and Vasya moves the books in the order $[2, 1, 3]$, then during the first step he will move two books (1 and 2), during the second step he will do nothing (since book 1 is already in the backpack), and during the third step — one book (the book number 3). **Note that $b_1, b_2, \ldots, b_n$ are distinct.**

Help Vasya! Tell him the number of books he will put into his backpack during each step.

Input

The first line contains one integer n $(1 \le n \le 2 \cdot 10^5)$ — the number of books in the stack.

The second line contains n integers $a_1, a_2, \ldots, a_n$ $(1 \le a_i \le n)$ denoting the stack of books.

The third line contains n integers $b_1, b_2, \ldots, b_n$ $(1 \le b_i \le n)$ denoting the steps Vasya is going to perform.

All numbers $a_1 \ldots a_n$ are distinct, the same goes for $b_1 \ldots b_n$.

Output

Print n integers. The i-th of them should be equal to the number of books Vasya moves to his backpack during the i-th step.

Sample 1

Input	Output
3 1 2 3 2 1 3	2 0 1

Sample 2

Input	Output
5 3 1 4 2 5 4 5 1 3 2	3 2 0 0 0

Sample 3

Input	Output
6 6 5 4 3 2 1 6 5 3 4 2 1	1 1 2 0 1 1

Note

The first example is described in the statement.

In the second example, during the first step Vasya will move the books $[3, 1, 4]$. After that only books 2 and 5 remain in the stack (2 is above 5). During the second step Vasya will take the books 2 and 5. After that the stack becomes empty, so during next steps Vasya won't move any books.