Problem B

For a permutation $\pi : \{1, \ldots, n\} \to \{1, \ldots, n\}$, a *$\pi$-rearrangement* of a string $S = s_1 s_2 \ldots s_n$ is the string whose i-th character is $s_{\pi(i)}$.

You are given two permutations π_1 and π_2 of $\{1, \ldots, n\}$. We consider two strings of length n to be the same if one can be transformed into the other one by a sequence of π_1- and π_2-rearrangements (the sequence can be arbitrarily long and the permutations can be used in any order). How many different strings of length n consisting of letters `a`, ..., `z` are there?

Input and output

The first line contains a single integer n ($1 \leq n \leq 10$). The second line contains a permutation $\{1, \ldots, n\}$, the values $\pi_1(1)$, ..., $\pi_1(n)$ in order. The third line contains a permutation $\{1, \ldots, n\}$, the values $\pi_2(1)$, ..., $\pi_2(n)$ in order. Output the number of different strings as described above, modulo 1 000 003.

Example

Input:

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

Output:

```
5876
```