Just A Friendly Trick

Input file:	*standard input*
Output file:	*standard output*
Time limit:	4 seconds
Memory limit:	1024 mebibytes

Polina bought n artificial nails, used one of her n nail polishes of n different colors on each of them (she can use the same polish on multiple nails or not use some polish at all), and laid them in a row on the table to dry. While she was away, Vanya came in and decided to rearrange the first k nails from the left, that is, choose a permutation $p_1, \dots p_k$ and simultaneously move the i-th nail from the left to the p_i-th position for every i from 1 to k.

Vanya doesn't want Polina to notice anything weird, so he wants the sequence of the nail colors on the table to remain unchanged. Polina is very observant and might notice that something's off even with the same order of colors, so, just to be safe, Vanya wants to additionally have the number of cycles in the permutation he chose to be one of Polina's m favorite numbers.

Now Vanya wonders, for each choice of k from 1 to n, how many different permutations satisfying both conditions can he choose. Help him with that! Since the answers can be very large, output them modulo 998 244 353.

Input

The first line contains an integer n ($1 \le n \le 2 \cdot 10^5$): the number of nails on the table.

The next line contains n integers $col_1, \dots, col_n$ ($1 \le col_i \le n$): colors of nail polishes used on them.

The next line contains an integer m ($1 \le m \le n$): the number of Polina's favorite numbers.

The last line contains m distinct integers $x_1, \dots, x_m$ ($1 \le x_i \le n$, $x_i \ne x_j$ if $i \ne j$): Polina's favorite numbers.

Output

Print a single line with n integers: answers for each k from 1 to n.

Examples

standard input	*standard output*
3 1 1 2 2 1 3	1 1 1
6 1 1 3 2 6 6 4 6 3 4 2	0 1 2 2 1 2
10 10 2 2 10 10 10 2 10 10 10 5 1 3 9 7 2	1 1 2 3 7 23 53 233 1281 8454