Problem H
Permutation

Time Limit: 1 second

Memory Limit: 512 megabytes

A permutation of n elements is an arrangement of integers in the range {1..n}. We list permutations in increasing lexicographic order and index them starting from 1. For example, when $n = 5$, we have:

1	1 2 3 4 5
2	1 2 3 5 4
3	1 3 2 4 5
…	…
120	5 4 3 2 1

Given n and a permutation $a_1, a_2, \ldots, a_n$. You must process q queries, each query is a pair (i, j) $(1 \le i \le j \le n)$ where you have to swap the elements at position i and j. After each query, you must print the index of the new permutation.

NOTE: the queries don't affect each other! In other words, the permutation is not changed after each query.

Input

The first line of input contains two integers, n $(1 \le n \le 3 \times 10^5)$ and q $(1 \le q \le 10^5)$.

The second line of input contains n integers $a_1, a_2, \ldots, a_n$.

For the next q lines, each line contains two integers i and j denoting a query.

Output

You should output q lines, each line an integer denoting the index of the new permutation modulo $10^9 + 7$, in the same order as the input.

Sample Input	Sample Output
5 3 1 5 4 2 3 1 3 2 3 2 5	91 17 9