3109. Find the Index of Permutation 🔒

Description

Given an array `perm` of length `n` which is a permutation of `[1, 2, ..., n]`, return the index of `perm` in the lexicographically sorted array of all of the permutations of `[1, 2, ..., n]`.

Since the answer may be very large, return it **modulo** `10^9 + 7`.

Example 1:

Input: perm = [1,2]

Output: 0

Explanation:

There are only two permutations in the following order:

`[1,2]`, `[2,1]`

And `[1,2]` is at index 0.

Example 2:

Input: perm = [3,1,2]

Output: 4

Explanation:

There are only six permutations in the following order:

`[1,2,3]`, `[1,3,2]`, `[2,1,3]`, `[2,3,1]`, `[3,1,2]`, `[3,2,1]`

And `[3,1,2]` is at index 4.

Constraints:

- `1 <= n == perm.length <= 10^5`
- `perm` is a permutation of `[1, 2, ..., n]`.