Problem 3109: Find the Index of Permutation

Problem Information

Difficulty: Medium
Acceptance Rate: 35.23%
Paid Only: Yes
Tags: Array, Binary Search, Divide and Conquer, Binary Indexed Tree, Segment Tree, Merge Sort, Ordered Set

Problem 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** `109 + 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 <= 105` * `perm` is a permutation of `[1, 2, ..., n]`.

Code Snippets

C++:

```
class Solution {
public:
int getPermutationIndex(vector<int>& perm) {

}
};
```

Java:

```
class Solution {
public int getPermutationIndex(int[] perm) {

}
}
```

Python3:

```
class Solution:
def getPermutationIndex(self, perm: List[int]) -> int:
```