

# D. On Sum of Number of Inversions in Permutations

time limit per test: 3 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

You are given a permutation  $p$ . Calculate the total number of inversions in all permutations that lexicographically do not exceed the given one.

As this number can be very large, print it modulo  $1000000007 (10^9 + 7)$ .

### Input

The first line contains a single integer  $n (1 \leq n \leq 10^6)$  — the length of the permutation. The second line contains  $n$  distinct integers  $p_1, p_2, \dots, p_n (1 \leq p_i \leq n)$ .

### Output

Print a single number — the answer to the problem modulo  $1000000007 (10^9 + 7)$ .

### Examples

input
2 2 1
output
1

input
3 2 1 3
output
2

### Note

Permutation  $p$  of length  $n$  is the sequence that consists of  $n$  distinct integers, each of them is from 1 to  $n$ .

An inversion of permutation  $p_1, p_2, \dots, p_n$  is a pair of indexes  $(i, j)$ , such that  $i < j$  and  $p_i > p_j$ .

Permutation  $a$  do not exceed permutation  $b$  lexicographically, if either  $a = b$  or there exists such number  $i$ , for which the following logical condition fulfills: AND  $(a_i < b_i)$ .