

# Inversions

2022/2023 SEASON – FOURTH ROUND



Ikortv loves order. He has natural numbers  $n, k$  and a sequence of natural numbers  $x_1, x_2, \dots, x_n$ .

We call an inversion a pair of indices  $(i, j)$  such that  $1 \leq i < j \leq n$  and  $x_i > x_j$ . We call a subarray a continuous sequence of elements in an array.

Ikortv does not love inversions. He wants to break the array into subarrays such that the number of inversions in each subarray is at most  $k$ . Find in how many ways this can be done modulo  $10^6 + 3$ .

## Input

The first line of the file **inversions.in** contains the numbers  $n$  and  $k$  and the second line contains  $n$  numbers -  $x_1, x_2, \dots, x_n$

## Output

On the single line of the file **inversions.out**, print the remainder of the number of ways when divided by  $10^6 + 3$ .

## Constraints

$$1 \leq n \leq 6 * 10^3$$

$$1 \leq x_i \leq 10^9$$

$$1 \leq k \leq 10^{18}$$

**Time limit: 0.6 sec.**

**Memory limit: 256 MB.**

## Sample test

Input (inversions.in)	Output (inversions.out)
4 2	7
4 1 2 3	