Problem E. Another Inversion Counting

Time limit 2000 ms
Memory limit 256MB

Problem Description

You are given a sequence of N integers $a_1, a_2, \ldots, a_N$ and an integer K. You need to construct a new sequence S by repeating the original sequence K times with rotations applied.

Specifically, for each i from 1 to K:

- Rotate the original sequence by moving the first $(i-1) \mod N$ elements to the end.
- Append this rotated sequence to S.

For example, if the original sequence is $a = [1, 2, 3]$ and $K = 3$, the sequence S is constructed as follows:

- Rotate by 0 positions: $[1, 2, 3]$
- Rotate by 1 positions: $[2, 3, 1]$
- Rotate by 2 positions: $[3, 1, 2]$

The final sequence $S = [1, 2, 3, 2, 3, 1, 3, 1, 2]$.

Your task is to calculate the number of inversion pairs in the sequence S.

An inversion pair is a pair of indices (i, j) such that $1 \leq i < j \leq N \times K$ and $S_i > S_j$.

Input format

The first line contains two integers N and K ($1 \leq N \leq 2 \times 10^5, 1 \leq K \leq 10^{16}$) — the length of the sequence and the number of times it is repeated with rotations.

The second line contains N integers $a_1, a_2, \ldots, a_N$ ($1 \leq a_i \leq 10^9$) — the elements of the sequence.

Output format

Output a single integer — the number of inversion pairs in the final sequence S, the answer need to modulo 998244353.

Subtask score

Subtask	Score	Additional Constraints
1	5	$N \times K \leq 5000$
2	15	$N \times K \leq 2 \times 10^5$
3	20	$N \leq 2 \times 10^5, K \leq 500$
4	25	a_i is distinct
5	35	No constraints

Sample

Sample Input 1

```
3 3
1 2 3
```

Sample Output 1

```
13
```

Sample Input 2

```
3 5
1 2 3
```

Sample Output 2

```
36
```