STELELE INFORMATICII

Liceul Teoretic Internațional de Informatică București

Problem Impostors

Input file	`stdin`
Output file	`stdout`

There are N rooms in a row and N impostors such that initially (at second $t = 0$), the impostor i is in room i. From room i, there is a directed vent to room p_i, such that no two vents have the same destination (forming a permutation of integers from 1 to N). The impostors move in the following way: the impostor who was in room i at second t will move ("vent") to room p_i at second $t + 1$.

After K seconds you can track where each impostor is: the i^{th} is in room q_i. Now, you wonder: how many vent configurations (permutations p) can lead to this? Since the answer can be very large, output it modulo $10^9 + 7$. Note that your tracking device might be faulty, so the answer can be 0.

Task

Write a program that, knowing N, K and the position of each impostor after K seconds, calculates how many possible vent permutations exist.

Input data

The first line of input contains two integers N and K.

The second line contains N integers q_i ($1 \leq q_i \leq N$), representing the positions of the impostors after K seconds. It is guaranteed that q forms a permutation of integers from 1 to N.

Output data

The output consists of one integer: the number (modulo $10^9 + 7$) of permutations p, such that after K seconds, impostor i would be in room q_i for each i.

Constraints

- $2 \leq N \leq 10^5$
- $2 \leq K \leq 10^{18}$.

#	Points	Constraints
1	11	$N \leq 8$ and $K \leq 20$
2	11	$N \leq 14$
3	28	$K = 2$
4	16	$N \leq 500$
5	20	$N \leq 10^4$
6	14	No additional restrictions

Examples

stdin	stdout	Explanations
3 3 1 2 3	3	The valid permutations p are (1, 2, 3), (2, 3, 1) and (3, 1, 2).
5 2 3 1 5 4 2	0	There exists no valid permutation p.