

Deque and Balls

Input file: standard input
Output file: standard output
Time limit: 2 seconds
Memory limit: 256 megabytes

There are n balls labeled from 1 to n and a deque. You are going to put balls into the deque. In i -th turn, you need to push the p_i -th ball to the deque. Each ball will be put to both ends of the deque with equal probability.

Let the sequence (x_1, x_2, \dots, x_n) be the labels of the balls in the deque from left to right. The beauty of the deque $B(x_1, x_2, \dots, x_n)$ is defined as follows: $B(x_1, x_2, \dots, x_n) = \left(\sum_{i=1}^{n-1} [x_i > x_{i+1}] \right)^k$ (k is a number given to you). Note that $[condition] = 1$ if *condition* is true, or 0 otherwise.

You need to find the expected value of $B(x_1, x_2, \dots, x_n)$.

Input

The input contains multiple test cases. For each test case:

The first line contains two integers n and k ($1 \leq n \leq 1000, 1 \leq k \leq 50$) – the number of balls and the number given to you. The second line contains n distinct integers: p_1, p_2, \dots, p_n ($1 \leq p_i \leq n$).

The sum of values of n in all test cases doesn't exceed 1000.

Output

For each test case, if the expected value is E , you should output $E \cdot 2^n \bmod (10^9 + 7)$.

Examples

| standard input | standard output |
|----------------|-----------------|
| 1 3 | 0 |
| 1 | 2 |
| 2 3 | 20 |
| 1 2 | |
| 3 3 | |
| 1 2 3 | |