Problem E. Inverse KMP

Input file:	`stdin`
Output file:	`stdout`
Time limit:	1 second
Memory limit:	512 megabytes

bobo has just learnt Knuth-Morris-Pratt (KMP) algorithm.

For string $S = s_1 s_2 \ldots s_n$, $\text{KMP}(S) = (f_2, f_3, \ldots, f_n)$ where f_i is the maximum $j < i$ where $s_1 s_2 \ldots s_j = s_{i-j+1} s_{i-j+2} \ldots s_i$.

Given $f_2, f_3, \ldots, f_n$ and the size of alphabet, find out the number of strings S where $\text{KMP}(S) = (f_2, f_3, \ldots, f_n)$ modulo $(10^9 + 7)$.

Input

The first line contains 2 integers n and c, which denotes the length of the string and the size of alphabet, respectively ($2 \le n \le 10^5, 1 \le c \le 10^9$).

The second line contains $(n-1)$ integers $f_2, f_3, \ldots, f_n$ ($0 \le f_i < i$).

It is guaranteed that there exists at least one solution.

Output

A single integer denotes the number of strings.

Sample input and output

stdin	stdout
3 3 0 0	12
5 1000000000 1 2 3 4	1000000000