Problem M. Mystique as Iris

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

The following two steps, on an array x consisting of positive integers, are called an operation:

1. Select any two adjacent elements in x, decrease one of them by 1, and set the other to 0.
2. Remove all zeros from x.

We call x *mystic* if and only if it can be transformed into an empty sequence after a finite number of operations (possibly zero).

You are given an array a consisting of n integers, as well as an integer m. Each element of a is either an integer from 1 to m or -1. Your task is to replace every occurrence of -1 in a with any integer from 1 to m.

Determine the number of distinct mystic arrays a that can be obtained after the replacement. Since the answer can be very large, output it modulo $10^9 + 7$.

Input

The first line of the input contains two integers n and m ($2 \le n \le 10^6$, $1 \le m \le 10^8$).

The second line of the input contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le m$ or $a_i = -1$).

Output

Output a single integer, representing the number of distinct mystic sequences a that can be obtained, modulo $10^9 + 7$.

Examples

standard input	standard output
2 2 -1 -1	3
6 10 -1 -1 -1 -1 1 7	9125

Note

In the first test, the array a is $[-1, -1]$. By replacing both -1-s, one possible result is $[1, 2]$. In this case, we select the two adjacent numbers: decrease the first by 1 and set the second to 0, obtaining $[0, 0]$. After removing all zeros, the sequence becomes empty. Hence, $[1, 2]$ is a mystic sequence.

Similarly, if we replace the -1-s with $[1, 1]$ or with $[2, 1]$, both sequences can also be reduced to empty. Therefore, the total number of distinct mystic sequences is 3.