

# Task: NAD

## Supersequences

---

UFAM Workshop, contest #6. Source file nad.\* Available memory: 512 MB.

In this task we will consider alphabet as a set of integers  $\{1, 2, \dots, a\}$ . Each letter of each word in this task belongs to this alphabet. You are given a word  $s$  of length  $n$ . You have to calculate the number of words  $S$  of length  $m$ , such that  $s$  is subsequence of  $S$ . You should calculate it modulo  $10^9 + 7$ .

### Input

In the first line of the input you are given three integers  $n, m, a$  ( $1 \leq n \leq 10^7, n \leq m \leq 10^9, 1 \leq a \leq 10^9$ ). They specify the length of word  $s$ , the length of  $S$  and the size of alphabet. In the second line you are given a sequence  $s_1, s_2, \dots, s_n$  ( $1 \leq s_i \leq a$ ) of length  $n$ , the consecutive letters of  $s$ .

### Output

You should output only one integer – the number of different words of length  $m$  with letters from the alphabet  $\{1, 2, \dots, a\}$ , whose subsequence is  $s$ . Result should be written modulo  $10^9 + 7$ .

### Example

For the input data:

3 4 2  
1 2 1

the correct result is:

5

**Explanation to the example:** There are 16 words of length 4 with letters from  $\{1, 2\}$ . There they are:

1111, 1112, 1121, 1122, 1211, 1212, 1221, 1222, 2111, 2112, 2121, 2122, 2211, 2212, 2221, 2222.

Word 121 exists in five of them as a subsequence (they are underlined).