

Statement problem Supersum

Let A be an array of N integers. We define *green* a process applied on array A in two steps:

- Step 1: Let B be an array of integers named B . Initially, the array B is empty. For all the subsets of the array A , including the void set, the sum of each subset is calculated, and the resulted number is added to the array B .
- Step 2: A is replaced by B . After that, B becomes empty again.

Your task is to calculate the sum of the elements of the array A modulo M after the *green* process is applied K times.

Input

The input will be read from *stdin* which contains on the first line the numbers N , K and M . The next line contains N numbers, the numbers of the initial array A .

Output

The output will be written to *stdout*, which contains a single number, the sum of the elements of the array A , modulo M after the *green* is applied K times.

Restrictions

- $1 \leq N \leq 50$
- $1 \leq K \leq 10^9$
- $1 \leq M \leq 10^9 + 7$
- $0 \leq A_i \leq M$
- M is odd
- For 20 points: $M = 10^9 + 7$, $K = 1$
- For another 10 points: $M = 10^9 + 7$, $K = 2$
- For another 10 points: $K = 1$
- For another 20 points: $M \leq 500$, $K \leq 50000$
- For another 20 points: $M = 10^9 + 7$, $K \leq 50000$

Example

stdin	stdout
3 1 9999 1 2 3	24
3 4 29 0 23 0	26
4 50000 49999 2 0 2 3	43310

Explanation

In the first example, final array after the *green* operation is: 0, 1, 2, 3, 3, 4, 5, 6, therefore, the sum is 24.