

E. Xor-sequences

time limit per test: 3 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

You are given n integers a_1, a_2, \dots, a_n .

A sequence of integers x_1, x_2, \dots, x_k is called a "xor-sequence" if for every $1 \leq i \leq k-1$ the number of ones in the binary representation of the number $x_i x_{i+1}$'s is a multiple of 3 and for all $1 \leq i \leq k$. The symbol \oplus is used for the binary exclusive or operation.

How many "xor-sequences" of length k exist? Output the answer modulo $10^9 + 7$.

Note if $a = [1, 1]$ and $k = 1$ then the answer is 2, because you should consider the ones from a as different.

Input

The first line contains two integers n and k ($1 \leq n \leq 100, 1 \leq k \leq 10^{18}$) — the number of given integers and the length of the "xor-sequences".

The second line contains n integers a_i ($0 \leq a_i \leq 10^{18}$).

Output

Print the only integer c — the number of "xor-sequences" of length k modulo $10^9 + 7$.

Examples

input
5 2 15 1 2 4 8
output
13

input
5 1 15 1 2 4 8
output
5