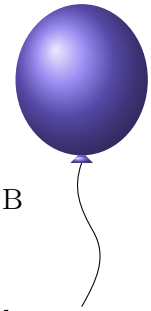
K Pizza



Time limit: 1.0s
Memory limit: 1024MB

Pizza is the best food ever made, something you can't imagine until you taste it (especially pineapple pizza).

You want to give everyone pizza for the International Pizza Day. There are quite a few types of pizza. You compiled some information about the preferences of each of your guests. For every guest i, you know the set a_i of types of pizza that they like, represented as a bitmask: a set $\{v_1, \ldots, v_k\}$ with elements ≥ 0 is written as the number $2^{v_1} + \ldots + 2^{v_k}$.

Let x_i be the set of pizza types person i gets to eat (represented as a bitmask). There are some constraints that you need to ensure in order for everything to be perfect.

1. There is a set of pizza types s (represented as a bitmask). Every type of pizza in s should be served to at least one guest, and everything not in s should not be served. Formally, x_1 `OR` x_2 `OR` ... `OR` $x_n = s$.
2. There is a set of pizza types t (represented as a bitmask). Every type of pizza in t should be served to an odd number of guests, and every type of pizza not in t should be served to an even number of guests (this request came to you in a dream, so you must follow it to make the dream come true). Formally, x_1 `XOR` x_2 `XOR` ... `XOR` $x_n = t$.
3. Every guest should be served at least all the pizza types that they like. Formally, $a_i \subseteq x_i$.

Since it's International Pizza Day soon, you want to delight yourself with a problem. How many ways are there to serve everyone while still following the rules above? Two ways are different if some guest i gets different sets x_i. It is alright if the answer contains scenarios where you serve no pizza to someone (it is not alright for the party though). Since this number can be very large, you want to compute it modulo $10^9 + 7$.

Input

The first line contains three integers: n, s, and t ($1 \leq n \leq 10^5$, $0 \leq s, t \leq 2^{30} - 1$).

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($0 \leq a_i \leq s$).

Output

Print a single integer: how many ways are there to serve everyone, modulo $10^9 + 7$.

Samples

Sample input 1	Sample output 1
3 11 10 8 2 0	12

Sample input 2	Sample output 2
3 7 5 2 3 6	0

Sample input 3	Sample output 3
10 31 24 5 17 1 6 0 30 12 15 8 23	8388608