Problem F. Random XOR

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

There is an array a containing n integers. Also, there is initially empty array b. Some elements of a are going to be added to b. Each element is added with probability P independently from others. Then the value of s is to be computed:

$$s = \oplus_{i=0}^{|b|} b_i$$

where $\oplus$ is bitwise exclusive OR (if the array b is empty, s equals to zero). You are required to compute the expected value of s^2.

Input

The first line of input contains three integers n, X and Y. The probability P is equal to $\frac{X}{Y}$.

The second line contains n integers a_i divided by spaces — elements of the array a.

$$1 \le n \le 10^5$$
$$0 \le X < 10^9 + 7$$
$$0 < Y < 10^9 + 7$$
$$X \le Y$$
$$0 \le a_i < 10^9 + 7$$

Output

The answer can be always represented as a fraction $\frac{u}{v}$ where u and v are co-prime numbers and $v \ne 0$ mod $(10^9 + 7)$ You are required to output only one number — $u \times v^{-1} \mod (10^9 + 7)$

Example

standard input	standard output
3 1 2 2 8 10	42