C. Magic Formulas

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

People in the Tomskaya region like magic formulas very much. You can see some of them below.

Imagine you are given a sequence of positive integer numbers $p_1, p_2, ..., p_n$. Lets write down some magic formulas:

Here, "`mod`" means the operation of taking the residue after dividing.

The expression means applying the bitwise xor (excluding "OR") operation to integers x and y. The given operation exists in all modern programming languages. For example, in languages C++ and Java it is represented by "^", in Pascal — by "xor".

People in the Tomskaya region like magic formulas very much, but they don't like to calculate them! Therefore you are given the sequence p, calculate the value of Q.

Input
The first line of the input contains the only integer n ($1 \le n \le 10^6$). The next line contains n integers: $p_1, p_2, ..., p_n$ ($0 \le p_i \le 2 \cdot 10^9$).

Output
The only line of output should contain a single integer — the value of Q.

Examples

input
3 1 2 3

output
3