Salt

Problem ID: salt

Given an array a of length n, find the minimum nonnegative integer s such that for some $L \geq 0$, $a_i = (L+i) \text{ XOR } s$ for all $0 \leq i \leq n-1$. The existence of at least one such s is guaranteed by the input.

Input

The input consists of 2 lines, the first line containing a single integer n ($1 \leq n \leq 10^6$), and the second line containing n space-separated integers $a_0, a_1, \ldots, a_{n-1}$ ($0 \leq a_i \leq 10^{18}$).

Output

Output a single line, containing the integer s.

Sample Input 1	Sample Output 1
3 6 7 0	4