XOR Again?

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

Given an array $A_1, A_2, \ldots A_N$ of N integers. Solve the following problem for every M ($1 \leq M \leq N$):

- Divide the array into exactly M consecutive blocks.
- The cost of each block is its bitwise XOR. The cost of division is the bitwise OR of its blocks' costs.
- Find the minimum cost of division.

Input

The first line contains one integer N ($1 \leq N \leq 10^6$). The second line consists of N space-separated integers $A_1, A_2, \ldots, A_N$ ($0 \leq A_i \leq 10^6$).

Output

Print one line consisting of N integers. The i-th integer is the answer for the problem with $M = i$.

Examples

standard input	standard output
6 0 3 10 2 4 5	10 10 11 11 11 15
4 0 1 0 1	0 0 1 1