



Bangladesh Artificial Intelligence Olympiad (Preliminary)

2:06:20

- O Dashboard
- A. Welcome to Bang...
- B. Take Angle, Giv...
- C. Odd Subset XOR
- D. Can you predict...
- E. Cycle of life
- F. Lost in bracket...
- G. Sum in summer
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- Announcements
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C. Odd Subset XOR

Limits 1s, 512 MB

You are given a set of n distinct positive integers. There can be many subsets of this set. However, we are only interested in the subsets of odd length.

Let us define the strength of a set as the bit-wise XOR of all the elements of the set.

The task is to find the bit-wise XOR of the strengths of all the subsets of odd length, of the given set.

Input

The first line contains n ($0 < n < 10^6$).

The second line contains n distinct positive integers. All these integers are less than 10^9 .

Output

Print only one integer, the bit-wise XOR of the strengths of all the subsets of odd length, of the given set.

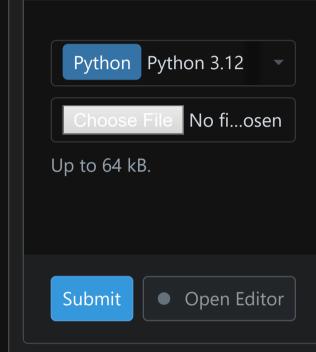
Sample

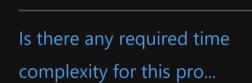
Input	Output
3	0
1 2 3	
The subsets of odd lengths are $\{1\}$, $\{2\}$, $\{3\}$, $\{1,2,3\}$. The strengths of these sets are 1 , 2 , 3 , 0 . Bitwise XOR of these numbers is 0 .	

In most programming languages, the ^ operator does the bit-wise XOR operation.

Submit

Choose a programming language, select your solution file, and click on Submit.





Request

② 28m ago

Clarifications