Problem F. Nim Cheater

Input file:	`standard input`
Output file:	`standard output`
Balloon Color:	`Purple`

The judges really like nim game, so they decided to put yet another nim game problem into the problem set (sorry for that in advance).

Nim Game is a well-known game. The rules of the game are actually simple. The game consists of M piles and N stones. Each pile has a number of stones inside it, and each stone belongs to exactly one pile. Two players play the game alternately. In each step the player chooses a pile, and removes as many stones from it as he wishes. The player whose turn comes while all the piles are empty loses the game. Tricky game huh?

It can be proven that the winner can be determined before the start of the game, assuming both players play optimally. To determine the winner you must first calculate the logical XOR operator for all piles sizes, let's denote this value as X.

$X = S_1 \ xor \ S_2 \ xor \ ... \ xor \ S_M$

Where S_i denotes the size of the i^{th} pile. After that you just need to examine the value X. If X equals to 0 then the player to start **second** can always find a way to win, otherwise the player to start **first** can always find a way to win.

After learning this great game you decided to play it with your friend after this contest is finished. You arranged some piles, placed a number of stones inside each pile and decided that you would play **first**. Before starting the game your friend got busy, and you were given a chance of being alone with the piles for a few seconds!

You decided to guarantee your win. You have only a few seconds before your friend returns, so the only action you can do is to remove some (possibly zero) stones from some (possibly zero) piles, and throw them away. Since you don't want to be caught you want to do so as fast as possible. You are asked to determine the minimum number of stones you need to remove.

Input

The first line contains a single integer T, denoting the number of test cases.

The first line of each test case contains a single integer M ($1 \leq M \leq 10^5$), indicating the number of piles.

The next line contains M space-separated integers S_i ($1 \leq S_i \leq 10^9$), the number of stones in the i^{th} pile.

Output

For each test case print one line containing a single integer, the minimum amount of stones you should remove so that you can win the game. It is guaranteed that the answer exists and you can guarantee your win after removing some (possibly zero) stones.

Example

standard input	standard output
2 2 2 3 3 2 3 1	0 1