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Bit Manipulation: Lonely Integer
by dheeraj

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Check out the resources on the page's right side to learn more about bit manipulation. The video tutorial is by Gayle Laakmann McDowell, author of the best-selling interview book Cracking the Coding Interview.

Consider an array of n integers, $A = [a_0, a_1, \ldots, a_{n-1}]$, where all but one of the integers occur in pairs. In other words, every element in A occurs exactly twice except for one unique element.

Given A, find and print the unique element.

Input Format

The first line contains a single integer, n, denoting the number of integers in the array.
The second line contains n space-separated integers describing the respective values in A.

Constraints

- $1 \leq n < 100$
- It is guaranteed that n is an odd number.
- $0 \leq a_i \leq 100$, where $0 \leq i < n$.

Output Format

Print the unique number that occurs only once in A on a new line.

Sample Input 0

```
1
1
```

Sample Output 0

```
1
```

Explanation 0
The array only contains a single 1, so we print 1 as our answer.

Sample Input 1

```
3
1 1 2
```

Sample Output 1

```
2
```

Explanation 1
We have two 1's and one 2. We print 2, because that's the only unique element in the array.
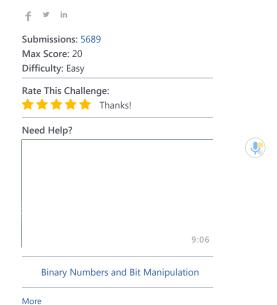
Sample Input 2

```
5
0 0 1 2 1
```

Sample Output 2

2

Explanation 2

We have two **0**'s, two **1**'s, and one **2**. We print **2**, because that's the only unique element in the array.

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Submissions: 5689
Max Score: 20
Difficulty: Easy

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★★★★★   Thanks!

Need Help?

9:06

Binary Numbers and Bit Manipulation

More

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```csharp
1   using System;
2   using System.Collections.Generic;
3   using System.IO;
4   using System.Linq;
5 ▾ class Solution {
6
7 ▾     static void Main(String[] args) {
8           //1) Cualquier número xor'd consigo mismo dará cero.
9               //2) Cualquier número xor'd con cero dará el número.
10              //3) Se nos dice que hay un número impar de números en la matriz
11              //    y que son todos los pares del mismo número, aparte de uno.
12          //Así que si xor todos los números de la matriz junto,
13          //entonces cualquier que son los mismos se anulan - y
14          //dar cero como el resultado de todos los xors.
15          //Entonces nos quedamos con el número único,
16          //que xor es con cero y así da el número único como la respuesta.
17          int n = Convert.ToInt32(Console.ReadLine());
18          string[] a_temp = Console.ReadLine().Split(' ');
19          int[] a = Array.ConvertAll(a_temp, e => int.Parse(e) );
20
21          List<int> lista = new List<int>();
22          for (int i = 0; i < n; i++)
23 ▾        {
24              if (lista.Contains(a[i]))
25 ▾            {
26
27                  lista.Remove(a[i]);
28              }
29              else
30 ▾            {
31                  lista.Add(a[i]);
32              }
33          }
34          Console.WriteLine(lista[0]);
35
36      }
37  }
```

Line: 21 Col: 13

⬆ Upload Code as File   ☐ Test against custom input   Run Code   Submit Code

Congrats, you solved this challenge!

✔ Test Case #0   ✔ Test Case #1   ✔ Test Case #2

✔ Test Case #3   ✔ Test Case #4   ✔ Test Case #5

✔ Test Case #6   ✔ Test Case #7   ✔ Test Case #8

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