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Bit Manipulation: Lonely Integer

by [dheeraj](#)

Problem

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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, $A = [a_0, a_1, \dots, a_{n-1}]$, 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

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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9:06

Binary Numbers and Bit Manipulation

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C++



1

```
1 #include <map>
2 #include <set>
3 #include <list>
4 #include <cmath>
5 #include <ctime>
6 #include <deque>
7 #include <queue>
8 #include <stack>
9 #include <string>
10 #include <bitset>
11 #include <cstdio>
12 #include <limits>
13 #include <vector>
14 #include <climits>
15 #include <cstring>
16 #include <cstdlib>
17 #include <fstream>
18 #include <numeric>
19 #include <sstream>
20 #include <iostream>
21 #include <algorithm>
22 #include <unordered_map>
23
24 using namespace std;
25
26 int lonely_integer(vector < int > a) {
27     int cont[101];
28     for(int i =0; i<=100; i++) {
29         cont[i]=0;
30     }
31
32     for(int i =0; i<a.size(); i++) {
33         cont[a[i]]++;
34     }
35
36     for(int i =0; i<=100; i++) {
37         if(cont[i] == 1) return i;
38     }
39     return -1;
40 }
41
42 int main(){
43     int n;
44     cin >> n;
45     vector<int> a(n);
46     for(int a_i = 0;a_i < n;a_i++){
47         cin >> a[a_i];
48     }
49     cout << lonely_integer(a) << endl;
50     return 0;
51 }
52
```

Line: 39 Col: 15

 Upload Code as File ☐ Test against custom input

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✓ Test Case #0

✓ Test Case #3

✓ Test Case #6

✓ Test Case #1

✓ Test Case #4

✓ Test Case #7

✓ Test Case #2

✓ Test Case #5

✓ Test Case #8

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