XOR Game 3

Today, as a friendship gift, Tulasi gave Hanifa n integers a1,a2,…,an and challenged her to choose an integer X such that the value max1≤i≤n(ai⊕X) is minimum possible, where ⊕ denotes the bitwise XOR operation.

As always, Hanifa is too lazy, so you decided to help her and find the minimum possible value of max1≤i≤n(ai⊕X).

Input Format

The first line contains integer n (1 ≤ n ≤ 10^5).

The second line contains n integers a1,a2,…,an (0 ≤ ai ≤ 2^30−1).

Constraints

1 ≤ n ≤ 10^5 0 ≤ ai ≤ (2^30)−1 , for 1<=i<=n

Output Format

Print one integer — the minimum possible value of max. 1 ≤ i ≤ n(ai⊕X).

Sample Input 0

```
3
1 2 3
```

Sample Output 0

```
2
```

Explanation 0

```
We can choose X as 3
```

Sample Input 1

```
2
1 5
```

Sample Output 1

```
4
```

Explanation 1

```
We can choose X as 5
```