Yet Another Minimax Problem

by zemen

You are given n non-negative integers, $a_0, a_1, \ldots, a_{n-1}$. We define the *score* for some permutation (p) of length n to be the maximum of $a_{p_i} \oplus a_{p_{i+1}}$ for $0 \leq i < n-1$.

Find the permutation with the minimum possible score and print its score.

Note: $\oplus$ is the exclusive-OR (XOR) operator.

Input Format

The first line contains single integer, n, denoting the number of integers.
The second line contains n space-separated integers, $a_0, a_1, \ldots, a_{n-1}$, describing the respective integers.

Constraints

- $2 \leq n \leq 3000$
- $0 \leq a_i \leq 10^9$

Output Format

Print a single integer denoting the minimum possible score.

Sample Input 0

```
4
1 2 3 4
```

Sample Output 0

```
5
```

Sample Input 1

```
3
1 2 3
```

Sample Output 1

```
2
```

Explanation

Sample Case 0:
The permutation with the *minimum score* is $(3, 2, 1, 4)$:
$a_0 \oplus a_1 = 3 \oplus 2 = 1$

$a_1 \oplus a_2 = 2 \oplus 1 = 3$
$a_2 \oplus a_3 = 1 \oplus 4 = 5$

Because the permutation's score is the *maximum* of these values, we print 5 on a new line.

Sample Case 1:
The permutation with the *minimum score* is $(1, 3, 2)$:
$a_0 \oplus a_1 = 1 \oplus 3 = 2$
$a_1 \oplus a_2 = 3 \oplus 2 = 1$

Because the permutation's score is the *maximum* of these values, we print 2 on a new line.

Submissions:1232
Max Score:30
Difficulty: Medium
Rate This Challenge:
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Current Buffer (saved locally, editable) Java 7

```
1  import java.io.*;
2  import java.util.*;
3  import java.text.*;
4  import java.math.*;
5  import java.util.regex.*;
6
7  public class Solution {
8
9      public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }
```

Line: 1 Col: 1

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