

Alien Invasion

Aliens have invaded the Earth. Now it is the responsibility of DCE Coders to stop this invasion. Aliens interact with each other using encrypted messages which consist of numbers.

Now you have to find the key to decipher the messages. The key is actually the minimum xor of any two numbers in the message.

Given a single message, You have to find the key fast to know the aliens strategy and save Earth. Can you help them find the key ?

Input

N ($2 \leq N \leq 100000$)

$a_1 a_2 a_3 \dots a_N$

$0 \leq a_i \leq 10^9$

Output

The min XOR in single line.

Example

Input:

3

1 2 3

Output:

1