

G. Xor-MST

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

You are given a complete undirected graph with n vertices. A number a_i is assigned to each vertex, and the weight of an edge between vertices i and j is equal to $a_i \text{ xor } a_j$.

Calculate the weight of the minimum spanning tree in this graph.

Input

The first line contains n ($1 \leq n \leq 200000$) — the number of vertices in the graph.

The second line contains n integers a_1, a_2, \dots, a_n ($0 \leq a_i < 2^{30}$) — the numbers assigned to the vertices.

Output

Print one number — the weight of the minimum spanning tree in the graph.

Examples

input	Copy
5 1 2 3 4 5	
output	Copy
8	

input	Copy
4 1 2 3 4	
output	Copy
8	