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 $a_i \, xor \, a_j$.

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

Input

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

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

Output

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

Examples

input
5 1 2 3 4 5
output
8

input
4 1 2 3 4
output
8