Simple Game Problem

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Problem setter: Ahnaf Shahriar Asif

Let's play a game. You are given an array a, you have to find it's beauty value. The beauty value is obtained by **doing Bitwise OR operation to the numbers in each subset of the array a, then by summing all the subset OR results**. If you can find it properly, you win! If you don't understand what beauty value is, please have a look at the sample explanation.

Input

The first line contains an integer N, the size of the array a. Then the second line contains N integers, a_i

Output

Print the beauty of the array in one line. Output can be very large. So print it modulo $10^9 + 7$

Scoring

Subtask 1 (3 points): $N \leq 3$ and $a_i \leq 10^9$

Subtask 2 (7 points): $N \leq 10^5$ and $a_i \leq 10^9$, all a_i are same.

Subtask 3 (8 points): $N \leq 20$ and $a_i \leq 10^9$

Subtask 4 (11 points): $N \leq 10^5$ and $a_i \leq 10^9$, all a_i are power of 2.

Subtask 5 (11 points): $N \leq 10^5$ and $a_i \leq 10^9$, all a_i except exactly 1 number are same.

Subtask 6 (15 points): $N \leq 10^5$ and $a_i \leq 10^9$. There will be atmost 20 different numbers.

Subtask 7 (16 points): $N \leq 10^5$ and $a_i \leq 64$.

Subtask 8 (29 points): $N \leq 10^5$ and $a_i \leq 10^9$.

Examples

standard input	standard output
3 1 2 3	18
3 8 10 10	68

Note

There can be multiple occurrences of a number. They will be considered as different numbers.

For the First Sample test:

The subsets are: [1], [2], [3], [1, 2], [1, 3], [2, 3], [1, 2, 3]

1 –> 1

2 –> 2

3 –> 3

[1, 2] –> 1|2 –> 3

$[1, 3]$ –> $1|3$ –> 3

$[2, 3]$ –> $2|3$ –> 3

$[1, 2, 3]$ –> $1|2|3$ –> 3

So the total sum is: $1 + 2 + 3 + 3 + 3 + 3 + 3 = 18$