# E. Compatible Numbers

time limit per test: 4 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Two integers $x$ and $y$ are compatible, if the result of their bitwise "AND" equals zero, that is, $a \ \& \ b = 0$. For example, numbers $90$ ($10 \quad 11 \quad 010_2$) and $36$ ($100100_2$) are compatible, as $1011010_2 \ \& \ 100100_2 = 0_2$, and numbers $3$ ($11_2$) and $6$ ($110_2$) are not compatible, as $11_2 \ \& \ 110_2 = 10_2$.

You are given an array of integers $a_1, a_2, ..., a_n$. Your task is to find the following for each array element: is this element compatible with some other element from the given array? If the answer to this question is positive, then you also should find any suitable element.

## Input

The first line contains an integer $n$ ($1 \le n \le 10^6$) — the number of elements in the given array. The second line contains $n$ space-separated integers $a_1, a_2, ..., a_n$ ($1 \le a_i \le 4 \cdot 10^6$) — the elements of the given array. The numbers in the array can coincide.

## Output

Print $n$ integers $ans_i$. If $a_i$ isn't compatible with any other element of the given array $a_1, a_2, ..., a_n$, then $ans_i$ should be equal to -1. Otherwise $ans_i$ is any such number, that $a_i \ \& \ ans_i = 0$, and also $ans_i$ occurs in the array $a_1, a_2, ..., a_n$.

### Examples

| input |
| --- |
| 2<br>90 36 |
| **output** |
| 36 90 |

| input |
| --- |
| 4<br>3 6 3 6 |
| **output** |
| -1 -1 -1 -1 |

| input |
| --- |
| 5<br>10 6 9 8 2 |
| **output** |
| -1 8 2 2 8 |