

Problem I. Isn't It Beautiful?

Input file: *standard input*
 Output file: *standard output*
 Time limit: 1 second
 Memory limit: 256 mebibytes

We define the beauty of an array as its minimum excluded value (MEX): the smallest non-negative integer that does not belong to the array. A larger MEX corresponds to a more beautiful array.

You are given an array a of length n . You want to enhance it in terms of its beauty. To achieve this, you can choose a non-negative integer x and replace each element a_i with $a_i \& x$. Here, $\&$ denotes the bitwise AND operator: each bit of the result is equal to the logical AND of the respective bits of the operands.

Find the value of x that maximizes the beauty of the array.

Input

The first line of input contains a single integer t , the number of test cases ($1 \leq t \leq 10^5$).

Each test case is given on two lines.

The first of these lines contains a single integer n ($1 \leq n \leq 10^5$).

The second line contains n integers a_1, \dots, a_n ($0 \leq a_i < 2^{30}$).

It is guaranteed that the sum of n over all test cases does not exceed 10^5 .

Output

For each test case, print a single integer x that maximizes the MEX of the array formed by taking the bitwise AND of each element of a with x . This value should satisfy $0 \leq x < 2^{30}$; it can be shown that there always exists an optimal x in that range. If there are multiple solutions, print any one of them.

Example

<i>standard input</i>	<i>standard output</i>
1 6 13 11 40 10 33 19	23

Note

In the sample, we can choose $x = 23$, so the new array will be

$$[13\&23, 11\&23, 40\&23, 10\&23, 33\&23, 19\&23],$$

which is $[5, 3, 0, 2, 1, 19]$ with a MEX of 4. Another possible answer is $x = 19$.