A. Mocha and Math

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Mocha is a young girl from high school. She has learned so much interesting knowledge from her teachers, especially her math teacher. Recently, Mocha is learning about binary system and very interested in bitwise operation.

This day, Mocha got a sequence a of length n. In each operation, she can select an arbitrary interval $[l, r]$ and for all values i $(0 \leq i \leq r - l)$, replace a_{l+i} with $a_{l+i} \,\&\, a_{r-i}$ at the same time, where $\&$ denotes the bitwise AND operation. This operation can be performed **any number of times**.

For example, if $n = 5$, the array is $[a_1, a_2, a_3, a_4, a_5]$, and Mocha selects the interval $[2, 5]$, then the new array is $[a_1, a_2 \,\&\, a_5, a_3 \,\&\, a_4, a_4 \,\&\, a_3, a_5 \,\&\, a_2]$.

Now Mocha wants to minimize the maximum value in the sequence. As her best friend, can you help her to get the answer?

Input

Each test contains multiple test cases.

The first line contains a single integer t $(1 \leq t \leq 100)$ — the number of test cases. Each test case consists of two lines.

The first line of each test case contains a single integer n $(1 \leq n \leq 100)$ — the length of the sequence.

The second line of each test case contains n integers $a_1, a_2, \ldots, a_n$ $(0 \leq a_i \leq 10^9)$.

Output

For each test case, print one integer — the minimal value of the maximum value in the sequence.

Example

input Copy

```
4
2
1 2
3
1 1 3
4
3 11 3 7
5
11 7 15 3 7
```

output Copy

```
0
1
3
3
```

Note

In the first test case, Mocha can choose the interval $[1, 2]$, then the sequence becomes $[0, 0]$, where the first element is $1 \,\&\, 2$, and the second element is $2 \,\&\, 1$.

In the second test case, Mocha can choose the interval $[1, 3]$, then the sequence becomes $[1, 1, 1]$, where the first element is $1 \,\&\, 3$, the second element is $1 \,\&\, 1$, and the third element is $3 \,\&\, 1$.

Topic Stream Mashup: Bitwise Operations

Finished

Practice

→ **Virtual participation**

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ **Submit?**

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

→ **Last submissions**

Submission	Time	Verdict
268636175	Jul/03/2024 17:36	Accepted

→ **Contest materials**

- Topic tutorial video (en)