

PROBLEMS SUBMIT STATUS STANDINGS CUSTOM TEST

## B. Cat, Fox and the Lonely Array

time limit per test: 2 seconds  
memory limit per test: 256 megabytes

Today, Cat and Fox found an array  $a$  consisting of  $n$  non-negative integers.

Define the *loneliness* of  $a$  as the **smallest** positive integer  $k$  ( $1 \leq k \leq n$ ) such that for any two positive integers  $i$  and  $j$  ( $1 \leq i, j \leq n - k + 1$ ), the following holds:

$$a_i | a_{i+1} | \dots | a_{i+k-1} = a_j | a_{j+1} | \dots | a_{j+k-1},$$

where  $x | y$  denotes the **bitwise OR** of  $x$  and  $y$ . In other words, for every  $k$  consecutive elements, their bitwise OR should be the same. Note that the loneliness of  $a$  is well-defined, because for  $k = n$  the condition is satisfied.

Cat and Fox want to know how lonely the array  $a$  is. Help them calculate the loneliness of the found array.

### Input

Each test consists of multiple test cases. The first line contains a single integer  $t$  ( $1 \leq t \leq 10^4$ ) — the number of test cases. The description of the test cases follows.

The first line of each test case contains one integer  $n$  ( $1 \leq n \leq 10^5$ ) — the length of the array  $a$ .

The second line of each test case contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $0 \leq a_i < 2^{20}$ ) — the elements of the array.

It is guaranteed that the sum of  $n$  over all test cases doesn't exceed  $10^5$ .

### Output

For each test case, print one integer — the loneliness of the given array.

### Example

input

Copy

```
7
1
0
3
2 2 2
3
1 0 2
5
3 0 1 4 2
5
2 0 4 0 2
7
0 0 0 0 1 2 4
8
0 1 3 2 2 1 0 3
```

output

Copy

```
1
1
3
4
4
7
3
```

### Note

In the first example, the loneliness of an array with a single element is always 1, so the answer is 1.

In the second example, the OR of each subarray of length  $k = 1$  is 2, so the loneliness of the whole array is 1.

In the seventh example, it's true that  $(0|1|3) = (1|3|2) = (3|2|2) = (2|2|1) = (2|1|0) = (1|0|3) = 3$ , so the condition is satisfied for  $k = 3$ . We can verify that the condition is not true for any smaller  $k$ , so the answer is indeed 3.

Codeforces Round 945 (Div. 2)

Finished

Practice

→ Virtual participation

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Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

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

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
<a href="#">271443677</a>	Jul/20/2024 02:22	Accepted
<a href="#">271443334</a>	Jul/20/2024 02:13	Accepted
<a href="#">271443084</a>	Jul/20/2024 02:07	Accepted

→ Problem tags

binary searchbitmasksddata structuresgreedymathtwo pointers\*1300

No tag edit access

→ Contest materials

Announcement (en)

Tutorial (en)