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 ($1 \le k \le n$) such that for any two positive integers i and j ($1 \le i, j \le n - k + 1$), the following holds:

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

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 ($1 \le t \le 10^4$) — the number of test cases. The description of the test cases follows.

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

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

→ 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

→ 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
284514225	Oct/06/2024 02:15	Accepted
277980238	Aug/25/2024 04:39	Accepted
277970479	Aug/25/2024 00:23	Accepted
277970107	Aug/25/2024 00:16	Runtime error on test 1
277968578	Aug/24/2024 23:53	Runtime error on test 1
271443677	Jul/20/2024 02:22	Accepted
271443334	Jul/20/2024 02:13	Accepted
271443084	Jul/20/2024 02:07	Accepted

→ Problem tags

binary search   bitmasks   data structures   greedy   math   two pointers   *1300

No tag edit access

→ Contest materials

- Announcement (en) ✕
- Tutorial (en) ✕