B. Hamon Odyssey

time limit per test: 1 second
memory limit per test: 256 megabytes

Jonathan is fighting against DIO's Vampire minions. There are n of them with strengths $a_1, a_2, \ldots, a_n$.

Denote (l, r) as the group consisting of the vampires with indices from l to r. Jonathan realizes that the *strength* of any such group is in its weakest link, that is, the bitwise AND. More formally, the *strength* level of the group (l, r) is defined as

$$f(l, r) = a_l \,\&\, a_{l+1} \,\&\, a_{l+2} \,\&\, \ldots \,\&\, a_r.$$

Here, $\&$ denotes the bitwise AND operation.

Because Jonathan would like to defeat the vampire minions fast, he will divide the vampires into contiguous groups, such that each vampire is in **exactly** one group, and the **sum** of *strengths* of the groups is **minimized**. Among all ways to divide the vampires, he would like to find the way with the **maximum** number of groups.

Given the strengths of each of the n vampires, find the **maximum number** of groups among all possible ways to divide the vampires with the smallest sum of *strengths*.

Input

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

The first line of each test case contains a single integer n $(1 \le n \le 2 \cdot 10^5)$ — the number of vampires.

The second line of each test case contains n integers $a_1, a_2, \ldots, a_n$ $(0 \le a_i \le 10^9)$ — the individual strength of each vampire.

The sum of n over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output a single integer — the maximum number of groups among all possible ways to divide the vampires with the smallest sum of *strengths*.

Example

input

```
3
3
1 2 3
5
2 3 1 5 2
4
5 7 12 6
```

output

```
1
2
1
```

Note

In the first test case, the optimal way is to take all the n vampires as a group. So, $f(1, 3) = 1 \,\&\, 2 \,\&\, 3 = 0$.

In the second test case, the optimal way is to make 2 groups, $(2, 3, 1)$ and $(5, 2)$. So, $f(1, 3) + f(4, 5) = (2 \,\&\, 3 \,\&\, 1) + (5 \,\&\, 2) = 0 + 0 = 0$.

Codeforces Round 882 (Div. 2)
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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
256724311	Apr/15/2024 08:11	Accepted
256724128	Apr/15/2024 08:09	Wrong answer on test 2
256723955	Apr/15/2024 08:06	Wrong answer on test 1
256723877	Apr/15/2024 08:05	Wrong answer on test 1
256723758	Apr/15/2024 08:04	Wrong answer on test 2
256723710	Apr/15/2024 08:03	Wrong answer on test 2

→ **Problem tags**

bitmasks greedy two pointers *1000

No tag edit access

→ **Contest materials**

- Announcement (en)
- Tutorial (en)