1001.Multiply 2 Divide 2

Input file:	standard input
Output file:	standard output
Time limit:	7.5 seconds
Memory limit:	512 megabytes

Note:There is no dependency between this problem and problem Hack of Multiply 2 Divide 2.

Frank_DD has a sequence a of length n.

For each operation, he selects a number $a_i(1 \le i \le n)$ and changes it to $a_i \cdot 2$ or $\lfloor \frac{a_i}{2} \rfloor$.

Frank_DD wants to know the minimum number of operations to change the sequence a to a non-descending sequence.

Input

The first line of the input contains one integer T $(1 \le T \le 5$) — the number of test cases. Then T test cases follow.

In each test case:

The first line contains a single integer $n(1 \le n \le 10^5)$ — the length of sequence a.

The second line contains n integers $a_1, a_2, \ldots, a_n$ $(1 \le a_i \le 10^5)$ — the sequence a.

Output

For each test case, print a single integer in a single line — the minimum number of operations to change the sequence a to a non-descending sequence.

Example

standard input	standard output
2	4
7	11
6 3 3 4 10 8 2	
10	
9 9 4 7 3 10 10 8 4 3	

Note

In the first test case, we can use at least 4 operations to change the sequence a to a non-descending sequence:

$a_1 = \lfloor \frac{a_1}{2} \rfloor$

$a_5 = \lfloor \frac{a_5}{2} \rfloor$

$a_7 = a_7 \cdot 2$

$a_7 = a_7 \cdot 2$