F - Zero or One

Time Limit: 3 sec / Memory Limit: 1024 MB

Score : 500 points

Problem Statement

Given an integer N not less than 2, find the number of integers b not less than 2 such that:

- when N is written in base b, every digit is 0 or 1.

Find the answer for T independent test cases.

It can be proved that there is a finite number of desired integers b not less than 2 under the constraints of this problem.

Constraints

- $1 \leq T \leq 1000$
- $2 \leq N \leq 10^{18}$
- All values in the input are integers.

Input

The input is given from Standard Input in the following format, where test_i denotes the i-th test case:

$$
\begin{aligned}
&T\\
&\mathrm{test}_1\\
&\mathrm{test}_2\\
&\vdots\\
&\mathrm{test}_T
\end{aligned}
$$

Each test case is given in the following format:

$$
N
$$

Output

Print T lines. For $i = 1, 2, \ldots, T$, the i-th line should contain the answer to the i-th test case.

Sample Input 1 Copy

```
3
12
2
36
```

Sample Output 1 Copy

```
4
1
5
```

For the first test case, four b's satisfy the condition in the problem statement: $b = 2, 3, 11, 12$. Indeed, when $N = 12$ is written in base 2, 3, 11, and 12, it becomes 1100, 110, 11 and 10, respectively.

Language

C++ (GCC 9.2.1)

Source Code

```
1
```

* at most 512 KiB

* Your source code will be saved as Main.*extension*.

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