



Fibonacci Sequences (fibonacci)

Valerio is exploring sequences of integers by writing them on a blackboard. He starts a sequence with the numbers 1 and 2. Subsequently, he generates each new number according to one of the following rules:

- The next number is the sum of the two preceding numbers.
- The next number is twice the value of the preceding number.

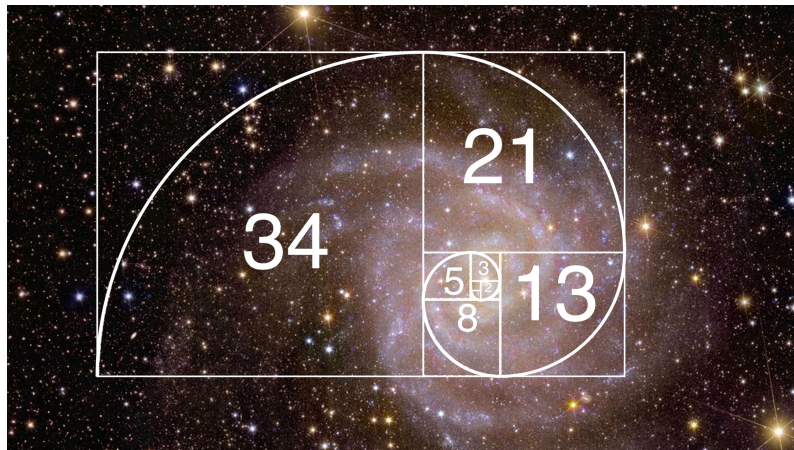


Figure 1: Visual representation of the Fibonacci sequence.

Now, Davide has seen the last number M written on the blackboard and is curious about all the possible sequences Valerio could have created.

Help Davide figure out how many different sequences Valerio could have written!

👁 Among the attachments of this task you may find a template file `fibonacci.*` with a sample incomplete implementation.

Input

The first line of the input file contains a single integer T , the number of test cases. T test cases follow, each of them consisting of a single line with an integer M .

Output






The output file must contain T lines corresponding to the test cases, each consisting of a single integer, the number of sequences that could have been written on the blackboard.

Constraints

- $1 \leq T \leq 100\,000$.
- $2 \leq M \leq 1\,000\,000\,000$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

- **Subtask 1** (0 points) Examples.

- **Subtask 2** (25 points) $T \leq 10$ and $M \leq 10^6$.

- **Subtask 3** (25 points) $T \leq 10$.

- **Subtask 4** (25 points) $M \leq 10^6$.

- **Subtask 5** (25 points) No additional limitations.


Examples

input	output
2 8 39	2 2
3 25 1008 824878080	1 54 78069600

Explanation

In the **first sample case**

- the number 8 can be the last number of 2 sequences: 1, 2, 4, 8 and 1, 2, 3, 5, 8;
- the number 39 can be the last number of 2 sequences: 1, 2, 3, 5, 8, 13, 26, 39 and 1, 2, 3, 6, 9, 15, 24, 39.