Even more sequences of bits P84293_en

Please compute the number of different sequences of length n, made up of only zeroes and ones, and with no more than two consecutive ones.

Input

Input consists of several cases, each with a natural number n between 0 and 10^9.

Output

For every case, print the number of different sequences of n bits that do not have more than two consecutive ones, modulo $10^9 + 7$.

Hint

A matrix can be powered to a natural number x with only $\Theta(\log x)$ products of matrices.

Sample input 1

```
0
1
2
3
4
5
20
1000
123456789
```

Sample output 1

```
1
2
4
7
13
24
223317
475857792
357891500
```

Problem information

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Generation: 2026-01-25T12:01:33.387Z