
Even more sequences of bits

P84293_en

Vuitè Concurs de Programació de la FME (2011-12-21)

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

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

Sample output

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

Problem information

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