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G · Simple Collatz Sequence

The *Simple Collatz Sequence* (SCS) starting at an integer **n**, is defined by the formula:

```
S(k) = (k/2 if k is even, else (k+1))
```

The sequence is then **n**, `S(`**n**`)`, `S(S(`**n**`))`, … until the value first reaches 1.

For example, starting at 11, we have:

```
11 -> 12 -> 6 -> 3 -> 4 -> 2 ->1
```

The sequence always ends at `1`. (Fun Fact: The *Hard Collatz Sequence* sends odd `k` to `3*k+1`. It is unknown whether that sequence always ends at `1`.)

Let `A(`**n**`)` = *number of steps in the SCS starting at **n***. For example, `A(11) = 6`.

Let `C(`**n**`)` = *the number of integers **m** for which* `A(`**m**`) = ` **n**. For example, the integers for which `A(n) = 6` are:

```
10, 11, 13, 24, 28, 30, 31, 64
```

So `C(6) = 8`.

Note that if **n** $> 2^m$, then `A(`**n**`)` $>$ **m** since we need to divide by 2 at least (**m**+1) times.

Write a program to compute `C(`**m**`)`.

(Continued on the next page.)

Input

Input consists of a single line which contains a decimal integer, *m,* (1 <= *m* <= 40000), which is the value for which `C(`*m*`)` is to be found.

Output

The output consists of a single line that contains the value of `C(`*m*`)` modulo `1000007`.

Sample 1:

Sample Input	Sample Output
6	8

Sample 2:

Sample Input	Sample Output
12345	540591