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## Balance (1)

P92795\_en

Novè Concurs de Programació de la UPC - Final (2011-09-21)

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Given  $n$  weights  $2^0, 2^1, \dots, 2^{n-1}$ , we have to place all the weights on a balance, one after another, in such a way that the right pan is never heavier than the left pan. Please compute the number of ways of doing this.

For example, for  $n = 2$  there are exactly three ways: placing first 2 on the left pan and then 1 on the right pan, placing first 2 on the left pan and then 1 on the left pan, and placing first 1 on the left pan and then 2 on the left pan. Note that, for instance, placing first 1 on the right pan and then 2 on the left pan is an incorrect way, since after placing 1 the right pan is heavier than the left pan.

### Input

Input consists of several cases, each with a natural number  $1 \leq n \leq 10^6$ .

### Output

For every case, print the number of correct ways modulo  $10^9 + 7$ .

### Sample input

```
1
2
3
1000000
```

### Sample output

```
1
3
15
386044009
```

### Observation

This problem is basically problem 4 of IMO 2011.

### Problem information

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