

Native Niuean

Input file: standard input
Output file: standard output
Time limit: 4 seconds
Memory limit: 1024 megabytes

After ending his international football career, Cristiano Ronaldo decided that he wants to become a citizen of Niue. To do so, he must pass an exam on Niuean traditions and culture. He answered all the questions easily except for the last one, so he needs your help. Can you help Ronaldo become a citizen of Niue? Here is the final question:

“For array $a_1, a_2, \dots, a_n$ of positive integers we define it’s **nativeness** as $\sum_{i=1}^n a_i \cdot f_i$, where $f_0 = 1, f_1 = 1$ and for $i \geq 2$: $f_i = a_{i-1}f_{i-1} + f_{i-2}$.

Also, we will call an array **niuean** if it is lexicographically smaller than it’s reverse.

You are given an integer m . Please calculate how many **niuean** arrays have **nativeness** not bigger than m . Give your answer modulo 998 244 353.”

Input

The first line contains one integer m ($1 \leq m \leq 10^{10}$).

Output

Output number of arrays modulo 998 244 353.

Examples

standard input	standard output
6	1
7	2
13	8
42	114
67	305
6767	3471737
676767	863282261
67676767	217404956
6767676767	691869515

Note

First international
 **Tahiti** 14–0 **Niue** 
([Apia, Western Samoa](#); 20 August 1983)^[1]

Biggest win
None

Biggest defeat
 **Niue** 0–19 **Papua New Guinea** 
([Apia, Western Samoa](#); 22 August 1983)