

## Problem C. Brave Seekers of Unicorns

Input file: *standard input*  
Output file: *standard output*  
Time limit: 1 second  
Memory limit: 512 mebibytes

You are a member of the Brave Seekers of Unicorns (BSU), the secret magical order. The BSU is fond of seeking unicorns. Recently, they have agreed to call an array  $a_1, a_2, \dots, a_k$  of  $k$  integers a *unicorn* if it satisfies the following conditions:

- the array is not empty ( $k > 0$ );
- there are no three consecutive elements with their bitwise XOR equal to zero ( $a_i \oplus a_{i+1} \oplus a_{i+2} \neq 0$  for all  $1 \leq i \leq k - 2$ );
- the array is strictly increasing ( $a_i < a_{i+1}$  for all  $1 \leq i \leq k - 1$ );
- the elements of the array are integers between 1 to  $n$ , inclusively ( $1 \leq a_i \leq n$  for all  $1 \leq i \leq k$ ).

For example, if  $n = 10$ , then the array  $[1, 4, 5, 9]$  is not a unicorn because  $1 \oplus 4 \oplus 5 = 0$ , but the array  $[2, 4, 7, 9]$  is a unicorn.

The Grand Master of the BSU has commanded you to calculate the number of unicorns. Since the number can be pretty large, you must compute it modulo 998 244 353.

### Input

The only line contains an integer  $n$  ( $1 \leq n \leq 10^6$ ).

### Output

Print the number of unicorns modulo 998 244 353.

### Examples

standard input	standard output
1	1
2	3
3	6
5	26
322	782852421