Eminor Array

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

Gew is looking for "Eminor" sequences $[a_1, a_2, \ldots, a_m]$ which have the following properties:

- The sequence is not empty ($m \geq 1$);
- $1 \leq a_i \leq 2^n - 1$;
- The array is strictly increasing ($a_i < a_{i+1}$, for each $i \leq m - 1$);
- There are no three consecutive elements with their bitwise XOR equal to zero ($a_i \oplus a_{i+1} \neq a_{i+2}$, for each $i \leq m - 2$. Here $\oplus$ denotes the bitwise XOR operation).

Now, Gew is curious about how many "Eminor" sequences there are. Since there may be a large number of "Eminor" sequences, you only need to output the answer modulo 998 244 353.

Input

The input contains a single integer n ($1 \leq n \leq 10^6$).

Output

Output a single integer, denoting the number of "Eminor" sequences, modulo 998 244 353.

Examples

standard input	standard output
1	1
2	6
3	91

Note

For the second testcase, the following are 6 possible "Eminor" sequences.

- [1]
- [2]
- [3]
- [1, 2]
- [1, 3]
- [2, 3]

Irrelevent: Originating from an incorrect problem reading https://codeforces.com/gym/102956/problem/C XD