

# Graph

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            3 seconds  
Memory limit:         1024 megabytes

We call an undirected graph with  $n$  vertices “good” when for all  $1 \leq u, v \leq n$ , there exists at least one path between  $u, v$ , i.e.,  $u = x_1, x_2, \dots, x_m = v$  such that  $\gcd(u, v) = \gcd(x_1, x_2, \dots, x_m)$ .

We call an undirected graph with  $n$  vertices “perfect” when it is “good” and the number of edges in the graph is minimal. That is to say, any other “good” graph with  $n$  vertices has no less number of edges than this graph.

You need to count the number of “perfect” graphs with  $n$  vertices.

Since the answer could be very large, you only need to find it modulo 998 244 353.

## Input

The input contains only one single integer  $n$  ( $2 \leq n \leq 10^{11}$ ) — the number of vertices in the “perfect” graph you need to count.

## Output

The output contains only one single integer, representing the answer modulo 998 244 353.

## Example

standard input	standard output
4	8