Problem F. Function!

Input file: standard input
Output file: standard output

Define the function

$$f_a(x) = a^x \ (a > 0 \wedge a \neq 1)$$

for all $x \in (-\infty, +\infty)$.

You are asked to calculate the value of

$$\sum_{a=2}^{n} \left(a \sum_{b=a}^{n} \lfloor f_a^{-1}(b) \rfloor \lceil f_b^{-1}(a) \rceil \right)$$

where $f_a^{-1}(x)$ is the inverse function of $f_a(x)$, $\lfloor x \rfloor$ is the largest integer that is less than or equal to x, and $\lceil x \rceil$ is the smallest integer that is greater than or equal to x.

Since the value could be very large, please output the value modulo 998244353.

Input

An integer n ($2 \leq n \leq 10^{12}$) described above.

Output

An integer denotes the value you have calculated modulo 998244353.

Examples

standard input	standard output
2	2
10	236