bincatmod

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

You are given an integer n.

Let s denote the string obtained by concatenating the binary representations of all the integers from 1 to n in order, without leading zeros.

For example, if $n = 6$, then $s = \texttt{11011100101110}$.

Compute $s_{(10)} \bmod 998244353$, where $s_{(10)}$ is the integer represented by viewing s in base 10, i.e, in decimal.

Input

The first line contains t $(1 \le t \le 1000)$, the number of testcases. The second line contains t space-separated integers, each being a value of n $(1 \le n \le 10^{15})$.

Output

For each testcase, output one integer: the value of $s_{(10)} \bmod 998244353$.

In layman's terms, the problem statement asks you to create a long string that is a binary representation concatenation of numbers and then read it as a decimal string and print it modulo 998244353.

Example

standard input	standard output
2	11011
3 7	703895966

Note

For $n = 3$ the binary string is $s = \texttt{11011}$, now if we assume its a decimal string and then print it modulo 998244353, 11011 mod 998244353 = 11011

For $n = 7$ the binary string is $s = \texttt{11011100101110111}$, now if we assume its a decimal string and then print it modulo 998244353, 11011100101110111 mod 998244353 = 703895966