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

Output

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

Example

standard input	standard output
2 3 7	11011 703895966