Formal Fring

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

I don't think we're alike at all, Mr. White. You're not a cautious man at all... [Y]ou have poor judgement. I cannot work with someone with poor judgement.

—Gustavo Fring, *Breaking Bad*

Gus Fring is a very careful man. He doesn't mess with you. When he asks someone to solve a problem, he gives a completely formal statement. And today he asked YOU.

For a positive integer n, define $highest\_bit(n)$ as the largest number i, such that $2^i \le n$. Also define $highest\_bit(0) = -1$.

You are given a positive integer X. Find the number of multisets S of positive integers, which satisfy the following conditions:

- All elements of S are nonnegative powers of 2.
- The sum of elements of S is X.
- There is no way to split elements of S into two groups so that $highest\_bit(S_1) = highest\_bit(S_2)$, where S_1 is the sum of the elements in the first group, and S_2 is the sum of the elements in the second group.

Solve this problem for $X = 1, 2, \ldots, n$.

Since the answers can be very large, output them modulo 998244353.

Input

The only line of the input contains a single integer n ($1 \le n \le 10^6$).

Output

Output n integers: answers to the problem for $X = 1, 2, \ldots, n$, modulo 998244353.

Example

standard input	standard output
`10`	`1 1 2 1 1 3 6 1 1 2`