Consider we have a permutation p of length n.
Lets define $parts(p)$ as minimum size of a subset of $\{1, 2, 3, ..., n\}$ like s that for all i $(1 \leq i \leq n)$, at least one of i or p_i or p_{p_i} or ... are in s.
For example $parts(1, 2, 3) = 3$ and $parts(2, 1, 3) = 2$.
You are given n, for all i $(1 \leq i \leq n)$ find number of permutations like p that $parts(p) = i$ modular 998244353.

Input

The only line of input contains an integer n.
$1 \leq n \leq 5 \times 10^5$

Output

Print a single line n space separated integers the answer of problem.