Huge Segment Tree

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

An interval of integers is considerd *segment-tree-like* if the following condition holds:

- The interval that can be expressed as $[2^i j, 2^i(j+1))$ $(0 \leq i \leq K, 0 \leq j < 2^{K-i})$ with some integers i, j.

For a pair of integer (l, r) that satisfy $0 \leq l < r \leq 2^K$, it can be proven that it is possible to express the interval $[l, r)$ as the union of segment-tree-like intervals. We denote the minimum numbers of intervals required as $f(l, r)$.

For $k = 1, 2, \ldots, 2K-2$, solve the following problem:

- Find the numbers of pairs of integers (l, r) $(0 \leq l < r \leq 2^K)$ such that $f(l, r) = k$, modulo 998244353.

Input

The input is given from Standard Input in the following format:

K

- K is an integer.
- $2 \leq K \leq 5 \times 10^5$

Output

Print the answer to the problem when $k = 1, 2, \ldots, 2K-2$ in this order.

Examples

standard input	standard output
3	15 14 6 1
5	63 110 132 114 70 30 8 1
10	2047 4975 10896 21772 38360 58724 77184 86312 81448 64324 42112 22576 9744 3304 848 155 18 1

Note

In the first example, when $k = 4$, $f(l, r) = k$ holds only when $l = 1, r = 7$, so 1 is the output.