Problem J. The Mysterious Shop

Input file: standard input
Output file: standard output

There is a mysterious shop outside the Valoran continent. No one knows who operates it, but at the very beginning of every day, the items in the shop are regenerated uniformly and randomly: the shop contains items with weights $1, 2, \ldots, n$. For each weight, there is a probability of $\frac{1}{2}$ that exactly one item of that weight will be in the shop; otherwise, there will be exactly zero items of that weight — in which case, even if an item was present the previous day, it will mysteriously disappear.

Kevin, as a newcomer, is ready to make a big impact here, but first, he needs to buy good equipment. Kevin decides to take a pocket with a capacity of weight n to the mysterious shop every day to be the first customer. He employs the following strategy: examine the items in the shop from heaviest to lightest. For each item, if it fits into the pocket, i.e., the sum of the weights will not exceed n, he adds it to his collection, continuing to the next item until all have been considered. Due to the peculiar payment method in Valoran, it can be assumed that Kevin can always afford to buy all the items he puts into the pocket.

After several days of purchasing, Kevin notices that his daily haul varies. He wants to know whether he is having good or bad luck each day, so he asks you to calculate the possibility that he takes items of total weight i in a day for each possible i.

Input

Input contains an integer n ($1 \le n \le 2 \times 10^5$) in a line, denoting the maximum weight of the items as well as Kevin's pocket.

Output

Print $n + 1$ integers in a line. The i-th integer contains the probability that Kevin takes items of total weight $i - 1$ in a day, multiplied by 2^n, and then taken modulo 998244353. It can be proved that the results before taking modulo are integers.

Examples

standard input	standard output
1	1 1
2	1 1 2
3	1 1 1 5
10	1 1 1 2 2 3 5 13 45 180 771

Note

For the second sample test, there are below four possibilities.

- $\{\}$: Take $\{\}$. The total weight is 0.
- $\{1\}$: Take $\{1\}$. The total weight is 1.
- $\{2\}$: Take $\{2\}$. The total weight is 2.
- $\{1, 2\}$: Take $\{2\}$. The total weight is 2.

The probabilities are $\frac{1}{4}, \frac{1}{4}, \frac{1}{2}$. After multiplying $2^n = 4$, the output should be $1, 1, 2 \pmod{998244353}$.

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