Problem G. Graph Counting

Input file:	*standard input*
Output file:	*standard output*
Time limit:	5 seconds
Memory limit:	256 mebibytes

Consider undirected graphs on $2n$ vertices with no loops and no multiple edges. We will say that a graph G is **good** if there is no perfect matching in G, but for any edge not in G, if we add it to G, the resulting graph will have a perfect matching.

Your goal is to calculate the number of different good graphs on $2n$ vertices modulo 998 244 353.

Two graphs are different if they are non-isomorphic, meaning that one graph can not be transformed into another by relabeling the vertices.

Input

The first line of the input contains one integer n ($1 \le n \le 500\,000$). Recall that $2n$ is the number of vertices in graph.

Output

Print one integer: the number of different good graphs on $2n$ vertices modulo 998 244 353.

Examples

standard input	standard output
2	2
353535	331835697

Note

Graphs for $2n = 4$: