

Numerous Elimination

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

A tournament is held with N players numbered $1, 2, \dots, N$.

There are N queues labeled $0, 1, \dots, N - 1$ at the venue, and a player standing in queue i ($0 \leq i \leq N - 1$) indicates that they have won i consecutive matches at that time.

At the start of the tournament, players are lined up in queue 0 in order of players $1, 2, \dots, N$.

The tournament determines the rank of each player according to the following procedure:

1. When there is exactly one player standing in each queue, the rank of the player in queue i is $N - i$. In this case, the procedure ends.
2. Among the queues with two or more players, select the queue with the smallest number as queue l .
3. The top two players in queue l leave the queue and play a match. The winner of the match joins the back of queue $l + 1$, and the loser joins the back of queue 0.
4. Return to step 1.

Find the number of matches played in this tournament, modulo 998244353.

Assume that there are no ties in the matches, and it can be proven that the answer is unique regardless of the match results.

Input

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

N

- N is an integer.
- $1 \leq N \leq 10^5$

Output

Print the answer.

Examples

standard input	standard output
3	4
5	26
100000	538161387

Note

In the first example, assuming that the player with the smaller number wins the match, the tournament progresses as follows:

Queue 0	Queue 1	Queue 2	Explanation
<u>1, 2</u> , 3			Players 1 and 2 have a match. Player 1 joins Queue 1, and player 2 joins Queue 0.
<u>3, 2</u>	1		Players 3 and 2 have a match. Player 2 joins Queue 1, and player 3 joins Queue 0.
3	<u>1, 2</u>		Players 1 and 2 have a match. Player 1 joins Queue 2, and player 2 joins Queue 0.
<u>3, 2</u>		1	Players 3 and 2 have a match. Player 2 joins Queue 1, and player 3 joins Queue 0.
3	2	1	Since there is exactly one player in each queue, the tournament ends.

The tournament consists of 4 matches, so the output is 4.