

C. Sky Full of Stars

time limit per test: 4 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

On one of the planets of Solar system, in Atmosphere University, many students are fans of bingo game.

It is well known that one month on this planet consists of n^2 days, so calendars, represented as square matrix n by n are extremely popular.

Weather conditions are even more unusual. Due to the unique composition of the atmosphere, when interacting with sunlight, every day sky takes one of three colors: blue, green or red.

To play the bingo, you need to observe the sky for one month — after each day, its cell is painted with the color of the sky in that day, that is, blue, green or red.

At the end of the month, students examine the calendar. If at least one row or column contains only cells of one color, that month is called lucky.

Let's call two colorings of calendar different, if at least one cell has different colors in them. It is easy to see that there are $3^{n \cdot n}$ different colorings. How much of them are lucky? Since this number can be quite large, print it modulo 998244353.

Input

The first and only line of input contains a single integer n ($1 \leq n \leq 1000\,000$) — the number of rows and columns in the calendar.

Output

Print one number — number of lucky colorings of the calendar modulo 998244353

Examples

input	Copy
1	
output	Copy
3	

input	Copy
2	
output	Copy
63	

input	Copy
3	
output	Copy
9933	

Note

In the first sample any coloring is lucky, since the only column contains cells of only one color.

In the second sample, there are a lot of lucky colorings, in particular, the following colorings are lucky:

Codeforces Round #493 (Div. 1)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++11 5.1.0

Choose file:

选择文件

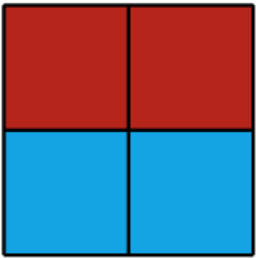
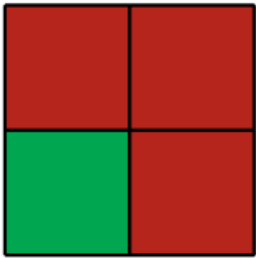
 未选择任何文件

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

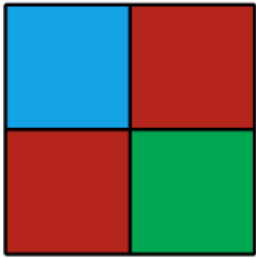
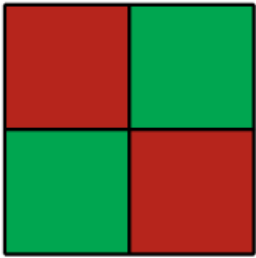
Submit

→ Last submissions

Submission	Time	Verdict
57184288	Jul/17/2019 11:13	Accepted
57184243	Jul/17/2019 11:12	Runtime error on test 16
57183323	Jul/17/2019 10:57	Wrong answer on test 2



While these colorings are not lucky:



→ Problem tags

combinatorics

math

*2600

No tag edit access

→ Contest materials

• Announcement #1 (en)

×

• Announcement #2 (ru)

×

• Tutorial (en)

×

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