Problem A. Welcome to NPCAPC

Time limit: 4 seconds
Memory limit: 1024 megabytes

Among strings of length N consisting of uppercase and lowercase English letters, find the number of strings that contain both 'NPCAPC' and 'npcapc' as subsequences (not necessarily contiguous), modulo 998244353.

You have T test cases to solve.

Constraints

- $1 \le T \le 5000$
- $1 \le N \le 10^9$

Input

The input is given in the following format from standard input:

T

case_1

case_2

$\vdots$

case_T

Here, case_i denotes the i-th test case. Each test case is given in the following format:

N

Output

Output T lines. On the i-th line, output the answer for the i-th test case.

Examples

standard input	standard output
4 12 6 5839 123456	924 0 966252995 432934749
3 123456789 987654321 999999999	333574957 124462731 163251704

Note

For the first sample case:

In the first test case, there are 924 strings that satisfy the conditions, such as 'npcapcNPCAPC' and 'NPCnpcAapPCc'.