

Penguin

2023/2024 SEASON – FOURTH ROUND



After the intense tennis session Vasilena told Deni about her favourite type of sequences – the penguin ones. In order to be a penguin sequence, it has to contain only the Latin letters D and V. Another condition is that when splitting the sequence in subsequences of equal letters (adjacent subsequences consist of different letters), then the subsequences with D have even length, whereas the ones with V – odd length. For instance, DDV, V, VVVDD are penguin sequences, but VDVD is not.

What sparked Deni's interest is how to find the number of penguin sequences of a fixed length N . He knows that you will be able to find it too, so he gives you this task with one more catch – there will be T lengths. Due to the fact that the answer may be too large, you have to output its value modulo $10^9 + 7$.

Input

The first line of the file **penguin.in** consists of one integer T – the number of lengths. Each of the next T lines comprise of one number N – the length of the penguin sequence.

Output

Print T lines in the file **penguin.out** containing one integer – the number of penguin sequences modulo $10^9 + 7$.

Constraints

$$1 \leq N \leq 10^{16}$$

$$1 \leq T \leq 10^4$$

Time limit: 0.9 sec.

Memory limit: 256 MB

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Sample test

Input (penguin.in)	Output (penguin.out)
3	1
2	3
3	6
5	

Sample explanation

The penguin sequences with length 5 are: *VVVDD*, *DDVVV*, *DDDDV*, *VDDDD*, *VVVVV*, *DDVDD*