
Chiaki Sequence

Input file: **standard input**
Output file: **standard output**
Time limit: 5 seconds
Memory limit: 128 megabytes

Chiaki is interested in an infinite sequence a_1, a_2, a_3, \dots , which defined as follows:

$$a_n = \begin{cases} n & n \leq 2 \\ 2 \cdot a_{n-1} & n \text{ is odd} \\ a_{n-1} + r_{n-1} & n \text{ is even} \end{cases}$$

where r_n is the smallest positive integer not in the set $S_n = \{a_j - a_i | 1 \leq i < j \leq n\}$.

Chiaki would like to know the sum of the first n terms of the sequence, i.e. $\sum_{i=1}^n a_i$. As this number may be very large, Chiaki is only interested in its remainder modulo $(10^9 + 7)$.

Input

There are multiple test cases. The first line of input contains an integer T ($1 \leq T \leq 1000$), indicating the number of test cases. For each test case:

The first line contains an integer n ($1 \leq n < 10^{100}$) without leading zeros.

Output

For each test case, output an integer denoting the answer.

Example

standard input	standard output
11	1
1	3
2	7
3	15
4	31
5	52
6	94
7	145
8	247
9	359
10	834069170
1000000000	