# Chiaki Sequence

Chiaki is interested in an infinite sequence $a_1, a_2, a_3, ...$, which defined as follows: $$a_n = \begin{cases} n, & n \le 2 \\ 2 \cdot a_{n-1}, & n \text{ is odd} \\ a_{n-1}+r_{n-1}, & n \text{ is even}\end{cases}$$ where $r_n$ is the smallest positive integer not in the set $S_n = \{a_j - a_i \mid 1 \le i < j \le n\}$.

Chiaki would like to know the sum of the first $n$ terms of the sequence, i.e. $\sum\limits_{i=1}^{n} a_n$. 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 $T$ ($1 \le T \le 1000$), indicating the number of test cases. For each test case:

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

## Output

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

## Example

### Input

```
11
1
2
3
4
5
6
7
8
9
10
1000000000
```

### Output

```
1
3
7
15
31
52
94
145
247
359
834069170
```

## Information

There are $5$ input files and my unoptimized python3 code runs about 1.1 sec per file.