

Square Free Number

A Square free number is a number whose sum of every adjacent two digits is not a perfect square and doesn't contain digit 0. For example, 123 is a square free number cause sum of first two adjacent digits $1 + 2 = 3$ is not a perfect square and sum of last two adjacent digits $2 + 3 = 5$ is not a perfect square.

You are given an integer n . You have to calculate the number of n -digit square free number.

As the result can be very big, output the result modulo $1000000007 (1e9 + 7)$.

Input

First line of the input contains a number T , the number of test cases.

Each of the next T lines will contain an integer n .

Output

Output the number of square free numbers of length n .

Constraints

$T \leq 1000$.

$1 \leq n \leq 10^{18}$.

Example

Input:

```
3
1
2
3
```

Output:

```
6
67
501
```

Note: By definition 1, 4, 9 is not square free number.