Project Euler #113: Non-bouncy numbers

Problem Statement

This problem is a programming version of Problem 113 from projecteuler.net

Working from left-to-right if no digit is exceeded by the digit to its left it is called an increasing number; for example, 134468.

Similarly if no digit is exceeded by the digit to its right it is called a decreasing number; for example, 66420.

We shall call a positive integer that is neither increasing nor decreasing a "bouncy" number; for example, 155349.

As n increases, the proportion of bouncy numbers below n increases such that there are only 12951 numbers below one-million that are not bouncy and only 277032 non-bouncy numbers below 10^{10}.

How many numbers below 10^k are not bouncy?
As the answer can be large, print the result mod $(10^9 + 7)$

Input Format

First line contains an integer T which is the number of tests, next T lines contain an integer k.

Constraints

$1 \leq T \leq 1000$
$3 \leq k \leq 10^5$

Sample Input

```
3
3
5
10
```

Sample Output

```
474
4953
277032
```