

## Problem F

# Fibonacci Lucky Numbers

Time limit: 2 seconds

Memory limit: 2048 megabytes

### Problem Description

Welcome to the **Lucky 777 Slot Game**! This game is known for its complex mathematical challenges, where only the smartest can win the jackpot.

The slot machine is powered by a mysterious sequence—the **Fibonacci sequence**. But it's no ordinary Fibonacci sequence; it has a twist inspired by the number 7, the symbol of luck in slot games.

When you pull the lever of the **Lucky 777 Slot Machine**, it generates a gigantic number using an integer  $n$  and the power of sevens:  $7^{7^n}$ . This number, however, is so massive that even the most powerful computers cannot handle it directly.

To claim the jackpot, you need to compute the last 10 digits of the  $F_{7^{7^n}}$ , the  $7^{7^n}$ -th Fibonacci number.

### Input Format

The first line contains an integer  $t$  indicating the number of test cases. Each of the following  $t$  lines is a test case and contains exactly one positive integer  $n$ .

### Output Format

For each test case, output one line contains the last 10 digits of  $F_{7^{7^n}}$ .

### Technical Specification

- $1 \leq t \leq 20$
- $1 \leq n \leq 10^9$

#### Sample Input 1

```
5
1
2
3
4
5
```

#### Sample Output 1

```
1353646637
3172443437
2364206637
9010523437
9481646637
```

## Note

The Fibonacci sequence is defined as:

- $F_0 = 0$
- $F_1 = 1$
- $F_k = F_{k-1} + F_{k-2}$  for  $k \geq 2$