Recursion: Davis' Staircase



Davis has a number of staircases in his house and he likes to climb each staircase 1, 2, or 3 steps at a time. Being a very precocious child, he wonders how many ways there are to reach the top of the staircase.

Given the respective heights for each of the s staircases in his house, find and print the number of ways he can climb each staircase, module $10^9 + 7$ on a new line.

For example, there is s=1 staircase in the house that is n=5 steps high. Davis can step on the following sequences of steps:

```
11111
1112
1121
1211
2111
122
221
211
313
131
311
23
32
```

There are 13 possible ways he can take these 5 steps. 13%1000000007 = 13

Function Description

Complete the *stepPerms* function in the editor below. It should recursively calculate and return the integer number of ways Davis can climb the staircase, modulo 10000000007.

stepPerms has the following parameter(s):

• n: an integer, the number of stairs in the staircase

Input Format

The first line contains a single integer, s, the number of staircases in his house. Each of the following s lines contains a single integer, n, the height of staircase i.

Constraints

- $1 \le s \le 5$
- $1 \le n \le 36$

Subtasks

• $1 \le n \le 20$ for 50% of the maximum score.

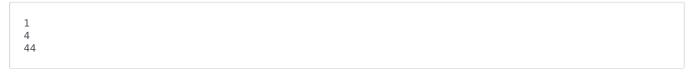
Output Format

For each staircase, return the number of ways Davis can climb it as an integer.

Sample Input

1 3)			
1 1	l			
	L			
-)			
1 3)			
	7			
	/			

Sample Output



Explanation

Let's calculate the number of ways of climbing the first two of the Davis' $\emph{s}=3$ staircases:

- 1. The first staircase only has n=1 step, so there is only one way for him to climb it (i.e., by jumping 1 step). Thus, we print 1 on a new line.
- 2. The second staircase has n=3 steps and he can climb it in any of the four following ways:
 - 1. $1 \rightarrow 1 \rightarrow 1$
 - 2. $1 \rightarrow 2$
 - 3. $\mathbf{2} \rightarrow \mathbf{1}$
 - 4. 3

Thus, we print 4 on a new line.