# Project Euler #106: Special subset sums: meta-testing



#### **Problem Statement**

This problem is a programming version of Problem 106 from projecteuler.net

Let S(A) represent the sum of elements in set A of size n. We shall call it a special sum set if for any two non-empty disjoint subsets, B and C, the following properties are true:

- $S(B) \neq S(C)$ ; that is, sums of subsets cannot be equal.
- ullet If B contains more elements than C then S(B)>S(C).

For this problem we shall assume that a given set contains n strictly increasing elements and it already satisfies the second rule.

Surprisingly, out of the 25 possible subset pairs that can be obtained from a set for which n=4, only 1 of these pairs need to be tested for equality (first rule). Similarly, when n=7, only 70 out of the 966 subset pairs need to be tested.

For a given set size n, how many subset pairs need to be tested for equality?

## **Input Format**

First line contains an integer T denoting the number of test cases. Each of the following T lines contain one integer n - the size of set.

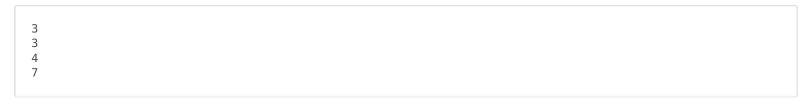
#### **Constraints**

 $\begin{array}{l} 1 \leq T \leq 30 \\ 1 \leq n \leq 10^6 \end{array}$ 

# **Output Format**

For each of T test cases print one line containing a single integer - the number of subset pairs that need to be tested for equality. As this number can be extremely large, output it modulo  $10^9+7$ .

#### Sample Input



### **Sample Output**

0		
1		
70		
70		