homework1. Fibonacci Numbers in O(log n) time

Description

A Fibonacci sequence is calculated by adding the previous two members of the sequence, with the first two members being both 1.

F[1]= 1, F[2] = 1, F[n] = F[n – 1] + F[n – 2] for n>2.

Please calculate F[n] mod 29989(29989 is prime).

Input Format

The first line contains a positive integer $T(1 \leq T \leq 100)$ - the number of test cases.

Each of the next T lines contains a positive integer $n(1 \leq n \leq 10^9)$.

Output Format

For each test case, print F[n] mod 29989 in one line.

Hint

For any integers a and b, (a+b) \mod 29989 = ((a \mod 29989)+b) \mod 29989(a+b)mod29989=((amod29989)+b)mod29989

For any integers a and b, (a*b) \mod 29989 = ((a \mod 29989)*b) \mod 29989(a∗b)mod29989=((amod29989)∗b)mod29989

Sample Input	Sample Output
5 1 3 6 830012704 683536728	1 2 8 29563 16825