

# Project Euler #249: Prime Subset Sums

Let  $S = \{2, 3, 5, \dots\}$  be the set of prime numbers less than  $n$ .

Find the number of subsets of  $S$ , the sum of whose elements is a prime number. Print this number modulo  $10^{16}$ . You should find this number for several values of  $n$ .

## Input Format

The first line of input contains integer  $k$  — number of values of  $n$ .

The second line of input contains  $k$  values of  $n$  separated by spaces.

## Constraints

- $1 \leq k \leq 100$
- $3 \leq n \leq 7000$

## Output Format

Print  $k$  numbers separated by space — your answers in corresponding order.

## Sample Input 0

```
2
10 4
```

## Sample Output 0

```
7 3
```

## Explanation 0

There are four prime numbers under 10: 2, 3, 5 and 7. There are exactly seven ways to choose a subset with prime sum:  $\{2\}$ ,  $\{3\}$ ,  $\{5\}$ ,  $\{7\}$ ,  $\{2, 3\}$ ,  $\{2, 5\}$ ,  $\{2, 3, 5, 7\}$ . Only three of these subset consist of numbers under 4.