

# Project Euler #146: Investigating a Prime Pattern

This problem is a programming version of [Problem 146](#) from [projecteuler.net](#)

The smallest positive integer  $n$  for which the numbers  $n^2 + 1$ ,  $n^2 + 3$ ,  $n^2 + 7$ ,  $n^2 + 9$ ,  $n^2 + 13$ , and  $n^2 + 27$  are consecutive primes is **10**. The sum of all such integers  $n$  below one-million is **1242490**.

What is the sum of all integers  $n$  below  $L$  such that  $n^2 + a_1$ ,  $n^2 + a_2$ ,  $n^2 + a_3$ ,  $n^2 + a_4$ ,  $n^2 + a_5$ ,  $n^2 + a_6$  are consecutive primes?

## Input Format

The first line of input contains  $T$ , the number of test cases.

The first line of each test case contains a single integer,  $L$ . The second line contains six space-separated integers  $a_1, a_2, \dots, a_6$ .

## Constraints

$$1 \leq T \leq 3$$

$$1 \leq L \leq 10^7$$

$$1 \leq a_1 < a_2 < a_3 < a_4 < a_5 < a_6 \leq 40$$

## Output Format

For each test case, output one line containing a single integer, the answer for that test case.

## Sample Input

```
3
10
1 3 7 9 13 27
11
1 3 7 9 13 27
1000000
1 3 7 9 13 27
```

## Sample Output

```
0
10
1242490
```

## Explanation

As mentioned in the problem statement, the first such  $n$  is **10**, so there must be no  $n$ s below **10**. Thus, the answer for the first test case is **0**.

The third test case is mentioned in the problem statement.