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 $a_1, a_2, \ldots, a_6$.

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 ns below 10. Thus, the answer for the first test case is 0.

The third test case is mentioned in the problem statement.