

## Problem : Set of Rectangles

### Problem Description

A Pythagorean triple consists of three positive integers,  $a$ ,  $b$ , and  $c$ , such that  $a^2 + b^2 = c^2$ . Such a triple is commonly written  $(a, b, c)$ . A Pythagorean triple  $(a, b, c)$  can be generated by two integers  $x$  and  $y$  ( $x > y > 0$ ) by setting  $a = 2xy$ ,  $b = x^2 - y^2$ , and  $c = x^2 + y^2$ .

$R = \{R_1, R_2, \dots, R_i, \dots\}$  is a set of rectangles. Let  $w_i$  and  $h_i$  denote the width and height of rectangle  $R_i$ , respectively. Also, let  $d_i$  denote the length of  $R_i$ 's diagonal. A rectangle set  $R$  is called a 'Pythagorean Primitive Rectangle Set' if each rectangle in  $R$  holds following constraints:

1.  $(w_i, h_i, d_i)$  is a Pythagorean triple;

2.  $w_i < h_i$

3.  $\frac{h_i}{w_i} \neq \frac{h_j}{w_j} \quad \text{if} \quad i \neq j$

Bill, a freshman in Pythagoras Memorial High School, got homework in his mathematics class. His homework is described as follows. Given a wire of length  $L$ , he should cut it into pieces and bend each piece of the wire to form a rectangle such that the set of rectangles obtained by the cut pieces should be a Pythagorean Primitive Rectangle Set. Note that a piece of length  $2(w_i + h_i)$  is required to make rectangle  $R_i$ . For example, if rectangle  $R_i$  is represented as a pair of its width and its height,  $(w_i, h_i)$ , and if the total length of the given wire is 94, Bill can cut it into 3 pieces and make a Pythagorean Primitive Rectangle Set,  $R = \{(3,4), (5,12), (8,15)\}$ . With the same wire of length 94, Bill can also make another Pythagorean Primitive Rectangle Set,  $R = \{(3,4), (7,24)\}$  in which case there remains a leftover piece. In other words, Bill does not need to use up all the wire to make a Pythagorean Primitive Rectangle Set.

Given a wire of length  $L$ , Bill wants to make as many rectangles as possible which are the members of a Pythagorean Primitive Rectangle Set. You are asked to make a program to help Bill.

### Input

The input file name is `rectangles.inp`. The input consists of  $T$  test cases. The number of test cases  $T$  is given in the first line of the input. Each test case has a single integer  $L$  ( $14 \leq L \leq 1,000,000$ ), the total length of a wire to be cut into pieces.

### Output

The output file name is `rectangles.out`. Print exactly one line for each test case. The line should show the maximum number of rectangles which can be made by the wire of length  $L$  as described above.

The following shows sample input and output for two test cases.

#### Sample Input

#### Output for the Sample Input

|      |    |
|------|----|
| 2    | 1  |
| 14   | 10 |
| 1000 |    |