

The 2019 Ethiopian Collegiate Programming Contest



Problem H Four Squares Time Limit: 0.5 Seconds

It was proven by Lagrange in 1770 that every natural number can be represented as the sum of four or fewer squares. Some numbers are represented in multiple ways. For example, 26 is the sum of 5^2 and 1^2 ; it can also be represented as $4^2 + 3^2 + 1^2$. Expressing a number as the sum of four or fewer squares is historically a common problem posed to lightning calculators. It was reported in the early 1900s that a calculator produced a solution of $15663 = 125^2 + 6^2 + 1^2 + 1^2$ in 8 seconds. A more difficult problem took 56 seconds: $11339 = 105^2 + 15^2 + 8^2 + 5^2$.

Given a natural number n , write a program to express n as the sum of as few squares as possible.

Input

Your program is to read from standard input. The input consists of a single line containing a natural number n , where $1 \leq n \leq 50,000$.

Output

Your program is to write to standard output. Print exactly one line which contains the minimum number of squares whose sum is equal to n .

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

Sample Input 1	Output for the Sample Input 1
25	1
Sample Input 2	Output for the Sample Input 2
26	2
Sample Input 3	Output for the Sample Input 3
11339	3
Sample Input 4	Output for the Sample Input 4
34567	4