Closest square number

A *square number* is an integer number that can be represented in a form of a square of the other integer number. For example, number 25 is a square number because $25 = 5^2$. In a contrary, number 18 is not a square number because there is no integer number k for which $k^2 = 18$.

You are asked to find the closest square number for a given integer number. The distance between two numbers n and m is defined by the absolute value of their difference, i.e. $dist(n,m) = |n - m|$.

Input

The first line of the input consist of a single integer number t which determines the number of tests.

In each of next t lines there is a single integer number n.

Constraints

- $0 < t \leq 1000$
- $0 < n \leq 50\,000\,000$

Output

For each number n print its closest square number. Separate your answers with a new line character.

Example

Input:
4
11
23
99
101

Output:
9
25
100
100