Problem F: Next Square

Filename: `nextsquare`

Time limit: `1 second`

Math and Programming Contest enthusiasts have been excited about this upcoming contest year, 2025, since 2025 is a perfect square! This lends itself to all sorts of neat problems. Unfortunately, if someone is born in 2026, they will have to wait 90 years, until 2116, for the next time the year is a perfect square, since $46^2 = 2116$.

This has you wondering, depending on what year someone is born in, just how long would they have to wait until they experience their first year that is a perfect square.

Problem
Given the year a person is born, determine the number of years they have to wait until the year is a perfect square.

Input
The first line of input contains a single positive integer, **c**, representing the number of input cases. The input cases follow, one per line. Each of these lines contains a single positive integer, **n**, the year the person was born.

Output
For each input case, output a single non-negative integer, representing the number of years a person born in the given year will have to wait until there is a year that is a perfect square.

Input Bounds and Corresponding Credit

30 Points	70 Points
$1 \le c \le 1000$ $1 \le n \le 10^9$	$1 \le c \le 10000$ $1 \le n \le 10^{18}$

Samples

Input	Output
2 2025 2026	0 90