Problem 5—Number of Admissible Paths

Professor Plum likes to vacation in big cities because he can relate to the "squareness" of the city blocks. The city blocks remind him of a two-dimensional lattice.

Let's call a lattice point (x, y) *inadmissible* if x, y and $x + y$ are all positive perfect squares.
For example, (9, 16) is inadmissible, while (0, 4), (3, 1) and (9, 4) are not.

Consider a path from point (x_1, y_1) to point (x_2, y_2) using only unit steps north or east.
Let's call such a path *admissible* if none of its intermediate points are inadmissible.

Let P(n) be the number of admissible paths from (0, 0) to (n, n).
It can be verified that P(3) = 20, P(5) = 252, and P(16) = 596994440.

INPUT SPECIFICATION

The input contains a single line with a positive integer n. The resulting P(n) value will fit in a 64-bit integer representation.

OUTPUT SPECIFICATION

The output should contain a single line with the number of admissible paths from (0, 0) to (n, n).

SAMPLE INPUT

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16
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SAMPLE OUTPUT

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596994440
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