Project Euler #66: Diophantine equation

Consider quadratic Diophantine equations of the form:

$$x^2 - Dy^2 = 1$$

For example, when $D = 13$, the minimal solution in x is $649^2 - 13 \times 180^2 = 1$. It can be assumed that there are no solutions in positive integers when D is square.

By finding minimal solutions in x for $D = 2, 3, 5, 6, 7$, we obtain the following:

$$3^2 - 2 \times 2^2 = 1$$
$$2^2 - 3 \times 1^2 = 1$$
$$9^2 - 5 \times 4^2 = 1$$
$$5^2 - 6 \times 2^2 = 1$$
$$8^2 - 7 \times 3^2 = 1$$

Hence, by considering minimal solutions in x for $D \leq 7$, the largest x is obtained when $D = 5$.

Find the value of $D \leq N$ in minimal solutions of x for which the largest value of x is obtained.

Input Format

Input contains an integer N.

Constraints
$7 \leq N \leq 10^4$

Output Format

Print the answer corresponding to the test case.

Sample Input

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7
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Sample Output

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5
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Explanation

Explained in statement.