Problem K. Number Theory

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	256 mebibytes

You are given a prime p.

For integer x, such that $0 \le x < p$ let's call $f(x)$ the minimum non-negative integer a, such that there exists b, such that $(a^2 + b^2) \mod p = x$.

Your goal is to find $\max(f(0), f(1), \ldots, f(p-1))$.

It can be proved that for each prime p and each integer x you can find at least one pair a, b such that $(a^2 + b^2) \mod p = x \mod p$.

Input

The first line of input contains one integer p ($2 \le p \le 10^5$).

It is guaranteed that p is prime.

Output

Print one integer: $\max(f(0), f(1), \ldots, f(p-1))$.

Examples

standard input	standard output
2	0
3	1
5	2
7	2
99991	20