



E: Eratosthenes Error

Time Limit: 1 second(s)

Over the Easter break, Chouchou was taught everything there is to know about prime numbers. To remind you, a prime number is a positive integer greater than 1 that has exactly two positive divisors: 1 and itself.¹ One of the most interesting things that Chouchou learned was how to generate the prime numbers. There are many algorithms that can do this, but the one he was most interested in was the Sieve of Eratosthenes.

The Sieve of Eratosthenes is a brilliantly easy idea:

- Begin with an array `isPrime`, initially set to all `true`.
- Looping from $i = 2$ to $i = n$, if `isPrime[i]` is `true`, then set `isPrime[i*j]` to `false` for all $j \geq i$.

In layman's terms, if i is a prime, then eliminate every multiple of i (since it is a multiple of i , it must not be prime). Note that we can start at $j \geq i$ instead of $j \geq 2$, but we will leave that as an exercise for you to figure out why. Here is some (correct) code that fills `isPrime` up to $8 \cdot 10^{18}$.

Correct Code:

```
n = 8000000000000000000; // Trust me, there are 18 zeroes
for ( i=1 ; i<=n ; i += 1 )
    isPrime[i] = 1;
isPrime[1] = 0;
for ( i=2 ; i<=n ; i += 1 )
    if ( isPrime[i] )
        for ( j=i*i ; j<=n ; j += i )
            isPrime[j] = 0;
```

Unfortunately, when Chouchou typed up the algorithm, he made a small typo in the last `for`-loop.

Chouchou's Incorrect Code:

```
n = 8000000000000000000; // Trust me, there are 18 zeroes
for ( i=1 ; i<=n ; i += 1 )
    isPrime[i] = 1;
isPrime[1] = 0;
for ( i=2 ; i<=n ; i += 1 )
    if ( isPrime[i] )
        for ( j=i*i ; j<=n ; j += i*i )
            isPrime[j] = 0;
```

After Chouchou's program finishes, what is the value of `isPrime[k]`? In case you are wondering, Chouchou's computer is *very* fast and can handle the 8 exabytes ($8 \cdot 10^{18}$ bytes) of memory required to store the `isPrime` array.

¹Some people are confused about if 1 is a prime number. To answer the question for you: No, 1 is *not* a prime number. 1 is called a *unit* and by definition, units cannot be prime numbers.

Input

The input will contain a single integer k ($1 \leq k \leq 8 \cdot 10^{18}$).

Output

Output the value of `isPrime[k]` in Chouchou's incorrect code on the previous page.

Sample Input and Output

Sample Input	Output for Sample Input
3	1

Sample Input	Output for Sample Input
6	1

Sample Input	Output for Sample Input
36	0