Problem 10: PrimeBuzz

(Hard)

Have you heard of the FizzBuzz game? In the game, players take turns to count incrementally, replacing any number divisible by 3 with the word `FIZZ`, and any number divisible by 5 with the word `BUZZ`.

That game seems *a little too easy*.

Introducing *PrimeBuzz*! It is like FizzBuzz, except that you should replace any *prime number* with the word `PRIME` and any number *which is a palindrome* with the word `BUZZ`. Replace any number which matches both of those rules with `PRIMEBUZZ`.

(Note: a palindrome is a number which reads the same forwards and backwards. Some examples are `1`, `121`, `12321`, `123321` and `11234343211`)

Here are the first few rounds of PrimeBuzz:

Actual Number	What is Said
1	BUZZ
2	PRIMEBUZZ
3	PRIMEBUZZ
4	BUZZ
5	PRIMEBUZZ
6	BUZZ
7	PRIMEBUZZ
8	BUZZ
9	BUZZ
10	10
11	PRIMEBUZZ
12	12
13	PRIME
14	14
15	15
16	16
17	PRIME
18	18
19	PRIME
20	20
21	21
22	BUZZ

Actual Number	What is Said
23	PRIME
24	24
25	25

The above game of PrimeBuzz was played with a *Round Total*, R, of `25`, which is the maximum number of rounds to play PrimeBuzz before stopping.

Seeing this *wonderful and fun game*, you wanted to join in the fun. Having gotten your own Round Total (your puzzle input), you are able to play PrimeBuzz yourself. To check that you are playing the game correctly, perform the following operations:

- Play PrimeBuzz with your given Round Total, R.
- Count the number of instances of `PRIME`. Let this value be P.
- Count the number of instances of `BUZZ`. Let this value be B.
- Count the number of instances of `PRIMEBUZZ`. Let this value be Z.
- Compute $K = P \times B \times Z$.

For example, the above game of PrimeBuzz has $P = 4$, $B = 6$, and $Z = 5$. Thus, $K = 4 \times 6 \times 5 = 120$.

Play PrimeBuzz with your given Round Total R. What will your K be?

Input Format

The only line of input will contain the *Round Total* R.

Constraints

$1 \leq R \leq 10^7$.

Output Format

The only line of output should contain the value of K.

Sample Input

```
25
```

Sample Output

```
120
```