The sequence of $n-1$ consecutive composite numbers (positive integers that are not prime and not equal to 1) lying between two successive prime numbers p and $p+n$ is called a *prime gap* of length n. For example, $\langle 24, 25, 26, 27, 28 \rangle$ between 23 and 29 is a prime gap of length 6.

Your mission is to write a program to calculate, for a given positive integer k, the length of the prime gap that contains k. For convenience, the length is considered 0 in case no prime gap contains k.

Input

The input is a sequence of lines each of which contains a single positive integer. Each positive integer is greater than 1 and less than or equal to the 100000th prime number, which is 1299709. The end of the input is indicated by a line containing a single zero.

Output

The output should be composed of lines each of which contains a single non-negative integer. It is the length of the prime gap that contains the corresponding positive integer in the input if it is a composite number, or '0' otherwise. No other characters should occur in the output.

Sample Input

```
10
11
27
2
492170
0
```

Sample Output

```
4
0
6
0
114
```