

## Problem 4—Twin Primes

Bender and Flexo are twins on a prime time television program, so it's kind of like they're twin primes. Get it? Twin pr—never mind.

Twin primes are prime numbers that differ by exactly two. Like 5 and 7 or like 17 and 19, but not like 1 and 3, since 1 is not prime.

Given two positive integers, you are to compute the number of twin prime pairs occurring (inclusively) between the two given integers. Both of the primes in the pair must be within the given range.

**INPUT SPECIFICATION.** Each input case will consist of two unsigned decimal integers,  $a$  and  $b$ , separated by one space, with  $a < b$ . An **<EOLN>** follows each input case. “0 0**<EOLN>**” follows the last case and is not processed.

**OUTPUT SPECIFICATION.** The output cases appear in the same order as their corresponding input cases. Each output case is of the form “Case  $c$ : There are  $p$  pairs of twin primes between  $a$  and  $b$ .” followed by **<EOLN>**, where  $c$  is the case number, and  $p$  is the answer. An extra **<EOLN>** follows each output case.

### SAMPLE INPUT.

```
1 10<EOLN>
90 100<EOLN>
0 0<EOLN>
<EOF>
```

### SAMPLE OUTPUT.

```
Case 1: There are 2 pairs of twin primes between 1 and 10.<EOLN>
<EOLN>
Case 2: There are 0 pairs of twin primes between 90 and 100.<EOLN>
<EOLN>
<EOF>
```