1 Problem

The prime 41, can be written as the sum of six consecutive primes:

$$41 = 2 + 3 + 5 + 7 + 11 + 13 \tag{1}$$

This is the longest sum of consecutive primes that adds to a prime below one-hundred.

The longest sum of consecutive primes below one-thousand that adds to a prime, contains 21 terms, and is equal to 953.

Which prime, below one-million, can be written as the sum of the most consecutive primes?

2 Solution

```
import Data.List
import qualified Data.Map as Map
import Data.Maybe
import System.Environment
import Data.Numbers
import Data.Numbers.Primes

sPrimes = takeWhile (<4000) primes

bLongSeqPrimes pr =
  let seqs = [take l (drop k pr) | k <- [0..(length pr - 1)], l <- [0..(length pr - 1)]]
      lens = map (\z -> (length z, sum z)) $ filter (\z -> (sum z < 1000000) && (isPrime $ sum z)) seqs
  in lens

buildr :: (a -> [b] -> [b]) -> [a] -> [b] -> [b]
buildr f [] sd = sd
buildr f (x:xs) sd = buildr f xs (f x sd)

main = do
  let soln = maximumBy (\x y -> compare (fst x) (fst y)) (bLongSeqPrimes sPrimes)
  putStrLn $ "The prime (< 10^6) which can be written as the sum of\n"
    ++ "the most consecutive primes is " ++ show (snd soln) ++ "."
```

3 Result

```
runhaskell problem50.lhs
The prime (< 10^6) which can be written as the sum of
the most consecutive primes is 997651.
```