Concurrent ML

Exercise 1: An Infinite Version of the Sieve of Eratosthenes

1   Goal

Without using SML/NJ's lazy extension (Chapter 15 of Harper), implement an infinite version of the Sieve of Eratosthenes. You should define the following type function and values:

```
type 'a stream
val split : 'a stream * int -> 'a list * 'a stream
val primes : int stream
```

where:

- `'a stream` is the type of infinite lists of values of type `'a`;

- `split`(xs, n) returns the pair (us, vs), where us is the first n elements of xs, and vs is the remaining elements of xs; and

- `primes` consists of all of the prime numbers, listed in ascending order.

You should use references (Chapter 13 of Harper), in such a way that computation is delayed as long as possible, and values are memoized, i.e., so that your program is lazy.

2   Submission

Bring a copy of your program, or as much of it as you are able to write, to Wednesday afternoon's exercise session, and also make it available on the WWW. Be prepared to talk about your solution during the exercise session.