SAMFYB / **FP-150-Notebook**

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1 contributor

75 lines (55 sloc) 3.62 KB

Recitation April 4 - Sequences

List v. Sequences (Pros & Cons)

Pros:

- constant time access
- parallelism

Cons:

- no cons!
- take more memory
- no pattern matching

Sequence Library

- Seq.tabulate
- Seq.map
- Seq.filter
- Seq.nth
- Seq.reduce

Tabulate

```
Seq.tabulate : (int -> 'a) -> int -> 'a seq
(* < 0, 1, 2 > = *) Seq.tabulate (fn x => x) 3
```

Reverse Sequence

```
fun rev S =
  Seq.tabulate (fn i => Seq.nth S (Seq.length - i - 1)) (Seq.length S)
```

Eliminate Rows of Sequence of Sequences

```
fun elimRows (L : int Seq.seq Seq.seq) (k : int) =
  let
    val Smax = Seq.map (fn S => (Seq.reduce Int.max 0 S, S)) L
    val filtered = Seq.filter (fn (m, R) => m > k) Smax
    val remove = Seq.map (fn (m, R) => R) filtered
  in
    remove
  end

(* elimRows removes rows where there is NO element greater than k *)
```

Work & Span Analysis of Sequence Library

Function	Work	Span
tabulate	$O(n)$	$O(1)$
map	$O(n)$	$O(1)$
filter	$O(n)$	$O(log(n))$
nth	$O(1)$	$O(1)$
reduce	$O(n)$	$O(log(n))$
length	$O(1)$	$O(1)$