

Week 11 - Day 1 (Finishing streams & Carets)

Mar 31, 2016

Where we left off...

We were working on getting a stream of convergences to pi

```
(define (let s)
  (define s0 (scar s))
  (define s1 (scar (scdr s))))
  (define s2 (scar (scdr (scdr s)))))
  (define denominator (+ s0 (* -2 s1) s2))
  (scons
    (- s2 (/ (^ (- s2 s1) 2) denominator ))
    (et (scdr s)))
  )
)

;@ Audio 0:03:14
(define (tableau xform s) (scons s (tableau (xform s))))
```

Audio 0:04:00

The state of the world is not being saved...

Audio 0:05:12

The tableau applies the stream an extra time after each transform

```
(print "2 xform: ")
(sdisplay (sscale (et (et (psum pi-stream))) 4) 10)
;@ Audio 0:06;54
```

Audio 0:07:30 A map function for streams

```
(define (smap f s) (scons (f (scar s)) (smash f (scdr s))))
```

Audio 0:08:50

```
(sdisplay (sscale (smash scar (tableau et (psum pi-stream))) 4) 10)
```

Audio 0:16:00

```
for (i = 0; i < infinity; i++) {
    for (j = 0; j <= i; j++) {
        print("(%d,%d)", j, i)
    }
}
```

Creates the stream of pairs: (0,0),(0,1)(1,1)(0,2)(1,2)(2,2)

Which are pairs s.t. $i \leq j$

Audio 0:19:43

```
(define (pairs s t)
```

Breaking it up into:

(0,0) (0,1) (0,2) (0,3) (0,4)

(1,1) (1,2) (1,3) (1,4)

(2,2) (2,3) (2,4)

Audio 0:22:00

```
(pairs (0 1 2 ...) (0 1 2 ...)....
```

```
(define (pairs s t)
  (scons
    ;@ This only takes care of the (0,0)
    (list (scar s) (scar t))
    (smash (lambda (x) (list (scar s) x)))
```

```
(scdr t))  
;@ Audio 0:27:00  
(pairs (scdr s) (scdr t))
```

Do the Lusth Shuffle

Audio 0:31:10

```
;@ You have  
;@ a b c d e ... and  
;@ A B C D E  
;@      v  
;@      v  
;@ a A b B c C d D e E ...  
(define (shuffle s t)  
  (scons  
    (scar s)  
    (shuffle t (scdr s)))  
  )  
)
```

```
(define (pairs s t)  
  (scons  
    ;@ This only takes care of the (0,0)  
    (list (scar s) (scar t))  
    (shuffle  
      (smap (lambda (x) (list (scar s) x))  
            (scdr t))  
      ;@ Audio 0:27:00  
      (pairs (scdr s) (scdr t)))  
    ))
```

Audio 0:35:00 Caret dog ayyyy lmao

Caret dog world changes over time

Streams, on the other hand, look like they change, but they don't



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jmbeach1@crimson.ua.edu

 jmbeach

Website for notes and study material for
CS 403 (Programming Languages) at The
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