Today

- Review of List stuff
- Generalized Lists
- Deep-add

**list**
- Takes any number of arguments and puts them in a list

**cons**
- Takes two arguments
- Makes the first arg the car of the new list
- Makes the second arg the cdr of the new list
- The second argument MUST be a list

**append**
- Takes one or many lists and turns them into one
- all arguments MUST be lists

**car and cdr**

\[
\text{car (cdr (car (car L)))}
\]

\[
\text{(cadaar L)}
\]

\[
\text{(cddaadr L)}
\]

\[
\text{(cdr (cdr (car (car (cdr L)))))}
\]
Generalized Lists

(deep-add '1 (2 3) ((4) 5))
(+ 1 (deep-add '((2 3) (4) 5)))
(+ 1 (+ (deep-add '(2 3)) (deep-add '(4) 5)))
(+ 1 (+ (+ 2 (deep-add '3)) (deep-add '(4) 5)))
(+ 1 (+ (+ 2 (+ 3 (deep-add '))) (deep-add '(4) 5)))
(+ 1 (+ (+ 2 (+ 3 0)) (deep-add '(4) 5)))
  ((null? L) 0)
  ((number? (car L))
    (+ (car L) (deep-add (cdr L)))
  )
  (else
   (+ (deep-add (car L))
     (deep-add (cdr L)))))

deep-add

(define (deep-add L)
  (cond
    ((null? L) 0)
    ((number? (car L))
     (+ (car L) (deep-add (cdr L))))
    (else
     (+ (deep-add (car L))
        (deep-add (cdr L))))))