

# Week 8 - Day 1 (Environments and Conventional Interfaces)

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1:49 PM

Week 8 - Day 1 <sup>Promotion & Environments</sup> CS403-001 Jared Beach

Sieve of Eratosthenes Conventional Interface

(2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17  
18 19 20 21 22 23 24)

2  $\Rightarrow$  (2 3 4 5 6 ...)

3  $\Rightarrow$  (2 3 4 5 6 ... 9 ...)

remaining are primes

Data-directed Programming

- Store functions which combine numbers in a lookup table and get back the right

$n$  types of numbers  
 $\Theta(n^2)$  ~~other~~ functions

For programs like Java & C++, you have 2 types of numbers:

- Int & real

There could be 4 different multiply operations

*	int	int
*	real	real
*	real	int
*	int	real

◦ COMPLEX  
◦ REAL  
◦ RATIONAL  
◦ BIG INTS  
◦ INTEGERS

Promotion  
less complex, to more complex data conversion  
need at least 4 promotion functions for





the winter dry

 $\frac{2}{4}$ 

## Lookup table structure

[illegible]

# Environments

Just a table  
stores identifiers and values (binding)  
In C there is the local & global scope

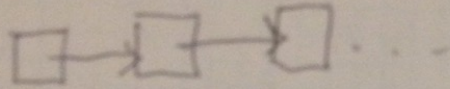
\* In C there is the local & global scope

Need a way to distinguish

$\Sigma$  int y = 0 ← different  
if (...)  $\Sigma$   
int y = 1 ←



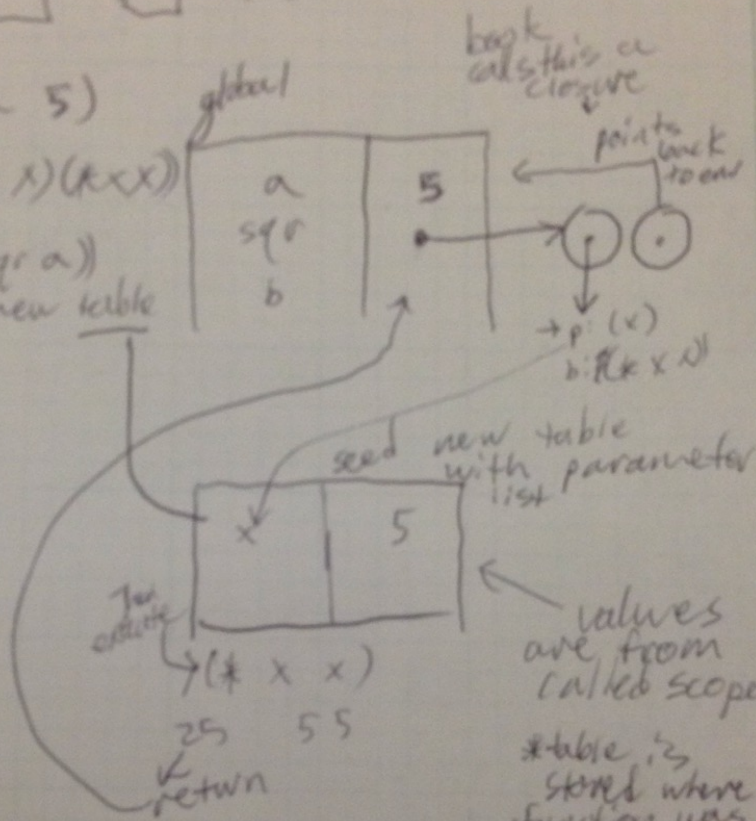
Environments can be represented as a linked list of tables



(define a 5)

(define (sqr x) (x x))

(define b (sqr a))  
Need a new table



(define a 4)

(define (fact n) (if (or n 1) 1 (\* n (fact (- n 1)))))

(define b (fact a))

