



# COM S 342

Recitation 11/4/2019 –  
11/6/2019

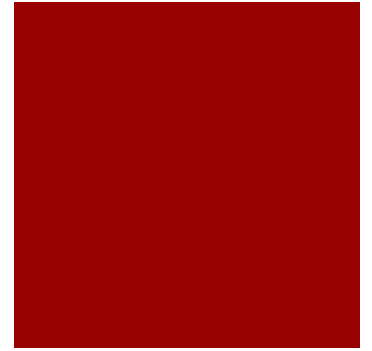
Topic

○Reflang Programming

○Q&A



# Reflang



- We add extensions to our language to support side effects
- These extensions focus on reading and writing memory locations
- We need two concepts and definitions:
  - Heap: memory reserved for dynamic alloc
  - References: locations in the heap

# Reflang-Reference



- (ref 1): stores the value 1 in a fresh location
  - (free (ref 1)): deallocate the location for (ref 1)
  - (deref (ref 1)): dereference a previously allocated memory location
- \$(define loc (ref 3))
- \$(deref loc)
- \$3
- \$ (free loc)
- \$ (deref loc)
- \$Error: null

# Reflang-Reference



○(set! loc v): mutates the value of location loc, assigning value v

-(define loc (ref 3))

-(deref loc)

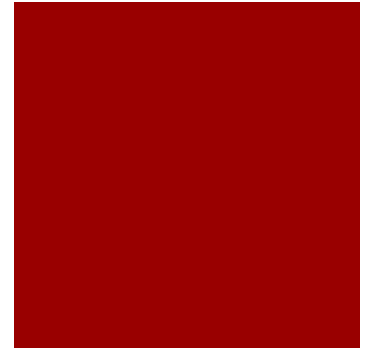
-\$3

-(set! loc 10)

-(deref loc)

-\$10

# Reflang-Exercises



```
$(define l1 (ref 3))
$(define l2 (ref 42))
$l1
$??
$l2
$??
$(free l2)
$l2
$??
$(deref l2)
$??
$(set! l2 20)
$20
$(deref l2)
$??
$((define l2 (ref 30)))
$l2
$??
```

# Reflang-Exercises



```
$(define 11 (ref 3))
$(define 12 (ref 42))
$11
$loc:0
$12
$loc:1
$(free 12)
$12
$loc:1
$(deref 12)
$Error:null
$(set! 12 20)
$20
$(deref 12)
$20
$((define 12 (ref 30)))
$12
$loc 2
```

Q&A

