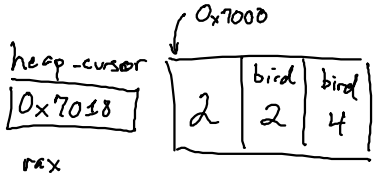
Eagle

Heap allocation:

- C malloc to get heap memory
- use heap_cursor to track of allocation
- assume linear usage: all allocated memory is below cursor; all unallocated is above

(2,4)



16 1

0x18 = 24

(2, 4, 7, false)

rax
0x7001

0111 0000 0001 1001

I am a pointer

"Functional language"

List.map (fun n→n+1) — anonymous

- First-class function: functions are values
- Partial application: functions can be provided some arguments without others
- Anonymous functions: functions can be written using a literal syntax

	OCaml	Python	C++	Javascript	Haskell	C	Rust	Falcon
first-class functions	✓	✓	11?	✓	✓	X	✓	✓
partial application	✓	X	X	X	✓	X	X	✓
anonymous functions	✓	✓*	11?	✓	✓	X	✓	X

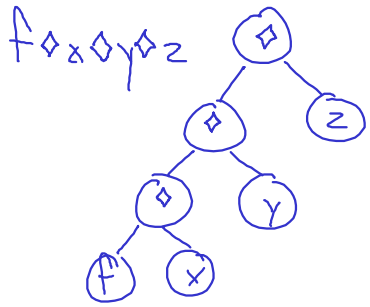
* lambda n:int1

① Syntax

<expr> ::= .... (Cardinal + Eagle tuples)
| <expr> <expr>

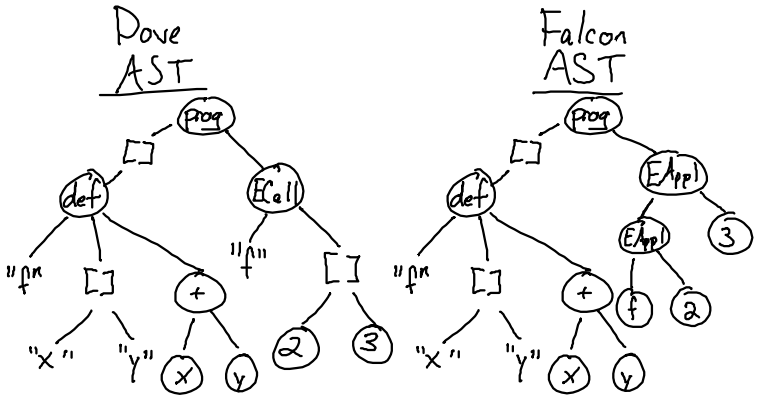
<decl> ::= def <ident> <param_list> = <expr> end

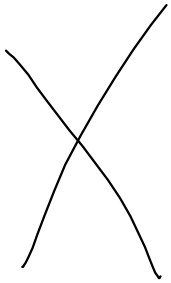
<param_list> ::= <param>
| <param> <param_list>



② Semantics

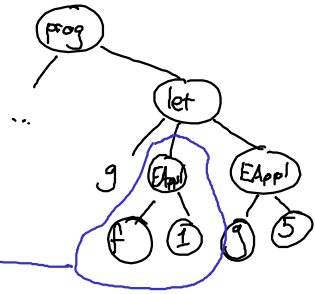
Dove	Falcon	Evaluation
def f(x,y) x+y end f(2,3)	def f x y = x+y end (f 2)3	5





```
def f x y =
  x+y
end
let g = f 1 in
g 5
```

6



func = f
first arg = 1
params for fn = 2
args = 1

Store pointer to closure