Fb Syntax

Concrete Syntax

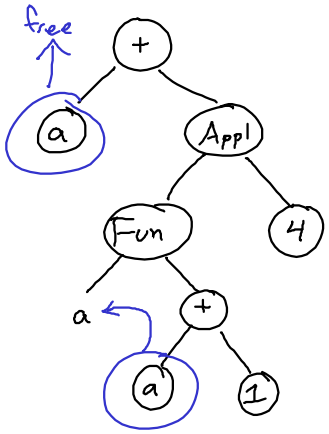
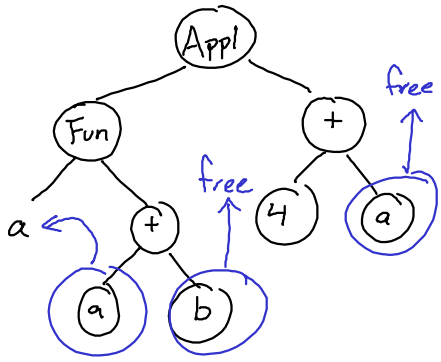
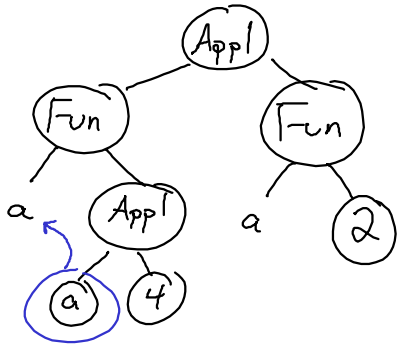
f (-5)

v ::= True | False | ▨ | Function x -> e | x

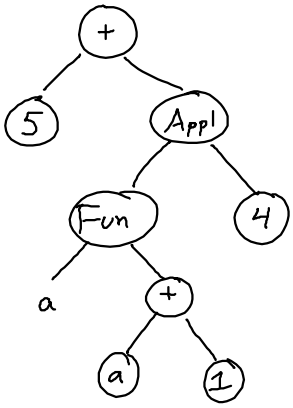
e ::= v | e + e | e - e | e = e | Not e | e Or e | e And e | If e Then e Else e | e e | (e) |
Let x = e In e | Let Rec f x = e In e

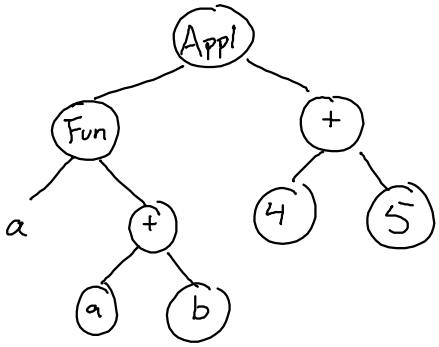
```
def fn(x):
    return 4
```

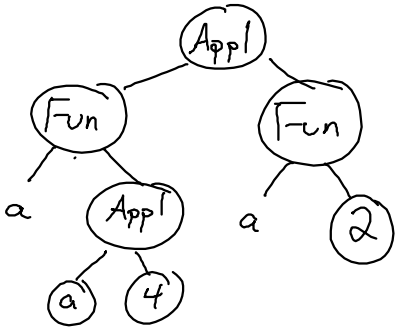
Abstract Syntax Trees

(Function a -> a + 1) 4	(Function a -> a + b) (4 + a)	(Function a -> a 4) (Function a -> 2)
		

Substitute : • [5/a]







(Function a → a 4) (Function a → 2) ⟹

$e \Rightarrow v$

$$\text{App}\ \frac{e_1 \Rightarrow \text{Function } x \to e \qquad e_2 \Rightarrow v_2 \qquad e[v_2/x] \Rightarrow v}{e_1\ e_2 \Rightarrow v}$$

$$\frac{\cdots \qquad \cdots \qquad \overline{2 \Rightarrow 2}}{(\text{Function a} \to 2)\ 4 \Rightarrow 2}$$

$$\frac{\overline{(\text{Function a} \to_a 4) \Rightarrow (\text{Function a} \to 4)} \qquad \overline{(\text{Function a} \to 2) \Rightarrow (\text{Function a} \to 2)}}{(\text{Function a} \to_a 4)(\text{Function a} \to 2) \Rightarrow 2}$$