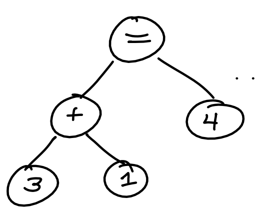
Type System

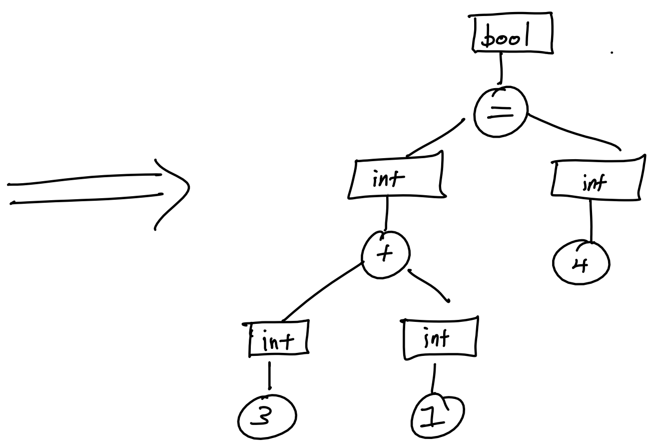
- What is a type system?
  - Organizes values into "types" : ex, "1" is a string; 1 is an int
  - Rules about how types are used
  - Rules about how types are inferred
- What is a type?
  - A type is a set of values.*
    - bool = { true, false }
    - int = { 0, 1, -1, ... }
- What is a set?
  - A collection of unique values.

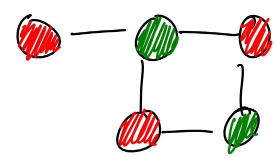
Using Static Typing

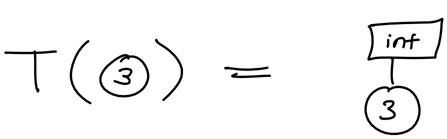
bipartite tree: types & expressions

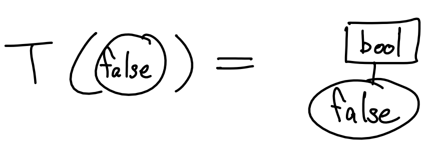
$3+1=4$

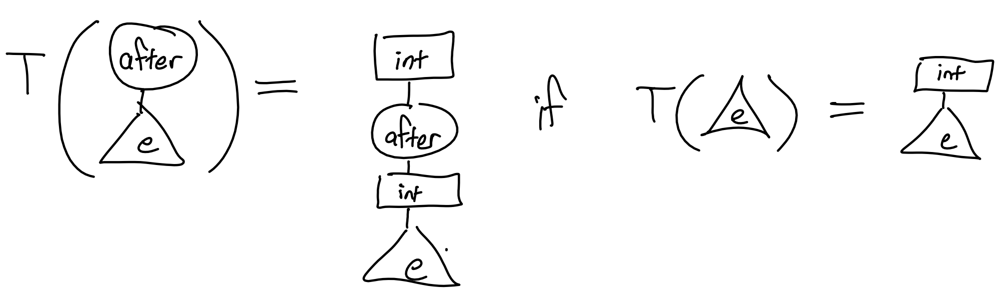


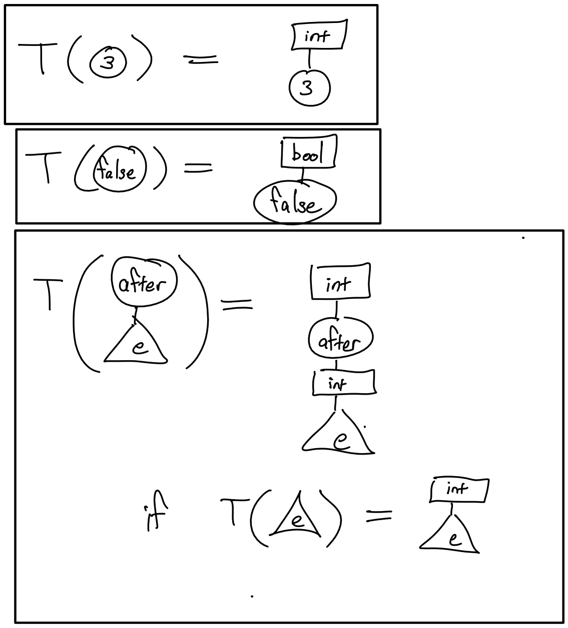




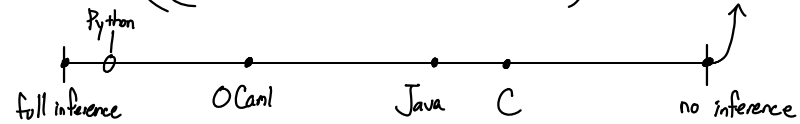


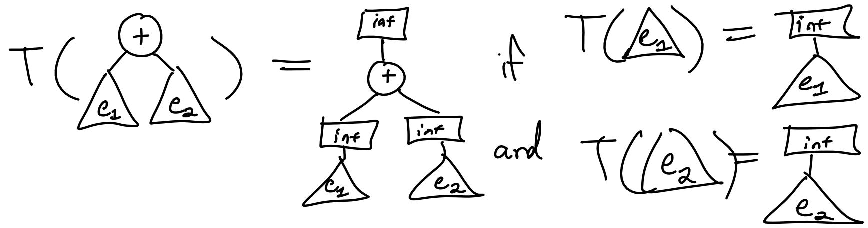


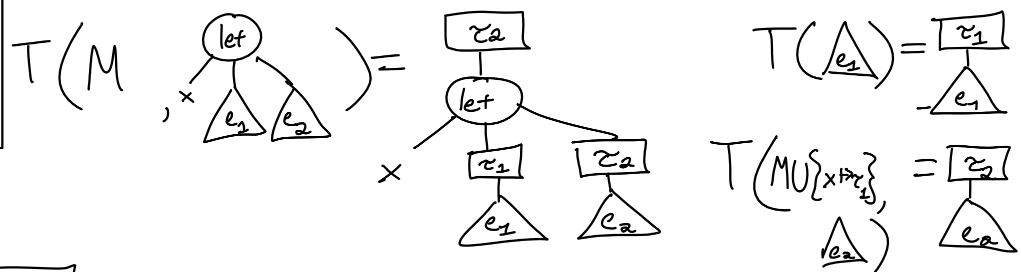


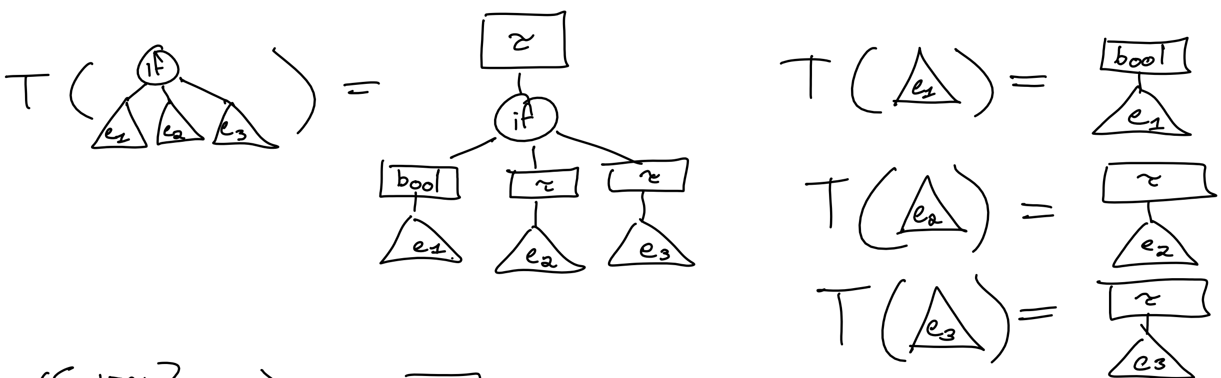


$1+3=4 \quad (((1:int)\ (+ : int \to int \to int)\ (3:int)) : int\ (= : int \to int \to bool)\ (4:int)) : bool$

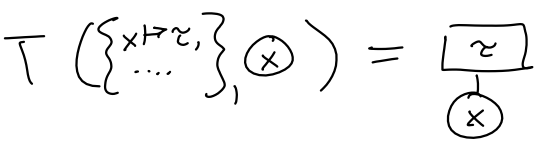


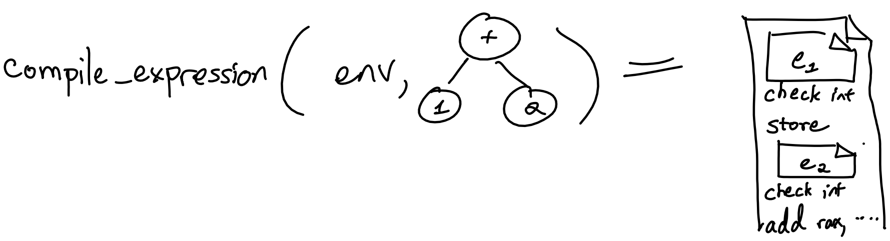


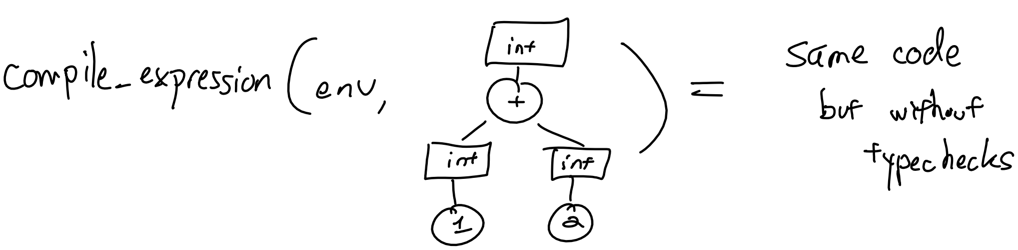


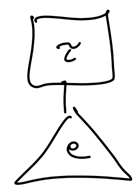


if b then
4
else
(1, 2)









means that
when you run e,
you get a value
of τ
(or an error, or
if runs forever)

In compilers, type systems are for:

1. detecting errors
2. proving facts that the compiler can use