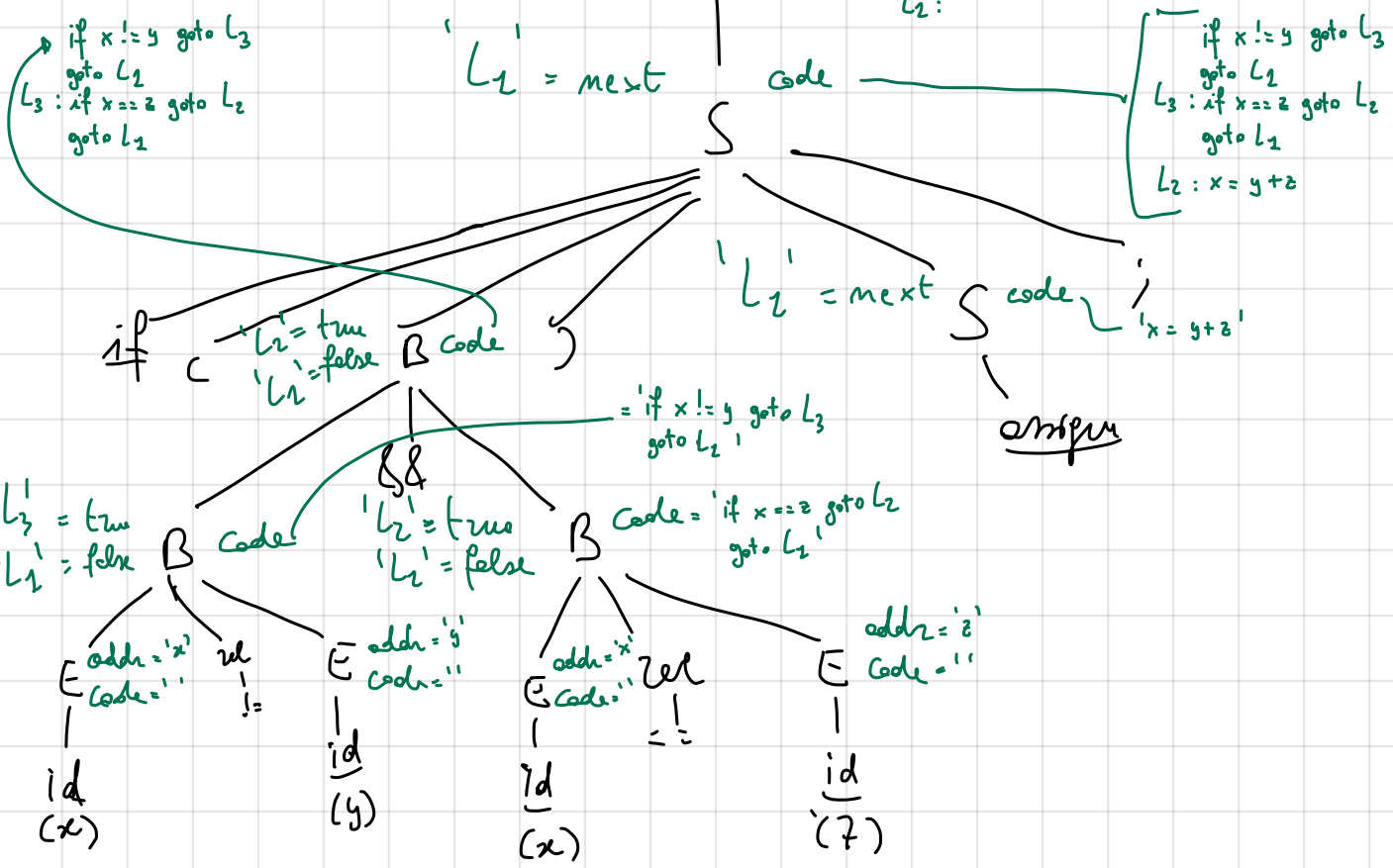


if (x != y && x == z) x = y + z;

if x != y goto L3  
 goto L2  
 L3: if x == z goto L2  
 goto L2  
 L2: x = y + z  
 L2:



$Expr ::= Expr + Expr \mid Expr - Expr \mid$   
 $Expr / Expr \mid Expr * Expr \mid - Expr \mid$   
 $\underline{id} \mid \underline{num}$

$Expr2 ::= Expr \ \&\& \ Expr \mid Expr \ \|\ \ Expr \mid ! \ Expr \mid$   
 $Expr \ \text{rel} \ Expr \mid \underline{id} \mid \underline{true} \mid \underline{false}$

$\text{typeOf}(\underline{num}) = \{ \text{float}, \text{int} \}$

$\text{lookupType}(\underline{id}) = \{ \text{float}, \text{int}, \text{boolean} \}$

Rules for a type system

$\frac{\text{typeOf}(\underline{num}) = \text{float}}{\underline{num}. \text{type} = \text{float}}$

$\frac{\text{typeOf}(\underline{num}) = \text{int}}{\underline{num}. \text{type} = \text{int}}$

$\frac{\times}{\underline{id}. \text{type} = \text{lookupType}(\underline{id})}$

$\frac{\times}{\underline{true}. \text{type} = \text{boolean}}$

$\frac{\times}{\underline{false}. \text{type} = \text{boolean}}$

$Expr_1. \text{type} = \text{int}$

$Expr_2. \text{type} = \text{int}$

$Expr_1. \text{type} = \text{float}$   
 $Expr_2. \text{type} = \text{float}$

$\frac{}{(Expr_1 + Expr_2). \text{type} = \text{int}}$

$\frac{}{(Expr_1 + Expr_2). \text{type} = \text{float}}$

$Expr_1. \text{type} = \text{int}$

$Expr_2. \text{type} = \text{float}$

+ symmetric rule

$\frac{}{(Expr_1 + Expr_2). \text{type} = \text{float}}$

No rule for type error: the type system cannot assign a type

type of (man) = float

---

{ } ⊢ man : float

$\Gamma \vdash E_2 : \text{int}$       $\Gamma \vdash E_2 : \text{int}$

---

$\Gamma \vdash E_2 + E_2 : \text{int}$

---

{ } ⊢ true : boolean

typeof(x) = int

---

{ x : int } ⊢ x : int