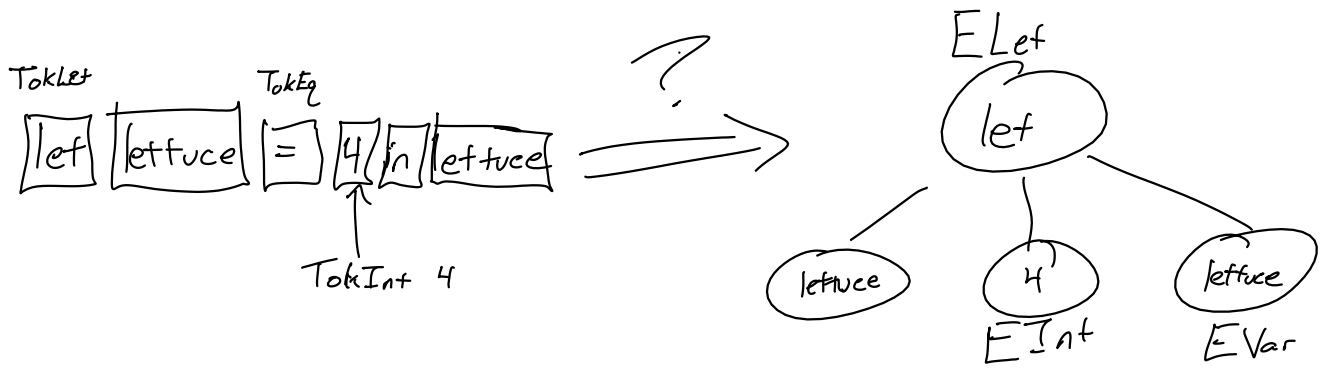
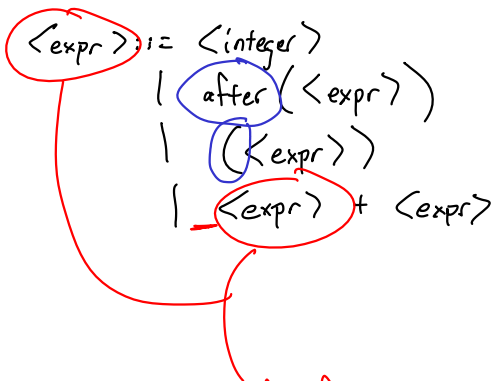


Magic Cloud





Left recursion

Left recursion elimination

It is always possible to rewrite a CFL grammar to eliminate left recursion.

$\langle \text{expr} \rangle ::= \langle \text{integer} \rangle \langle \text{expr tail} \rangle$
 $\quad | \text{after}(\langle \text{expr} \rangle) \langle \text{expr tail} \rangle$
 $\langle \text{expr tail} \rangle ::= + \langle \text{expr} \rangle$
 $\quad | \epsilon$

Precedence & Associativity

$\langle \text{expr} \rangle ::= \langle \text{integer} \rangle$
 $\quad | \langle \text{expr} \rangle + \langle \text{expr} \rangle$
 $\quad | \langle \text{expr} \rangle * \langle \text{expr} \rangle$
 $\quad | \langle \text{expr} \rangle - \langle \text{expr} \rangle$
 $\quad | (\langle \text{expr} \rangle)$

$\langle \text{expr} \rangle ::= \langle \text{additive expr} \rangle$
 $\langle \text{additive expr} \rangle ::= \langle \text{multiplicative expr} \rangle$
 $\quad | \langle \text{multiplicative expr} \rangle \langle \text{additive op} \rangle \dots$
 $\langle \text{mult expr} \rangle ::= \langle \text{primary expr} \rangle$
 $\quad | \langle \text{primary expr} \rangle * \dots$
 $\langle \text{primary expr} \rangle ::= \langle \text{integer} \rangle$
 $\quad | (\langle \text{expr} \rangle)$

$1 + 2 * 3 + 4 * (5 + 6) + 7$

① If "2 + 3 * 4", do I get

② If "2 + 3 + 4", do I get

