POSTFIX NOTATION

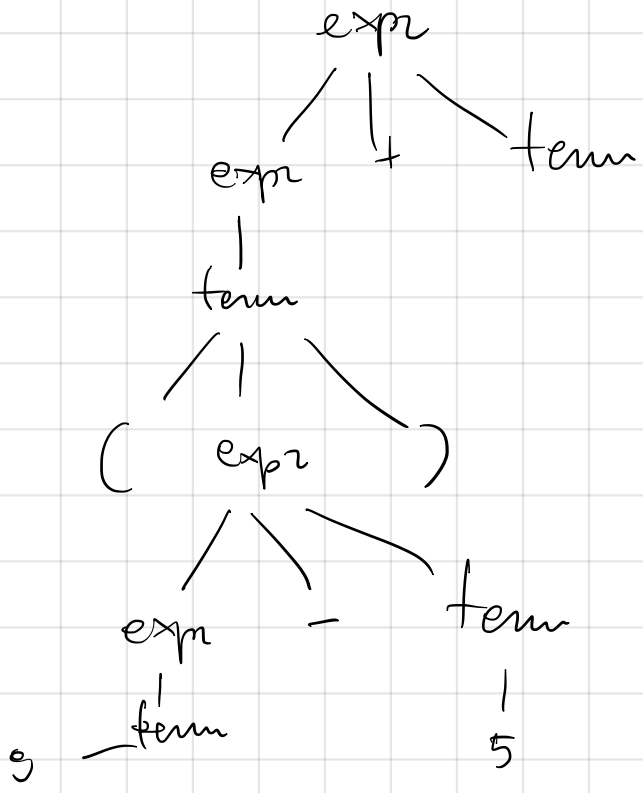
(9-5)+2 ⇝ 95-2+

9-(5+2) ⇝ 952+-

Attribute t for both expr and term

$expr \to expr_1 + term$	$expr.t = expr_2.t \,\|\| \, term.t \,\|\| \, '+'$
$expr \to expr_1 - term$	$expr.t = expr_2.t \,\|\| \, term.t \,\|\| \, '-'$
$expr \to term$	$expr.t = term.t$
$term \to 0$	$term.t = '0'$
$term \to 1$	$term.t = '1'$
⋮	⋮
$term \to 9$	$term.t = '9'$
$term \to (expr)$	$term.t = expr.t$

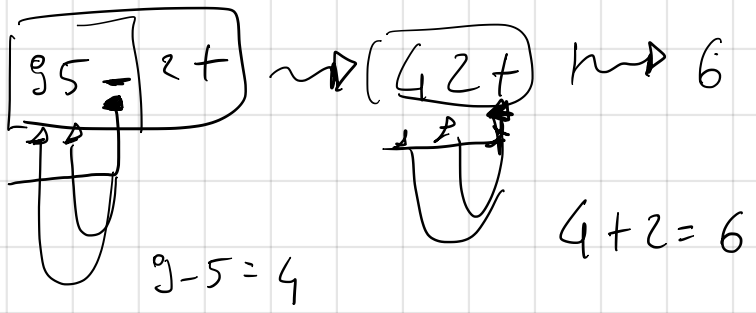
(9-5)+2



$$\begin{cases} \mathcal{T}[\![n]\!] = n \\ \mathcal{T}[\![(E)]\!] = \mathcal{T}[\![E]\!] \\ \mathcal{T}[\![E_1 \ op \ E_2]\!] = \mathcal{T}[\![E_2]\!]\ \mathcal{T}[\![E_2]\!]\ op \end{cases}$$

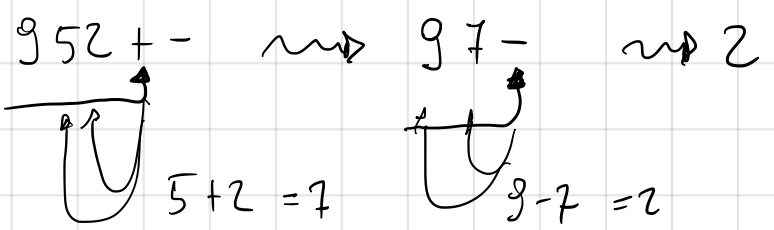
$\mathcal{T}[\![(9-5)+2]\!] = \mathcal{T}[\![(9-5)]\!]\ \mathcal{T}[\![2]\!] + =$

$\mathcal{T}[\![9-5]\!]\ \mathcal{T}[\![2]\!] + = \mathcal{T}[\![9]\!]\ \mathcal{T}[\![5]\!] - \ \mathcal{T}[\![2]\!] + =$

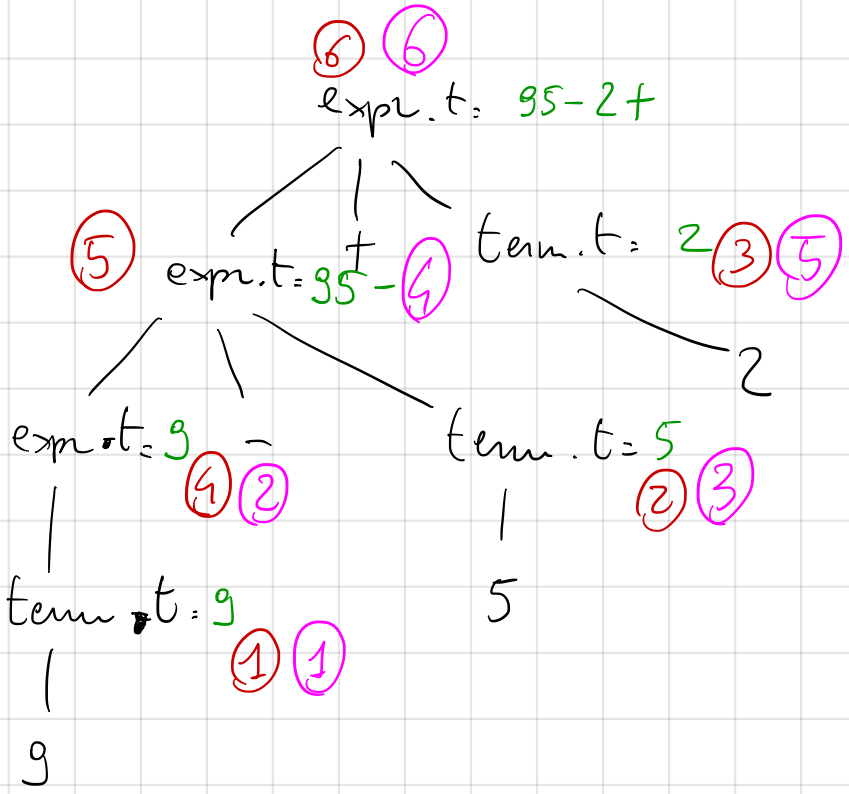
$=$ 

$\mathcal{T}[\![9-(5+2)]\!] = \mathcal{T}[\![9]\!]\ \mathcal{T}[\![(5+2)]\!] - =$

$\mathcal{T}[\![9]\!]\ \mathcal{T}[\![5+2]\!] - = 9\ \mathcal{T}[\![5]\!]\ \mathcal{T}[\![2]\!] + - = 952+-$



ANNOTATED PARSE TREE 9 - 5 + 2



POSTORDER VISIT

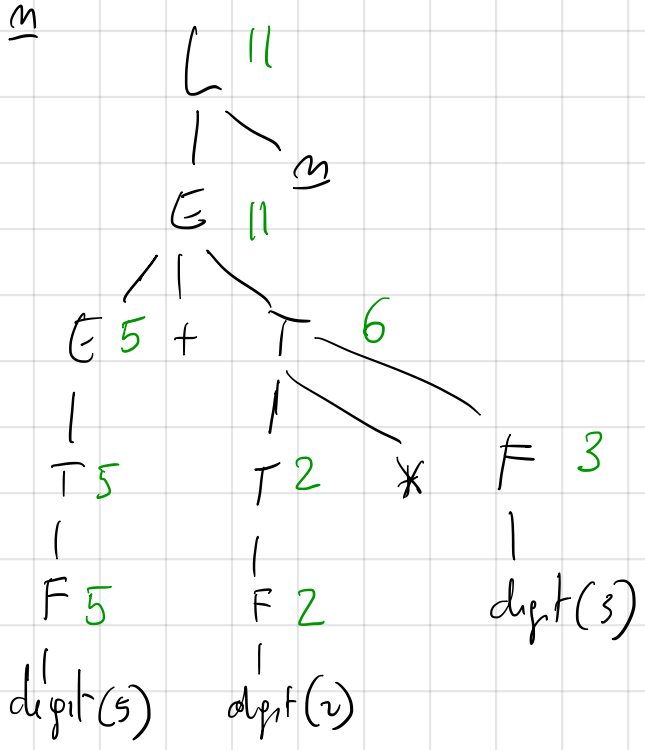
$L \to E\ \underline{n}$	$L.val = E.val$
$E \to E_1 + T$	$E.val = E_1.val \oplus T.val$
$E \to T$	$E.val = T.val$
$T \to T_1 * F$	$T.val = T_1.val \otimes F.val$
$T \to F$	$T.val = F.val$
$F \to (E)$	$F.val = E.val$
$F \to \underline{digit}$	$F.val = digit.lexvalue$

SDD

$L.val = E.val \to print(E.val)$

incidental side effect

$5 + 2 * 3\ \underline{n}$



$T \to F\,T'$ $\quad T'.inh = F.val$

$T.val = T'.val$

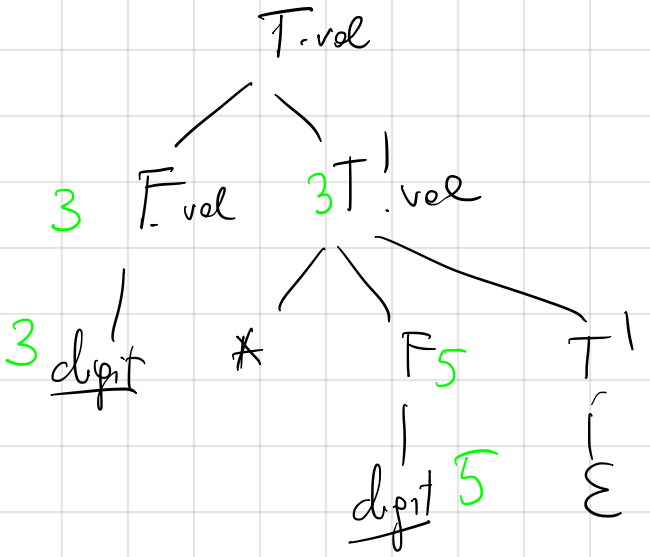
$T' \to * F\,T_1'$ $\quad T_1'.inh = T'.inh \otimes F.val$

$T'.val = T_1'.val$

$T' \to \varepsilon$ $\quad T'.val = T'.inh$

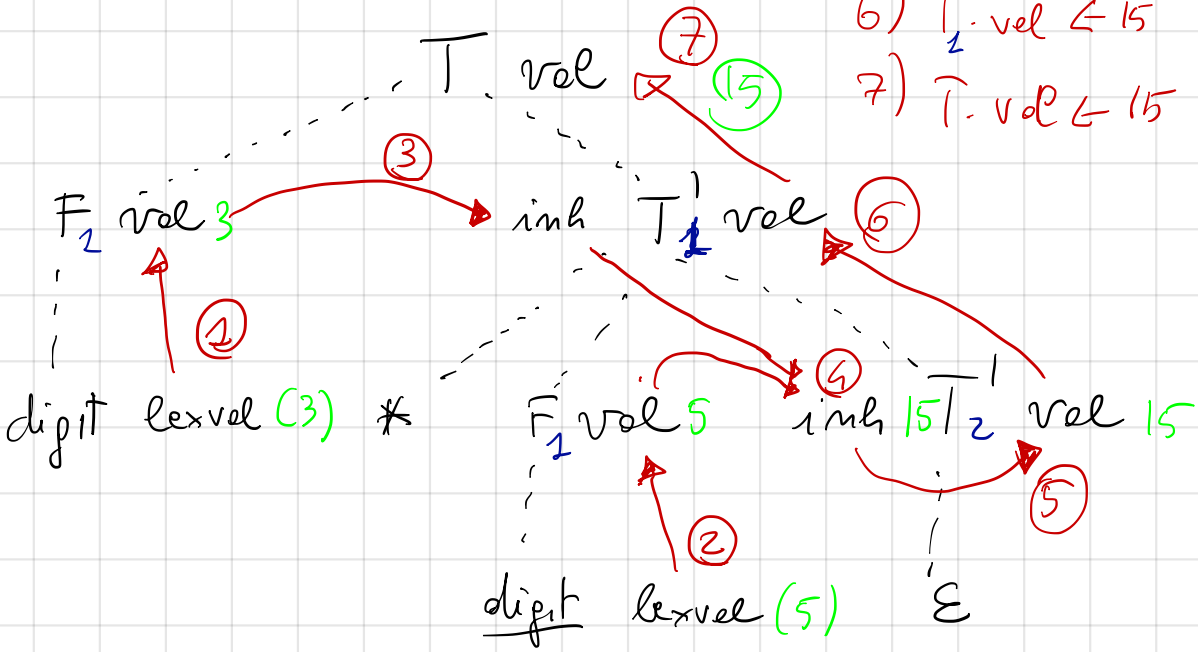
$F \to \underline{digit}$ $\quad F.val = \underline{digit}.lexval$

3 * 5



1) $F_1.val \leftarrow 3$
2) $F_2.val \leftarrow 5$
3) $T_1'.inh \leftarrow 3$
4) $T_2'.inh \leftarrow 3*5 = 15$
5) $T_2'.val \leftarrow 15$
6) $T_1'.val \leftarrow 15$
7) $T.val \leftarrow 15$

DEPENDENCY GRAPH

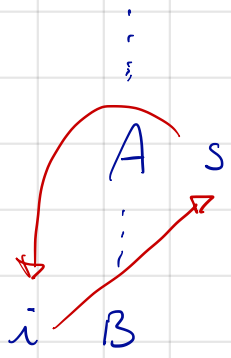


SDD with cycle

$A \rightarrow B$

$A.s = B.i$

$B.i = A.s + 1$



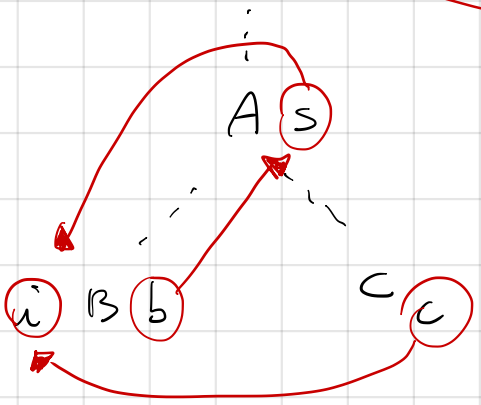
NOT FEASIBLE

There is not any order of execution that calculates the values of the attributes.

$A \rightarrow B\,C$ → c is not on the left of B

$A.s = B.b$

$B.i = C.c$ or $A.s$



There is no cycle

But the SDD is NOT L-attributed