

Attribute Grammars (G, A, R)

1. ? A.G. for counting the nr of vowels in a non-empty letter string. (lecture 11)
L-letter

$$S \rightarrow SL$$

$$S_{1..n} = S_{2..n} + L_{0..n}$$

$$S \rightarrow L$$

$$S_{1..n} = L_{1..n}$$

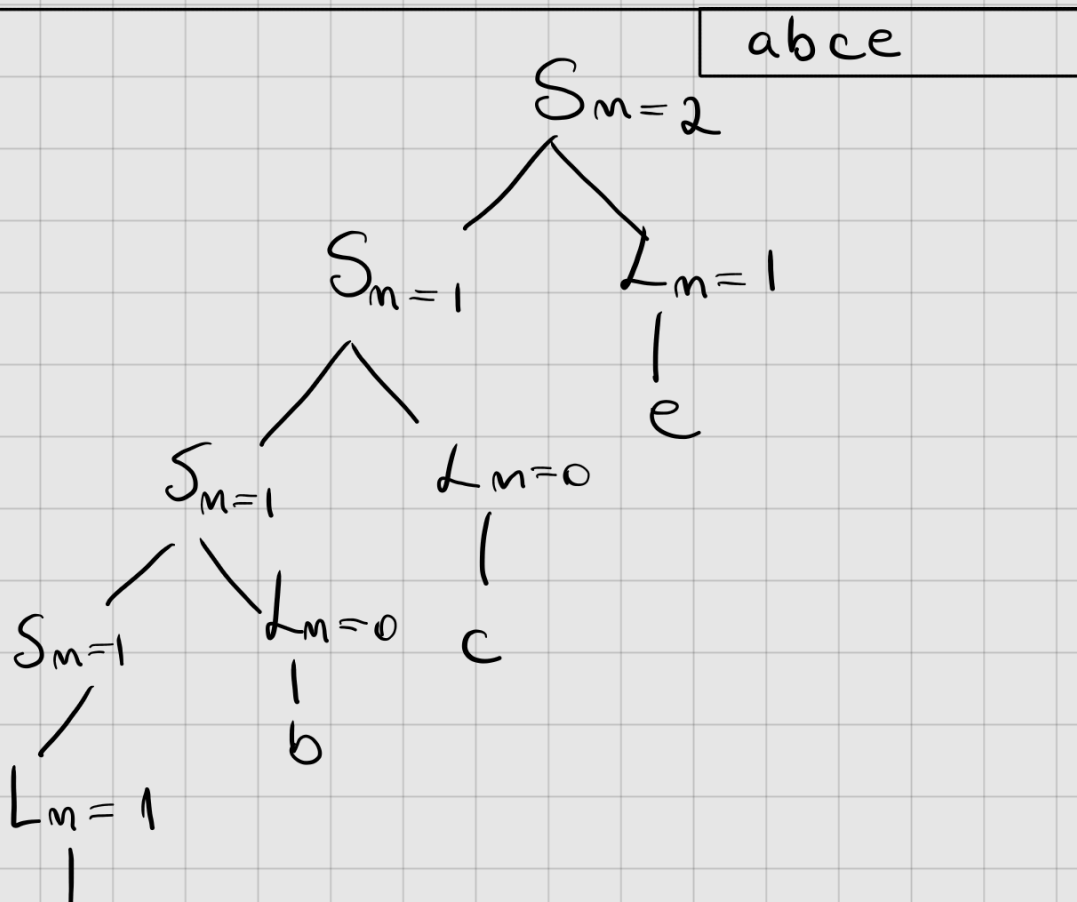
$$L \rightarrow a|e|i|o|u|A|E|i|O|U$$

$$L_{1..n} = 1$$

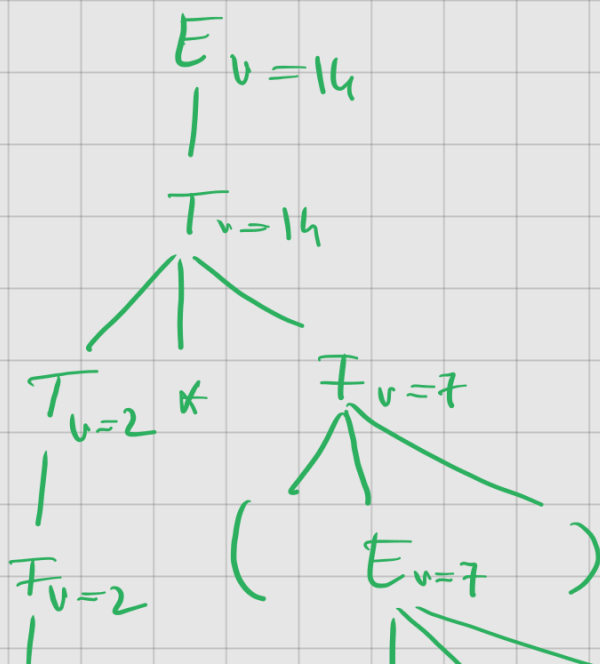
$$L \rightarrow b|c|d|f|...$$

$$L_{1..n} = 0$$

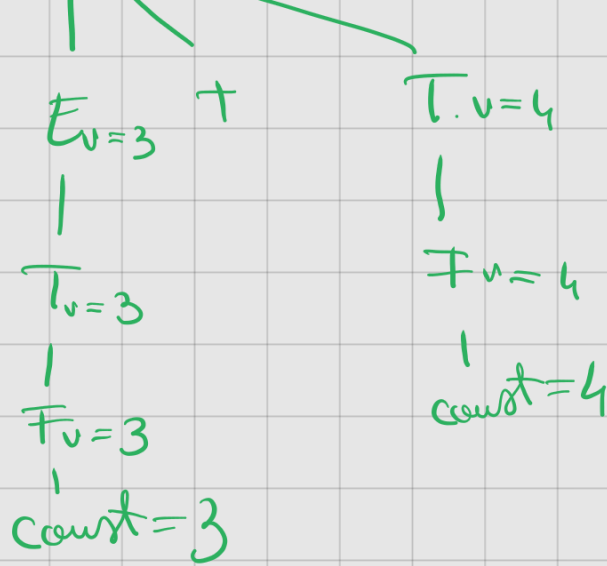
(rules are in the right of the rules)



2. ? AG. for computing the value of an arithmetic expressions. $\text{expr} (+, -, *, (,), \text{const})$.

$$E_{1,v} = E_{2,v} + T_{1,v}$$
$$E_{1,v} = E_{2,v} - T_{1,v}$$
$$E_v = T_v$$
$$T_{1,v} = T_{2,v} + T_{\infty,v}$$
$$T_{1,v} = T_{2,v} / F_v$$
$$T_v = F_v$$
$$F_{\nu} = E_{\nu}$$
$$T \cdot v = \text{const}$$
$$2^4(3+4)$$


count=2



3. Address Code

1. if (a > d) OR c AND (b < c)
 then : a := -1
 else : b := b + c
 → endif

current	operator	arg ₁	arg ₂	result
1	>	a	d	T ₁
2	<	b	c	T ₂
3	AND	c	T ₂	T ₃
4	OR	T ₁	T ₃	T ₄
5	goto	T ₄		(9)
6	+	b	c	T ₅
7	:=	T ₅		

8	goto		(11)
9	@	1	T_6
10	$:=$	T_6	a
11			

while($i < 100$ AND $j < 100$)

sum = sum + $i * j$

$i = i + 1$

$j = j * 2$

→ endwhile

current	operator	arg ₁	arg ₂	result
1	<	i	100	T_1
2	<	j	100	T_2
3	AND	T_1	T_2	T_3
4	NOT	T_3		T_4
5	goto	T_4		(14)
6	*	i	j	T_5
7	+	sum	T_5	T_6
8	-	T_1		

8	-	16		sum
9	+	i	1	T ₇
10	=	T ₇		i
11	*	j	2	T ₈
12	=	T ₈		j
13	goto	T ₈		(1)
14				

for i = 1, n do

sum = i * (i - 2) + sum

endfor

current	operator	arg ₁	arg ₂
(1)	=	i	1
(2)	>	i	n
(3)	goto	(2)	(11)
(4)	-	i	2
(5)	*	i	(4)
(6)	+	(5)	sum

(6)	+	(5)	/sum
(7)	=	num	(6)
(8)	+	i	1
(9)	=	i	(8)
(10)	goto		(2)
(11)			
