

5. Fie gramatica cu urm. reguli de producție

$$S \rightarrow a S_1 \mid b S \quad 1$$

$$S \rightarrow a S \quad 2$$

$$S \rightarrow c \quad 3$$

$$S_1 \rightarrow a S_1 \mid b S_1 \quad 4$$

$$S_1 \rightarrow c \quad 5$$

$\Rightarrow$  la augmented grammar adaug  $S' \rightarrow S$

a) Construiți colecția canonică și tabelul de analiză LR(1). Gramatica este LR(1)?

b) Gramatica este ambiguă? Justificați!

a)  $I_0: S' \rightarrow \cdot S, \$$   
 $S \rightarrow \cdot a S_1 \mid b S, \$$   
 $S \rightarrow \cdot a S, \$$   
 $S \rightarrow \cdot c, \$$

goto( $I_0, S$ )

$$I_1: S' \rightarrow S \cdot, \$$$

goto( $I_0, a$ )

$$I_2: S \rightarrow a \cdot S_1 \mid b S, \$$$
  
 $S \rightarrow a \cdot S, \$$   
 $S_1 \rightarrow \cdot a S_1 \mid b S_1, b$   
 $S_1 \rightarrow \cdot c, b$   
 $S \rightarrow \cdot a S_1 b S, \$$   
 $S \rightarrow \cdot a S, \$$   
 $S \rightarrow \cdot c, \$$

goto( $I_0, c$ )

$$I_3: S \rightarrow c \cdot, \$$$

goto( $I_2, S_1$ )

$$I_4: S \rightarrow a S_1 \cdot b S, \$$$

goto( $I_2, S$ )

$$I_5: S \rightarrow a S \cdot, \$$$

goto( $I_2, a$ )

$$I_6: S_1 \rightarrow a \cdot S_1 b S_1, b$$
  
 $S \rightarrow a \cdot S_1 b S, \$$

$$S \rightarrow a \cdot S, \$ \rightarrow I_5$$

$$S_1 \rightarrow a \cdot S_1 b S_1, b \rightarrow I_6$$

$$S_1 \rightarrow a \cdot c, b \rightarrow I_6$$

$$S \rightarrow a \cdot S_1 b S, \$ \rightarrow I_6$$

$$S \rightarrow a \cdot S, \$ \rightarrow I_5$$

$$S \rightarrow a \cdot c, \$ \rightarrow I_5$$

goto( $I_2, c$ )

$$I_7: S_1 \rightarrow c \cdot, b$$
  
 $S \rightarrow c \cdot, \$$

goto( $I_4, b$ )

$$I_8: S \rightarrow a S_1 b \cdot S, \$$$

$$S \rightarrow a S_1 b \cdot S, \$ \rightarrow I_2$$

$$S \rightarrow a S_1 b \cdot S, \$ \rightarrow I_2$$

$$S \rightarrow a S_1 b \cdot S, \$ \rightarrow I_2$$

goto( $I_6, S_1$ )

$$I_9: S_1 \rightarrow a S_1 \cdot b S_1, b$$
  
 $S \rightarrow a S_1 \cdot b S, \$$

goto( $I_8, S$ )

$$I_{10}: S \rightarrow a S_1 b S \cdot, \$$$

goto( $I_0, b$ )

$$I_{11}: S_1 \rightarrow a S_1 \cdot b S_1, b$$

$$S \rightarrow a S_1 \cdot b S, \$ \rightarrow I_{10}$$

$$S_1 \rightarrow a S_1 \cdot b S_1, b \rightarrow I_{11}$$

$$S_1 \rightarrow a \cdot c, b \rightarrow I_6$$

$$S \rightarrow a S_1 \cdot b S, \$ \rightarrow I_{10}$$

$$S \rightarrow a \cdot S, \$ \rightarrow I_5$$

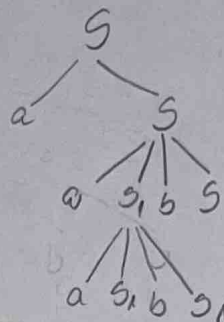
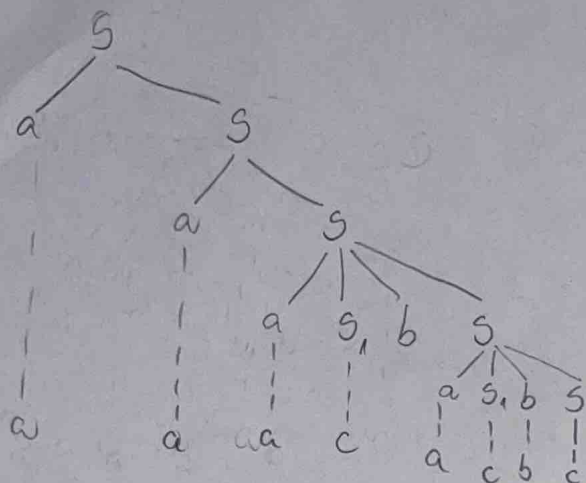
$$S \rightarrow a \cdot c, \$ \rightarrow I_5$$

goto( $I_{11}, S_1$ )

$$I_{12}: S_1 \rightarrow a S_1 b S_1 \cdot, b$$

STATE	ACTION				GOTO	
	a	b	c	\$	S	S <sub>1</sub>
0	S2		S3		1	
1				ACCEPT		
2	S6		S7		5	4
3				r3		
4		S8				
5	S2			r2		
6	S6		S7		5	9
7		r5		r3		
8	S2		S3		10	
9		S11				
10				r1		
11	S6		S7		10	12
12		r4				

b) recventas

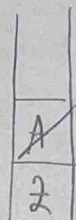
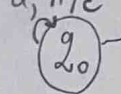
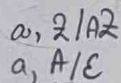


! a resit că este  $LB(1)$ , încep gramatică ambiguă  
nu este  $LB(1) \Rightarrow$  gr. nu este ambiguă!

NOJ PLM nu ier

4.

		a	b	c	
$q_0$	2	$(q_0, A2)$		$(q_1, c)$	0
	A	$(q_0, c)$			
$q_1$	2				1
	A		$(q_1, A)$		



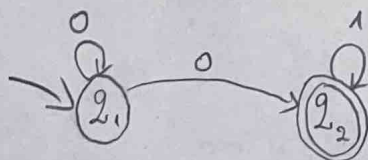
aa

nu e determinat p. ca avem 2 moduri sa ajungem in starea finala

1. prim adăugăm nr. par de  $a$ -uri apoi mergem în  $2_1$

ii. prin trecere direct în  $g_1$

3.  $00^x 0^x |$



2.  $S \rightarrow 0A1$  secvența 000a111  $L(6)$   
 $A \rightarrow 0S1$   
 $A \rightarrow a$

$$L = \{ 0^{2m+1} a 1^{2m+1} \mid m \in \mathbb{N} \}$$

încercăm: cu lema de pompare limb. independent de context

$$z = uv^iwx^iy$$

$$|z| \geq m$$

$$z = uvwx y$$

$$|vwx| \leq m$$

$$vx \neq \varepsilon$$

$$z = 000a111 \Rightarrow m \leq 4$$

$$u = 0$$

$$v = 00$$

$$w = a$$

$$x = 11$$

$$y = 1$$

$$|vwx| = 5 \Rightarrow m \geq 5$$

$$\text{alegem } m = 6$$

$$z^i = 0(00)^i a (11)^i 1$$

$$i = 0 \Rightarrow 0a1 \in L$$

$$i = 1 \Rightarrow 000a111 \in L \quad \forall i \in \mathbb{N}$$

...

$$\forall i \in \mathbb{N} \Rightarrow z = 0(00)^i a (11)^i 1 \in L(6)$$

i verificare:  $i = 0 \Rightarrow z = 0a1 \in L(6)$  „A”

$$S \rightarrow 0A1 \rightarrow 0a1$$

ii demonstrație: pp  $z(k) \in A^* \Rightarrow z(k+1) \in A^*$

$$z(k): 0(00)^k a (11)^k 1 \in L(6) \Rightarrow \exists \text{ o derivație a lui } S \text{ care să obțină } 0(00)^k a (11)^k 1$$

$$\text{assumpt } z(k+1): 0(00)^{k+1} a (11)^{k+1} 1 = 000(00)^k a (11)^k 111$$

$$S \rightarrow 0A1 \rightarrow 00S11 \quad (1) \quad \Rightarrow S \Rightarrow^* 000(00)^k a (11)^k 111$$

$$S \Rightarrow^* 0(00)^k a (11)^k 1 \quad (2) \quad \left. \begin{array}{l} (1) \\ (2) \end{array} \right\} \Rightarrow S \Rightarrow^* 000(00)^k a (11)^k 111$$

(aka  $\exists$  o deriv. a lui  $S$  care să obțină asta)

1. La compilare, cuvintele cheie sunt recunoscute în timpul: analizei lexicale