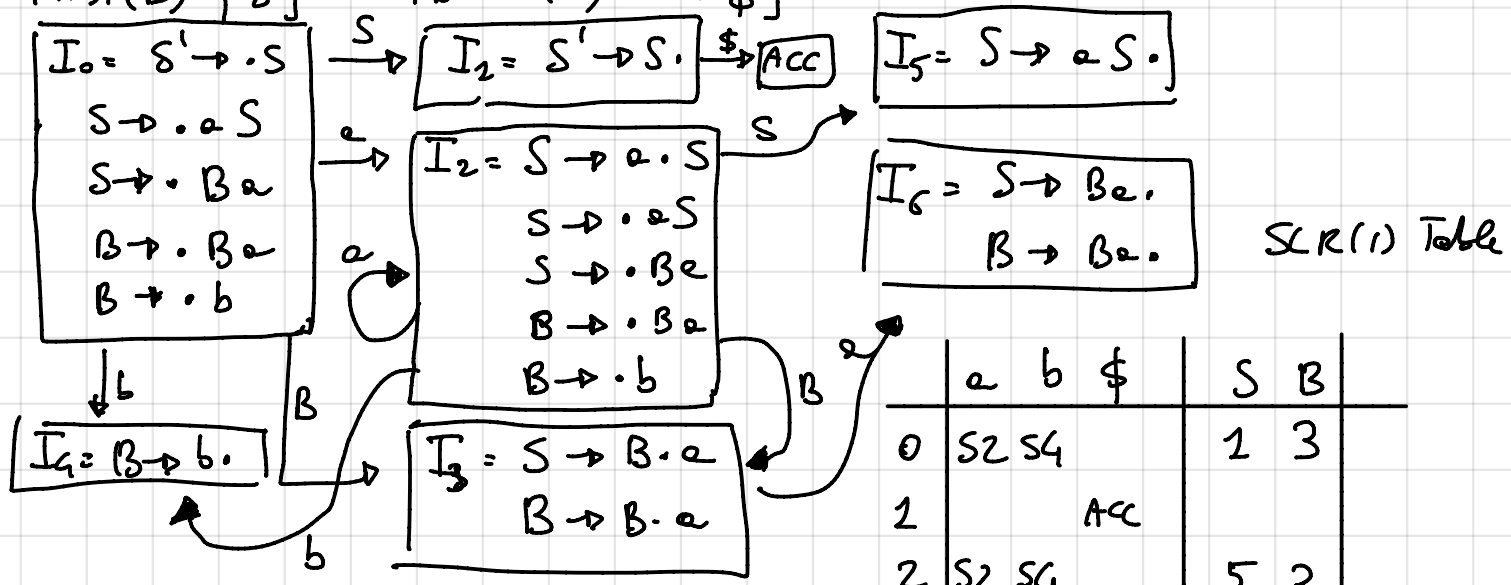
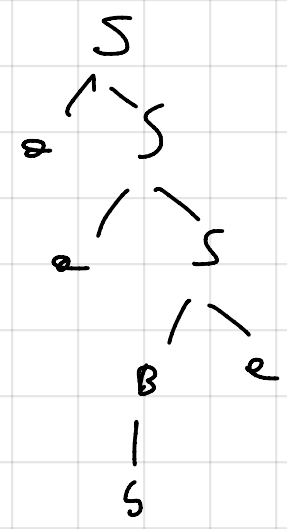


$S \rightarrow aS$ | Ba | $B \rightarrow Ba$ | b $(S' \rightarrow S) \Rightarrow a b e \$$
 $FIRST(S) = \{a, b\}$ $FOLLOW(S') = \{\$\}$ $FOLLOW(B) = \{a\}$
 $FIRST(B) = \{b\}$ $FOLLOW(S) = \{\$\}$



	a	b	\$	S	B
0	S2 S4			1	3
1			ACC		
2	S2 S4			5	3
3	S6				
4	r4				
5			r2		
6	r3		r2		

STACK	SYM	INP	ACT
$\emptyset \$$	$\$$	$a b e \$$	Shift 2
$2 \emptyset \$$	$a \$$	$e b e \$$	Shift 2
$2 2 \emptyset \$$	$a a \$$	$b a \$$	Shift 4
$4 2 2 \emptyset \$$	$b a a \$$	$a \$$	Red $B \rightarrow b$
$3 2 2 \emptyset \$$	$B a a \$$	$a \$$	Shift 6
$6 3 2 2 \emptyset \$$	$a B a a \$$	$\$$	Red $S \rightarrow B a$
$5 2 2 \emptyset \$$	$S a a \$$	$\$$	Red $S \rightarrow a S$
$5 2 \emptyset \$$	$S a \$$	$\$$	Red $S \rightarrow a S$
$1 \emptyset \$$	$S \$$	$\$$	ACC



$S \Rightarrow aS \Rightarrow aaS \Rightarrow a a B e \Rightarrow a b e$
zm zm zm zm

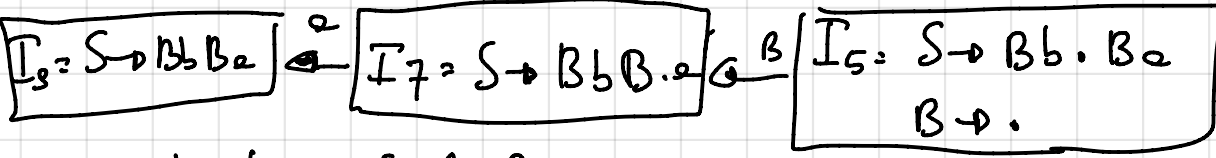
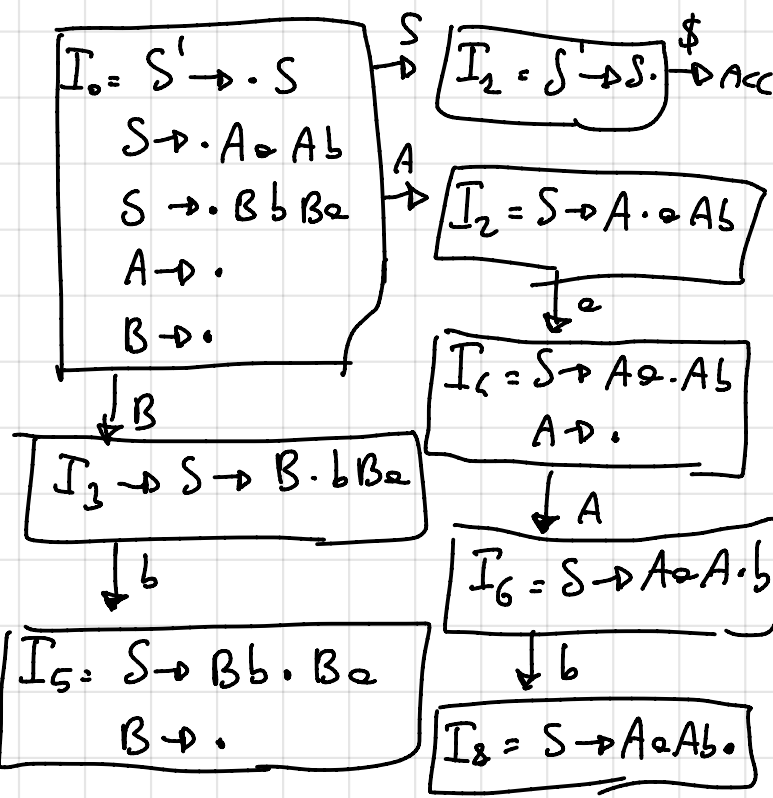
G_2 $S \rightarrow A^2 A b \mid B b B^2$ $A \rightarrow \epsilon$ $B \rightarrow \epsilon$ $L(2)$ $SLR(1)$

$FIRST(S) = \{a, b\}$ $FOLLOW(S) = \{\$, \}$
 $FIRST(A) = \{\epsilon\}$ $FOLLOW(A) = \{a, b\}$
 $FIRST(B) = \{\epsilon\}$ $FOLLOW(B) = \{a, b\}$

$L(2)$

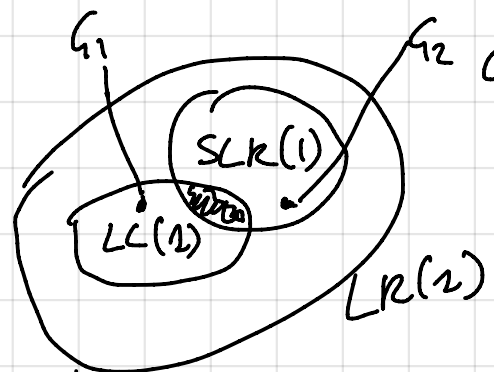
	a	b	\$
S	$S \rightarrow A^2 A b$	$S \rightarrow B b B^2$	
A	$A \rightarrow \epsilon$	$A \rightarrow \epsilon$	
B	$B \rightarrow \epsilon$	$B \rightarrow \epsilon$	

→ the grammar is $L(2)$



a	b	\$	S	A	B
0 r4	1 r4		1	2	3
0 r3	1 r3				

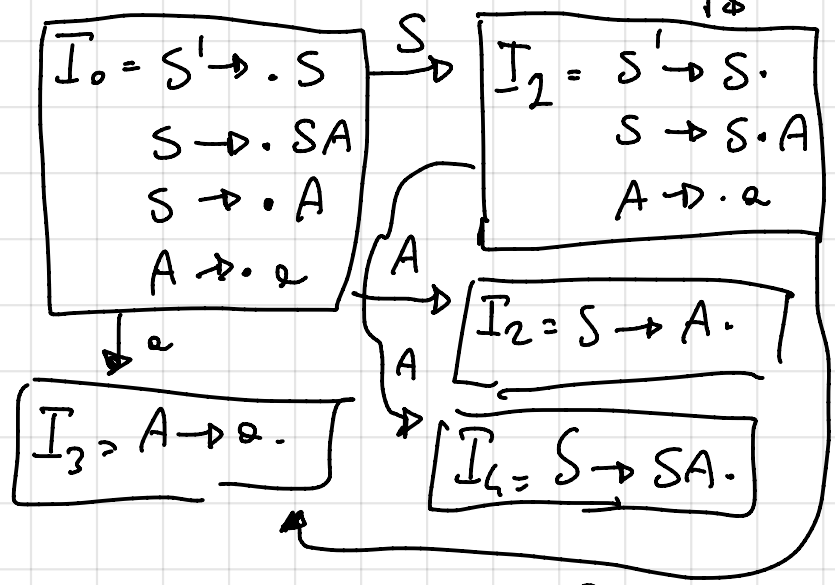
reduce/reduce conflict ⇒ the grammar is not $SLR(1)$



G_2 $S \rightarrow SA^2 A$ $A \rightarrow a$ $S' \rightarrow S$

Left-recursive ⇒ G_2 is not $LR(1)$

	a	\$	S	A
0	S3		1	2
1	S3	Acc		4
2	r2	r2		
3	r3	r3		
4	r1	r1		



$FIRST(S) = \{a\}$
 $FIRST(A) = \{a\}$
 $FOLLOW(S) = \{\$, a\}$
 $FOLLOW(A) = \{\$, a\}$

G_2 is $SLR(1)$

$$S \rightarrow L^2 = R^2 \mid R^2$$

$$L \rightarrow *^3 R^3 \mid id^4$$

$$R \rightarrow L^5$$

$$id = **id$$

SLR(1)?

$$S' \xrightarrow{0} S$$

$$*id = id$$

$$*id = ***id$$

$$FIRST(S) = \{id, *\}$$

$$FIRST(L) = \{id, *\}$$

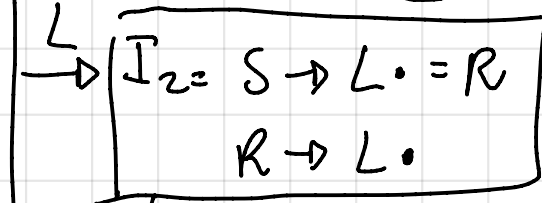
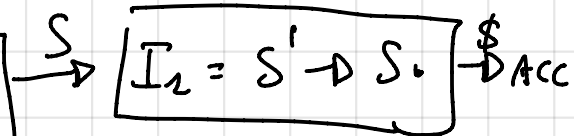
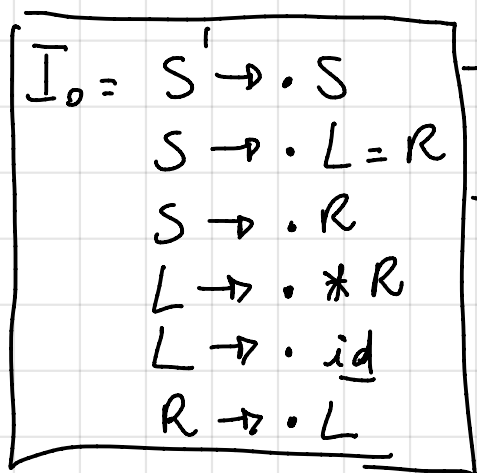
$$FIRST(R) = \{id, *\}$$

$$FOLLOW(S') = \{\$ \}$$

$$FOLLOW(S) = \{ \$ \}$$

$$FOLLOW(L) = \{ =, \$ \}$$

$$FOLLOW(R) = \{ \$, = \}$$



In this state there will be a shift/reduce conflict for = :

S3 for = and r5 for =

	=	id	*	\$	S	L	R
0							
1							
2							



the grammar is not SLR(1)

$$S' \xrightarrow{0} S \xrightarrow{1} L = R \xrightarrow{5} L = L \xrightarrow{4} L = id \xrightarrow{3} *R = id$$

$\xrightarrow{2m}$ $\xrightarrow{2m}$ $\xrightarrow{2m}$ $\xrightarrow{2m}$

$$S' \xrightarrow{1m} S \Rightarrow L = R$$

$E \Rightarrow T \Rightarrow T * F \Rightarrow T * id \Rightarrow F * id \Rightarrow (E) * id$

$E \rightarrow E + T \mid T$
 $T \rightarrow T * F \mid F$
 $F \rightarrow (E) \mid id$

$F \rightarrow (E)$

S-R Parser

valid prefix (E)

STACK

INPUT

(E) * is NOT a valid prefix

(E)

* id \$

Red $F \rightarrow (E)$

STACK

not possible

* (E) \$

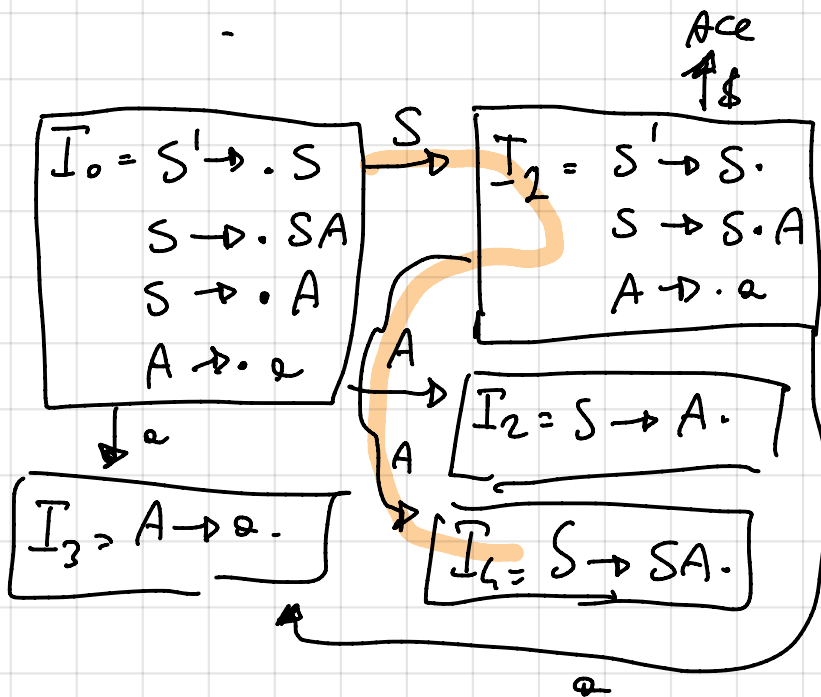
(E) is a valid prefix

STACK

INPUT

EC \$

) * id \$



Path SA

SA is a valid prefix and all the items that are valid for SA are those in I_4

From theory of LR(2)