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CLR(1) Parsing

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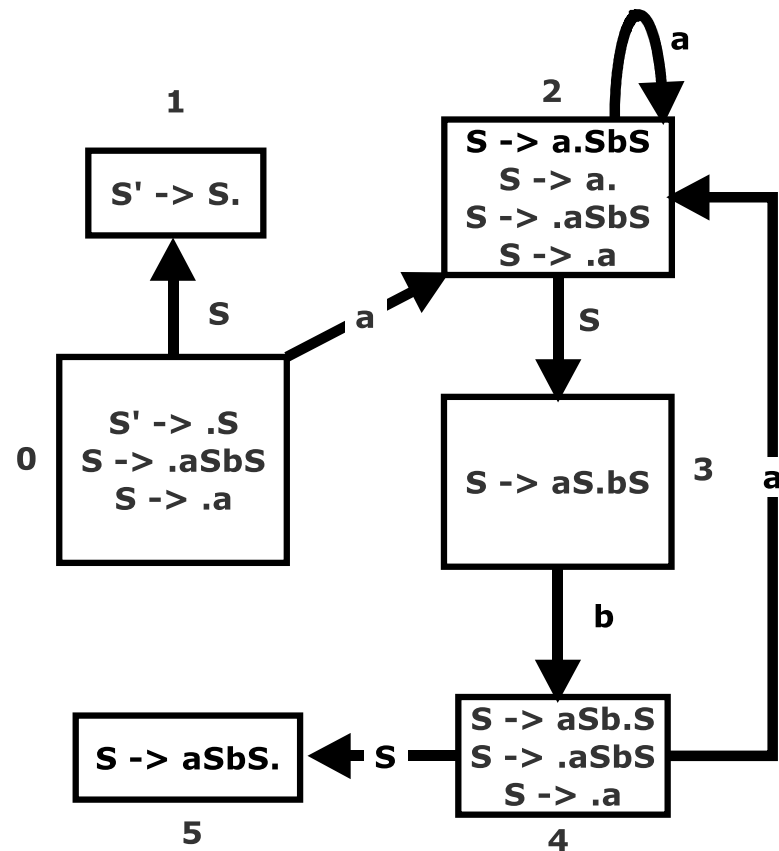
SLR (1) Parsing

Construct the LR(0) collection of items for the following Grammar and design the SLR(1) parsing table and find out whether this grammar is SLR(1) or not

$S \rightarrow aSbS$

$S \rightarrow a$

SLR (1) Parsing



BLANK CELLS ARE ERROR ENTRIES

SLR (1) PARSING TABLE

	ACTION			GOTO
	a	b	\$	
0	S2			1
1			ACCEPT	
2	S2	R2	R2	3
3		S4		
4	S2			5
5		R1	R1	

0 S' --> S
1 S --> aSbS
2 S --> a

Example

Construct the LR(0) collection of items for the following Grammar and design the SLR(1) parsing table and find out whether this grammar is SLR(1) or not.

$$S \rightarrow L = R$$

$$S \rightarrow R$$

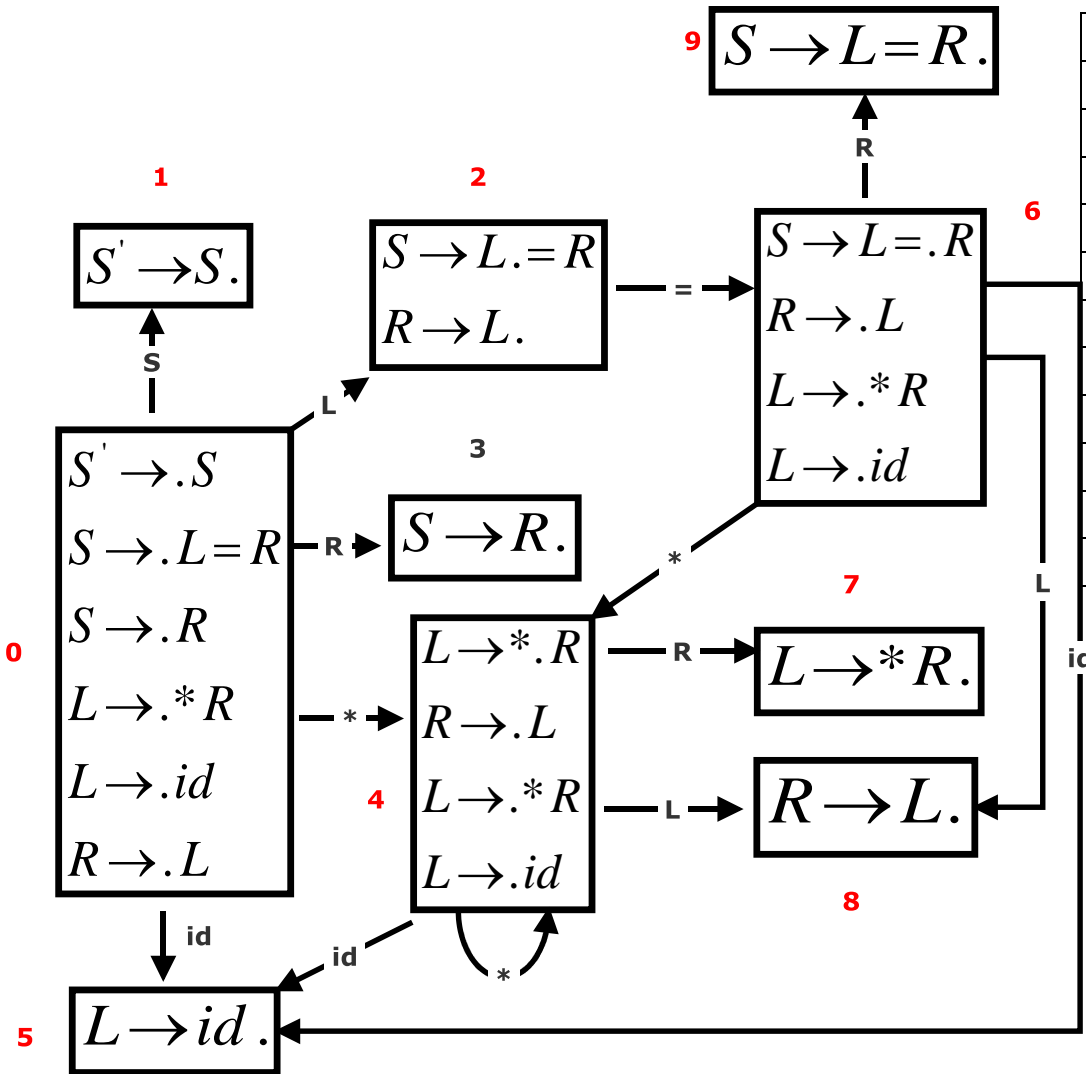
$$L \rightarrow * R$$

$$L \rightarrow id$$

$$R \rightarrow L$$

Example

SLR (1) PARSING TABLE



	Action				Goto		
	=	*	id	\$	S	L	R
0		S4	S5		1	2	3
1				accept			
2	S6/R5			R5			
3				R2			
4		S4	S5			8	7
5	R4			R4			
6		S4	S5			8	9
7	R3			R3			
8	R5			R5			
9				R1			

- 0 $S' \rightarrow S$
- 1 $S \rightarrow L=R$
- 2 $S \rightarrow R$
- 3 $L \rightarrow *R$
- 4 $L \rightarrow id$
- 5 $R \rightarrow L$

LR (1) Items

An *LR(1) item* has the form $[I, t]$ where I is an LR(0) item and t is a lookahead token.

As the dot moves through the right-hand side of I , token t remains attached to it. LR(1) item $[A \rightarrow \alpha \cdot, t]$ calls for a reduce action when the lookahead is t .

CANONICAL LR(1) PARSER

Canonical LR Parsing

Revised LR (0) items needs to add a terminal symbol as a second component (look ahead symbol)

The general form of the item becomes

$$[A \rightarrow \alpha.\beta, a]$$

which is called LR(1) item.

Closure Operation

repeat

for each item $[A \rightarrow \alpha.B\beta, a]$ in I

for each production $B \rightarrow \gamma$ in G'

and for each terminal b in $\text{First}(\beta a)$

add item $[B \rightarrow .\gamma, b]$ to I

until no more additions to I

Example

Construct the LR(1) collection of items for the following Grammar and design the CLR(1) parsing table and find out whether this grammar is CLR(1) or not.

$S \rightarrow AA$

$A \rightarrow aA$

$A \rightarrow b$

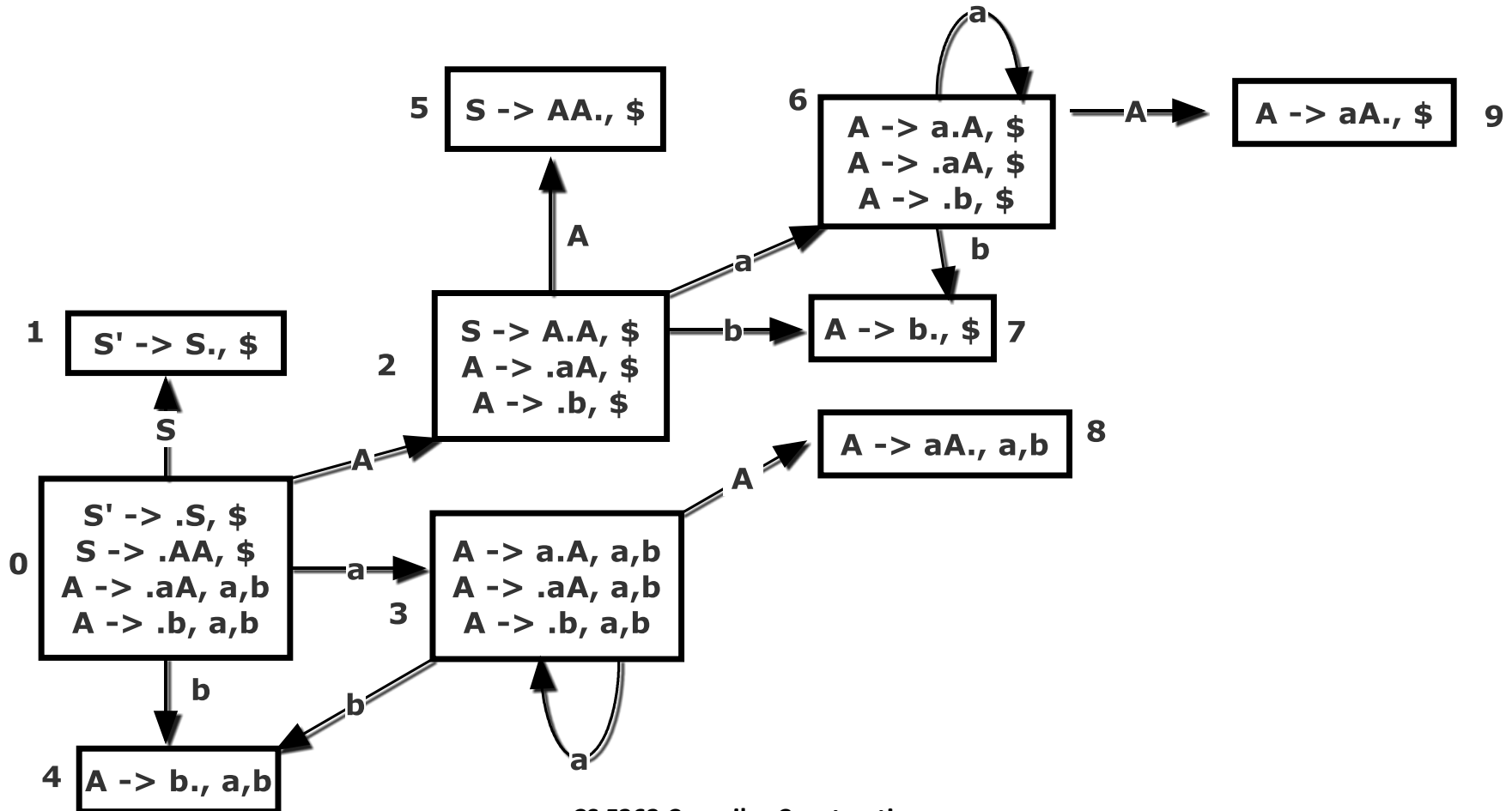
GOTO Graph

0S' -> S

1S -> AA

2A -> aA

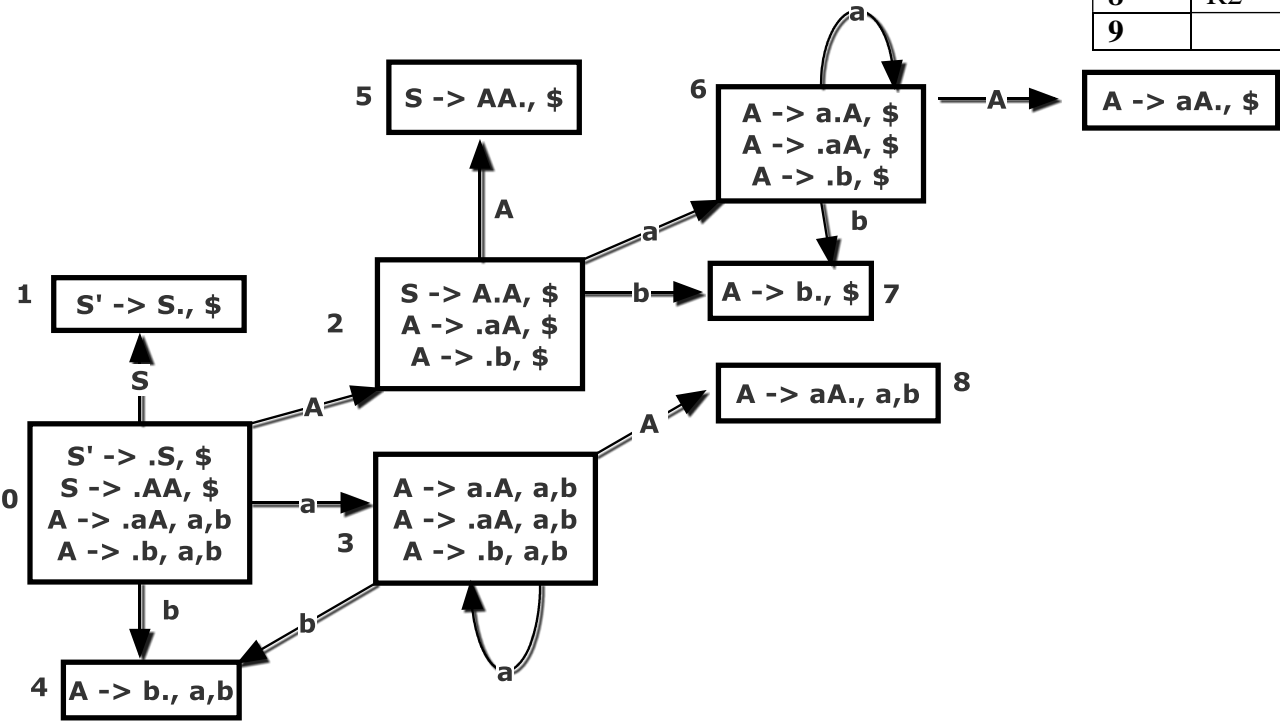
3A -> b



CLR (1) Parsing Table

BLANK CELLS ARE ERROR ENTRIES

	ACTION			GOTO	
	a	b	\$	S	A
0	S3	S4		1	2
1			accept		
2	S6	S7			5
3	S3	S4			8
4	R3	R3			
5			R1		
6	S6	S7			9
7			R3		
8	R2	R2			
9			R2		



CLR (1) PARSING TABLE

- 0S' -> S
- 1S -> AA
- 2A -> aA
- 3A -> b