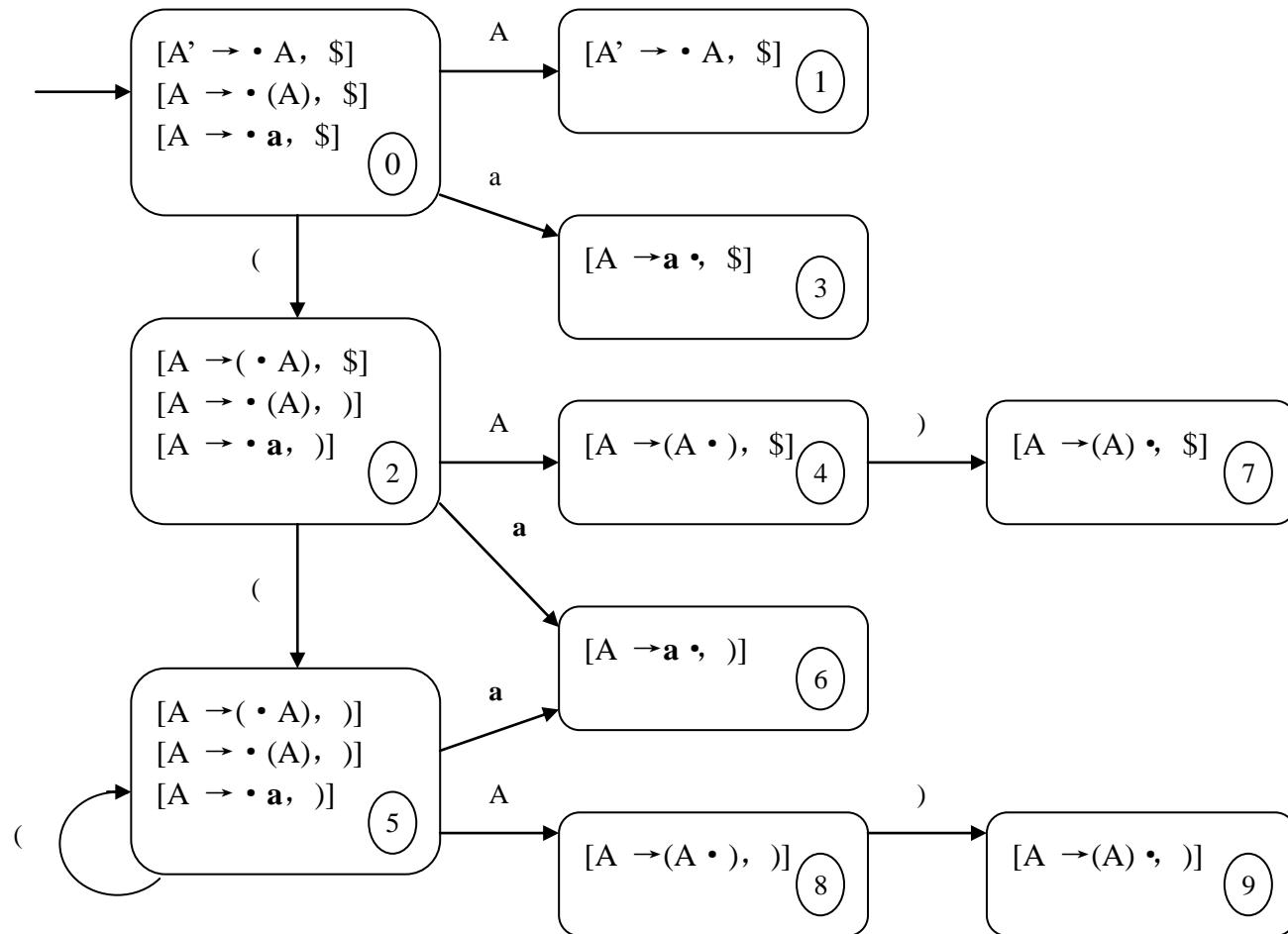


CANONICAL LR(1)

Prepared By
Ms. Deepthi

$A \rightarrow (A) \mid a$

LR(1) DFA



The Grammar:

- (1) $A \rightarrow (A)$
- (2) $A \rightarrow a$

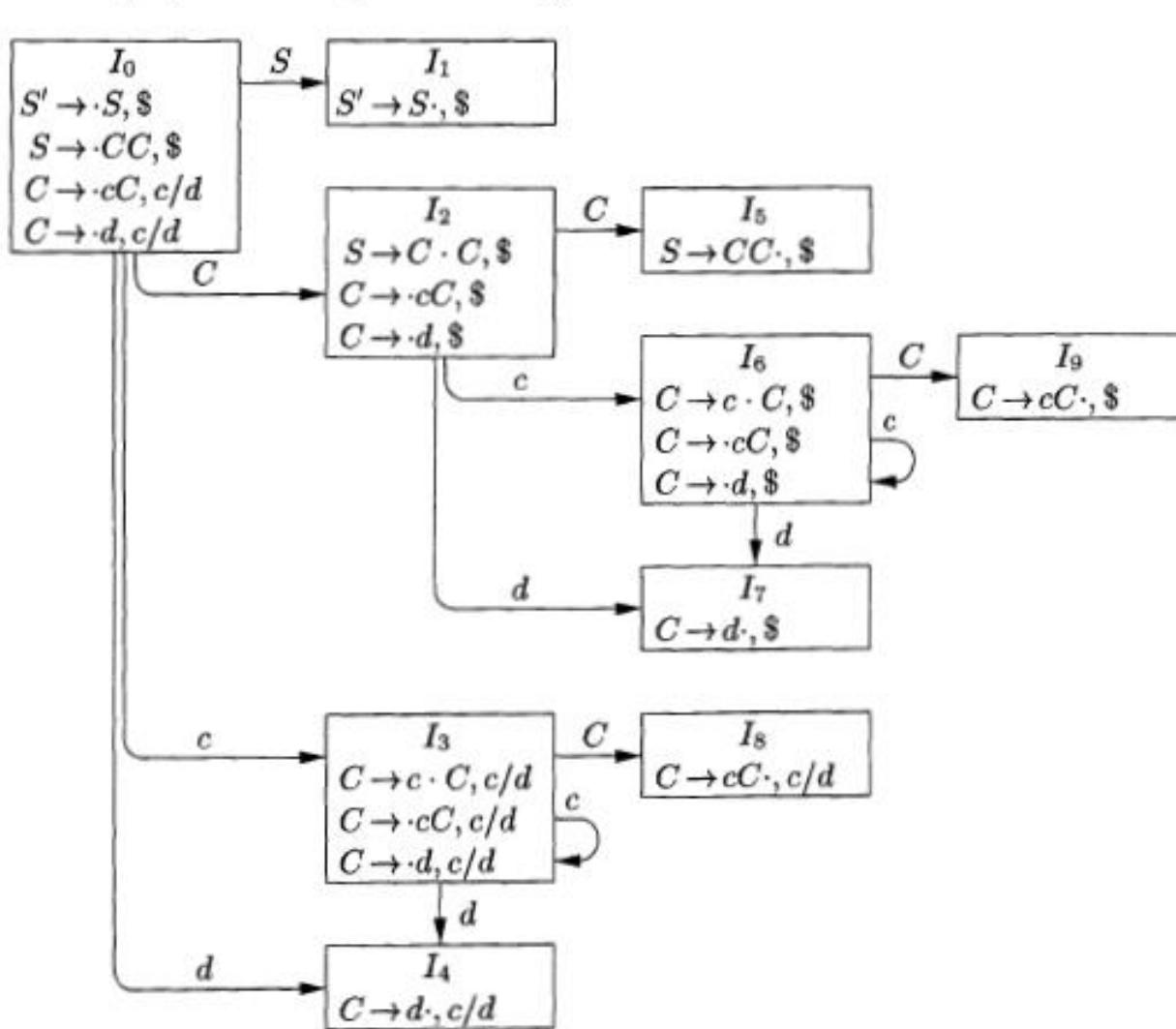
Parse table

State	Input				Goto
	(a)	\$	
0	s2	s3			A
1				accept	1
2	s5	s6			4
3				r2	
4			s7		
5	S5	S6			8
6			r2		
7				r1	
8			s9		
9			r1		

PARSING ACTION

Stack	Symbols	Input	Action
\$0		(a)\$	shift
\$02	(a)\$	Shift
\$026	(a)\$	Reduce A->a
\$024	(A)\$	Shift
\$0247	(A)	\$	Reduce A->(A)
\$0_1	A	\$	accept

$S \rightarrow CC$
 $C \rightarrow cC \mid d$ LR(1) DFA



PARSE TABLE

STATE	ACTION			GOTO	
	c	d	\$	S	C
0	s3	s4	.	1	2
1	.	.	acc	.	.
2	s6	s7	.	5	5
3	s3	s4	.	5	8
4	r3	r3	.	.	.
5	.	.	r1	.	.
6	s6	s7	.	9	.
7	.	.	r3	.	.
8	r2	r2	.	.	.
9	.	.	r2	.	.

PARSING ACTION

Stack	Symbols	Input	Action
\$0		cd\$	Shift
\$03	c	dd\$	shift
\$033	cc	dd\$	shift
\$0334	cd	d\$	reduce C->d
\$03 <u>3</u> 8	cc <u>C</u>	d\$	reduce C->cC
\$03 <u>8</u>	c <u>C</u>	d\$	reduce c->cC
\$0 <u>2</u>	<u>C</u>	d\$	shift
\$02 <u>7</u>	Cd	\$	reduce C->d
\$0 <u>2</u> <u>5</u>	<u>CC</u>	\$	reduce S->CC
\$0 <u>1</u>	S	\$	Accept

SLR(1)

$$S \rightarrow L=R$$

$$S \rightarrow R$$

$$L \rightarrow *R$$

$$L \rightarrow id$$

$$R \rightarrow L$$

$$I_0: S' \rightarrow .S$$

$$S \rightarrow .L=R$$

$$S \rightarrow .R$$

$$L \rightarrow .*R$$

$$L \rightarrow .id$$

$$R \rightarrow .L$$

$$I_1: S' \rightarrow S.$$

$$I_2: S \rightarrow L=.R$$

$$R \rightarrow L.$$

$$I_3: S \rightarrow R.$$

$$I_6: S \rightarrow L=.R$$

$$R \rightarrow .L$$

$$L \rightarrow .*R$$

$$L \rightarrow .id$$

$$I_7: L \rightarrow *R.$$

$$R \rightarrow .L$$

$$L \rightarrow .*R$$

$$L \rightarrow .id$$

$$I_8: R \rightarrow L.$$

Problem

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

= shift 6

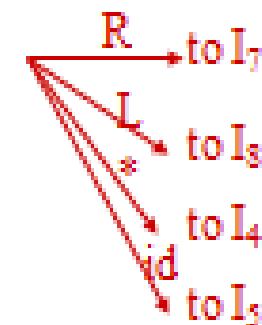
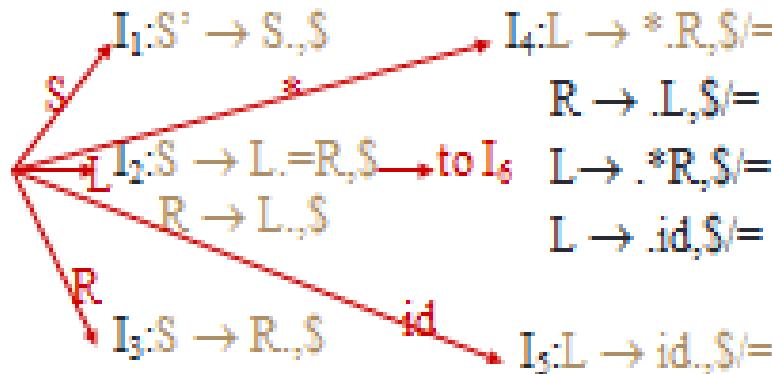
→ reduce by $R \rightarrow L$

shift/reduce conflict

$$I_5: L \rightarrow id.$$

Canonical LR(1) Collection

$S^* \rightarrow S$ $I_0: S^* \rightarrow .S, \$$
 1) $S \rightarrow L = R$ $S \rightarrow L, R, \$$
 2) $S \rightarrow R$ $S \rightarrow .R, \$$
 3) $L \rightarrow *R$ $L \rightarrow .*R, \$/=$
 4) $L \rightarrow id$ $L \rightarrow .id, \$/=$
 5) $R \rightarrow L$ $R \rightarrow .L, \$$



$I_6: S \rightarrow L = R, \$$
 $R \rightarrow L, \$$
 $L \rightarrow .*R, \$$
 $L \rightarrow .id, \$$

$I_7: L \rightarrow *R, \$/=$

$I_8: R \rightarrow L., \$/=$

$I_9: S \rightarrow L = R., \$$

$I_{10}: R \rightarrow L., \$$

$I_{11}: L \rightarrow *R., \$$
 $R \rightarrow L, \$$
 $L \rightarrow .*R, \$$
 $L \rightarrow .id, \$$

$I_{12}: L \rightarrow id., \$$

$I_{13}: L \rightarrow *R., \$$

I_4 and I_{11}

I_5 and I_{12}

I_7 and I_{13}

I_8 and I_{10}

	id	*	=	\$	S	L	R
0	s5	s4			1	2	3
1				acc			
2			s6	r5			
3				r2			
4	s5	s4				8	7
5			r4	r4			
6	s12	s11				10	9
7			r3	r3			
8			r5	r5			
9				r1			
10				r5			
11	s12	s11				10	13
12				r4			
13				r3			

