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Parsing-X

Complete Course on Compiler Design

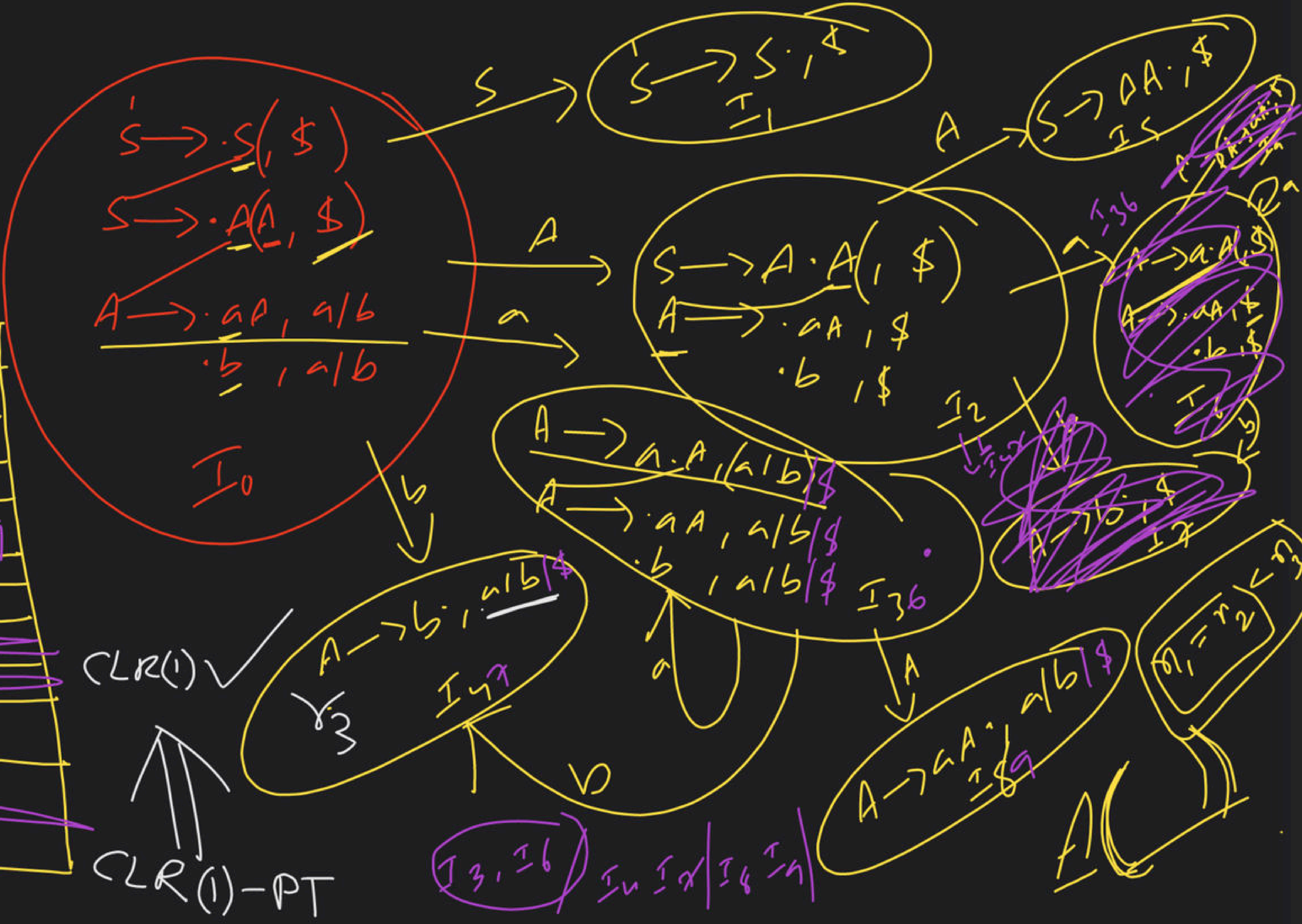
Subbarao Lingamgunta • Lesson 13 • Aug 31, 2023

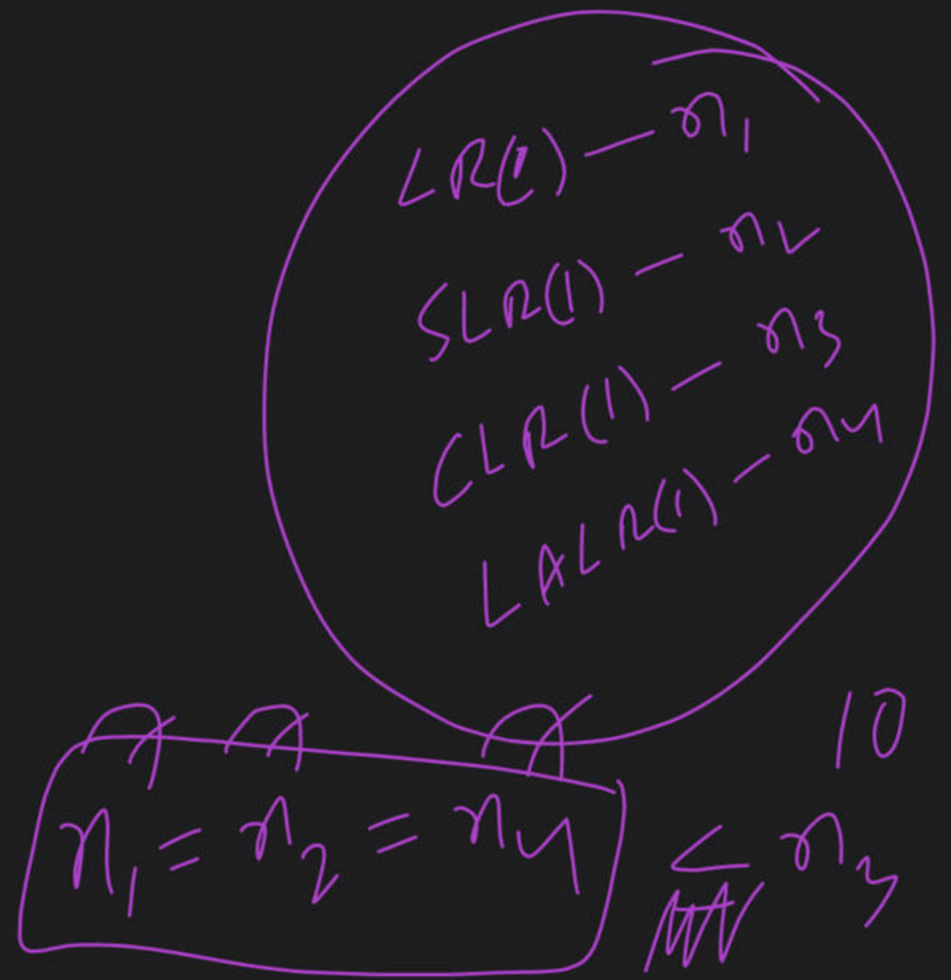
Ex

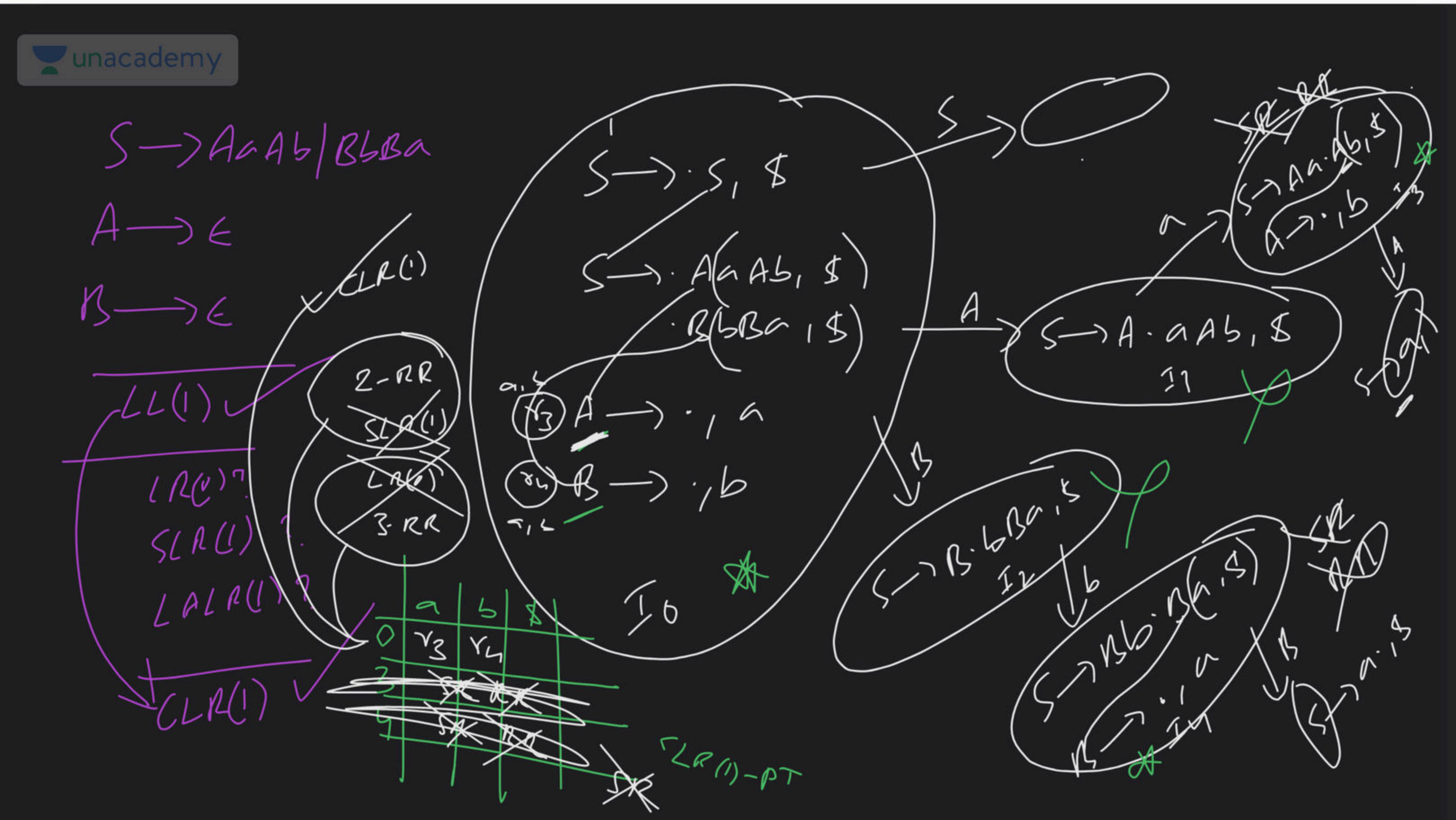
$S \to AA$ (1)

$A \to aA \mid b$ (2, 3)

	action			goto	
	a	b	$	S	A
0	S36	S47		1	2
1			acc		
2	S36	S47			5
36	S36	S47			89
47	r3	r3	r3		
5			r1		
6	S6	S7			9
7			r3		
89	r2	r2	r2		
9					




LR(1) — n_1
SLR(1) — n_2
CLR(1) — n_3
LALR(1) — n_4
$n_1 = n_2 = n_4$
$\leq n_3$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S → AaAb | BbBa
A → ∈
B → ∈
LL(1)
LR(1) ?
SLR(1) ?
LALR(1) ?
CLR(1)
CLR(1)
2-RR
SLR(1)
LALR(1)
3-RR
S → · S, $
S → · A(aAb, $)
· B(bBa, $)
A → ·, a
B → ·, b
I0
S
A
S → A · aAb, $
I1
S → Aa · Ab, $
A → · b
I3
S → B · bBa, $
I2
S → Bb · Ba, $
I4
a
b
$
0
r3
r4
CLR(1)-PT

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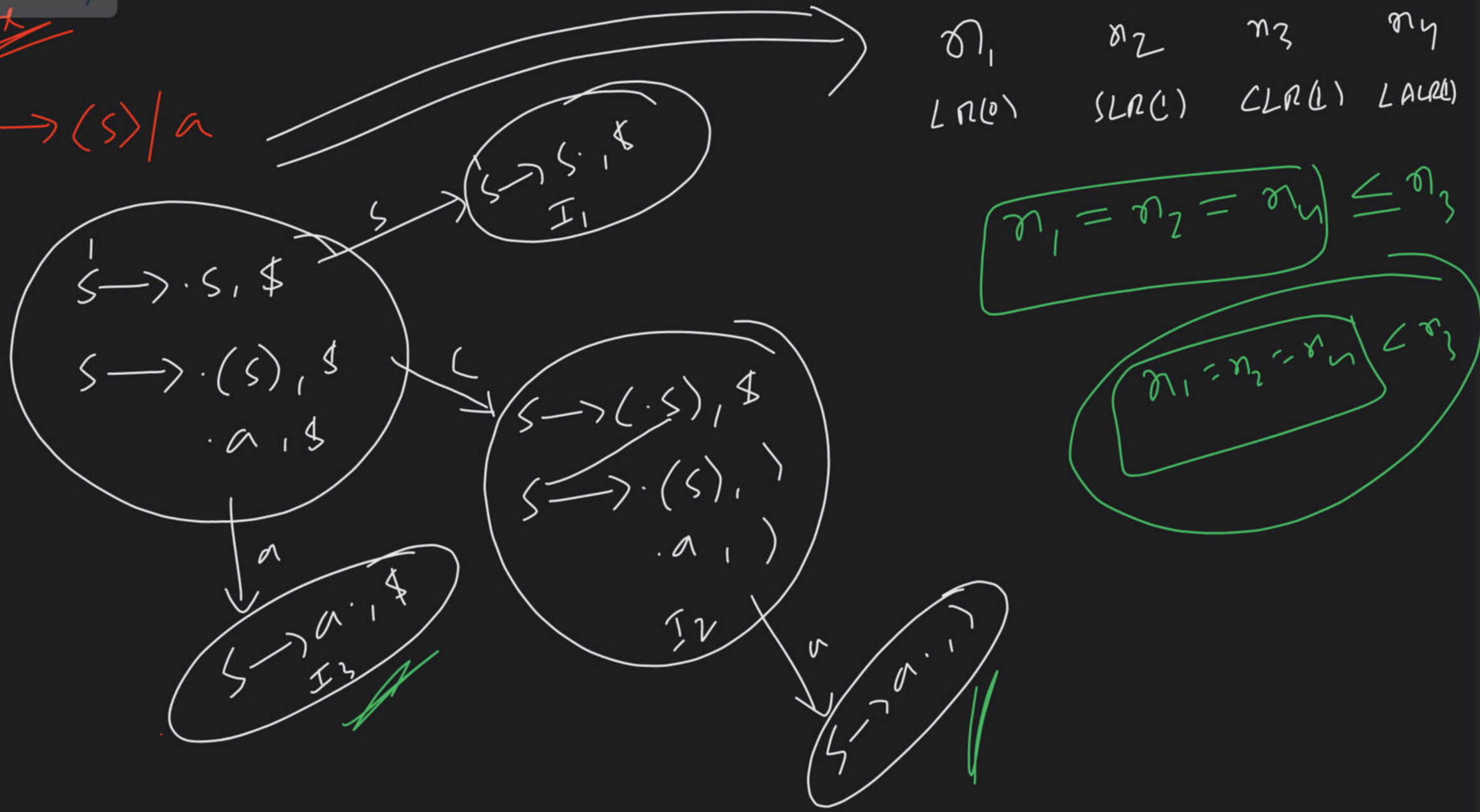
ex

$S \rightarrow (S) \mid a$

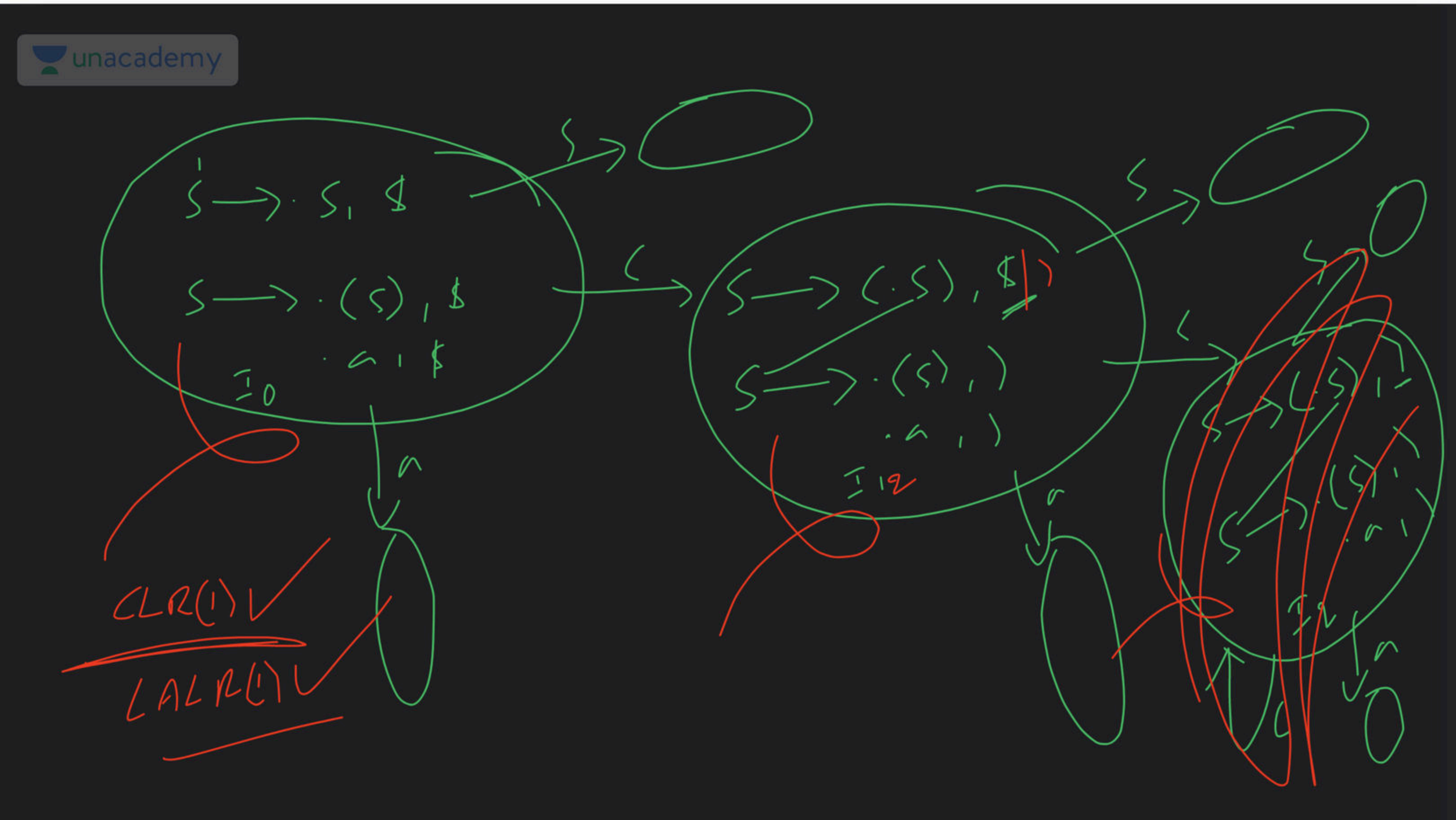


n_1 n_2 n_3 n_4

LR(0) SLR(1) CLR(1) LALR(1)

$n_1 = n_2 = n_4 \leq n_3$

$n_1 = n_2 = n_4 < n_3$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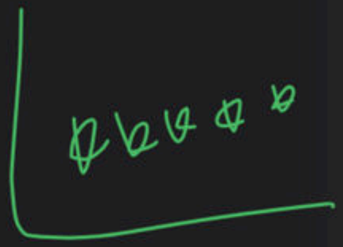
S → · S , $
S → · (S) , $
· a , $
I0
S → (· S) , $
S → · (S) ,)
· a ,)
I12
CLR(1)
LALR(1)



I_5: $1 \cdot A \to c \cdot$, a/b/c
$2 \cdot B \to d \cdot$, d/e/f/.../2

CLR(1)
NO-RR

	a	b	c	d	e	f	...	2
0	r_1	r_1	r_1	r_2	r_2	r_2	...	r_2

I_6: $1 \cdot A \to c \cdot$, d/e/f/g/.../2
$2 \cdot B \to d \cdot$, a/b/c

CLR(1)
NO-RR

	a	b	c	d	e	f	...	2
6	r_2	r_2	r_2	r_1	r_1	r_1	...	r_1

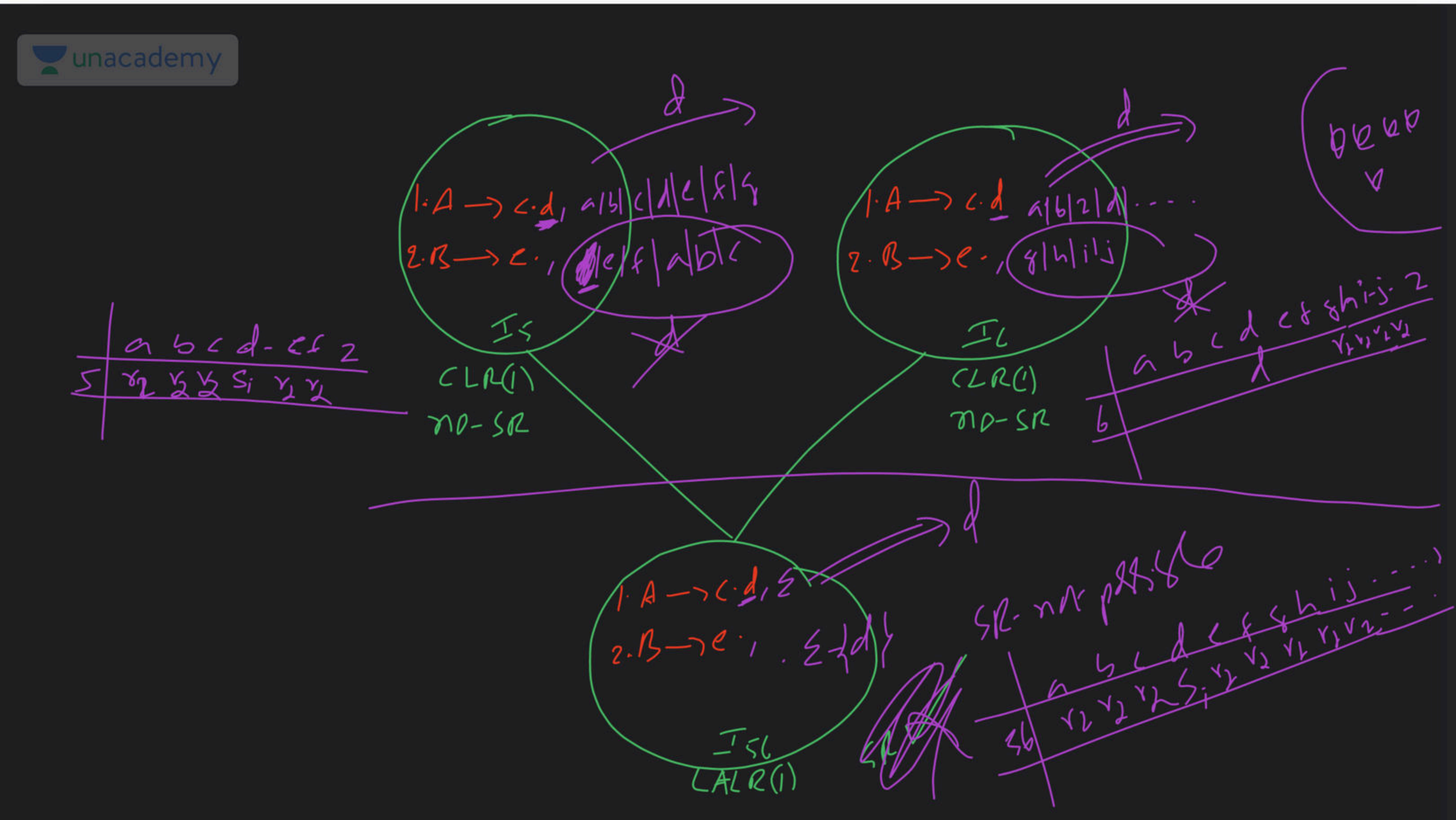
CLR(1) ✓

I_{56}: $1 \cdot A \to c \cdot$, a/b/c/.../2
$2 \cdot B \to d \cdot$, a/b/c/.../7

LALR(1)
RR ✓

	a	b	c	...	2
56	r_1	r_1	r_1		r_1
	r_2	r_2	r_2		r_2

~~LALR(1)~~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d
1. A → c . d, a|b|c|d|e|f|g
2. B → e . , e|f|a|b|c
I5
CLR(1)
non-SR
d
1. A → c . d a|b|2|d ....
2. B → e . , g|h|i|j
I6
CLR(1)
non-SR
b e b
a b c d e f 2
5 r2 r2 r2 S1 r1 r1
a b c d e f g h i-j . 2
6 r1 r1 r1 r1
d
1. A → c . d, $
2. B → e . , $/d
I56
LALR(1)
SR - nil possible
a b c d e f g h i j ....
56 r2 r2 r2 S1 r2 r2 r1 r1 r1 r1 ....