SLR(1) Parser

1. Find the Augment of Grammer (same as previous parser LR(0))

2. Find the LR(0) Collection of item (By Method 1 or Method 2) same as previous parser (LR(0))

3. Construct the SLR(1) Parsing Table (ACTION/GOTO) everything is same as LR(0) parser only differ in the entry of reduce, in LR(0) we Blindly write reduce entry to all productions.

4. Parsing the I/P string By SLR(1) parsing Table

Construction of SLR(1) Parsing Table

Input: Augmented Grammer G'

Output: The SLR parsing Table function ACTION & GOTO for G'

METHOD

1. Construct C = {I₀, I₁, --- Iₙ} LR(0) collection of items for G'.

2. State i is constructed from Iᵢ. The parsing action for state i are determined as follows :-

(a) if $[A \rightarrow \alpha.a\beta]$ is in Iᵢ and and GOTO(Iᵢ, a) = Iⱼ then set ACTION[i, a] to "shift j" Here a must be terminal.

(b) if $(A \rightarrow \alpha.)$ is in Iᵢ, then set ACTION[i, a] to reduce $A \rightarrow \alpha$ for all a in FOLLOW(A); here A may not be S'

(c) if $[S' \rightarrow S.]$ is in Iᵢ, then set ACTION(i, $) to "Accept"

3. The goto transition for state i are constructed for all Non terminal A using the rule: if GOTO(Iᵢ, A) = Iⱼ then GOTO[i, A] = j

4. All entries not defined By rule 2 & rule 3 are made "error"

5. The initial State of the parser is the one constructed from the set of items containing $[S' \rightarrow .S]$

Construct the SLR(1) parsing Table for a given context free
grammar G

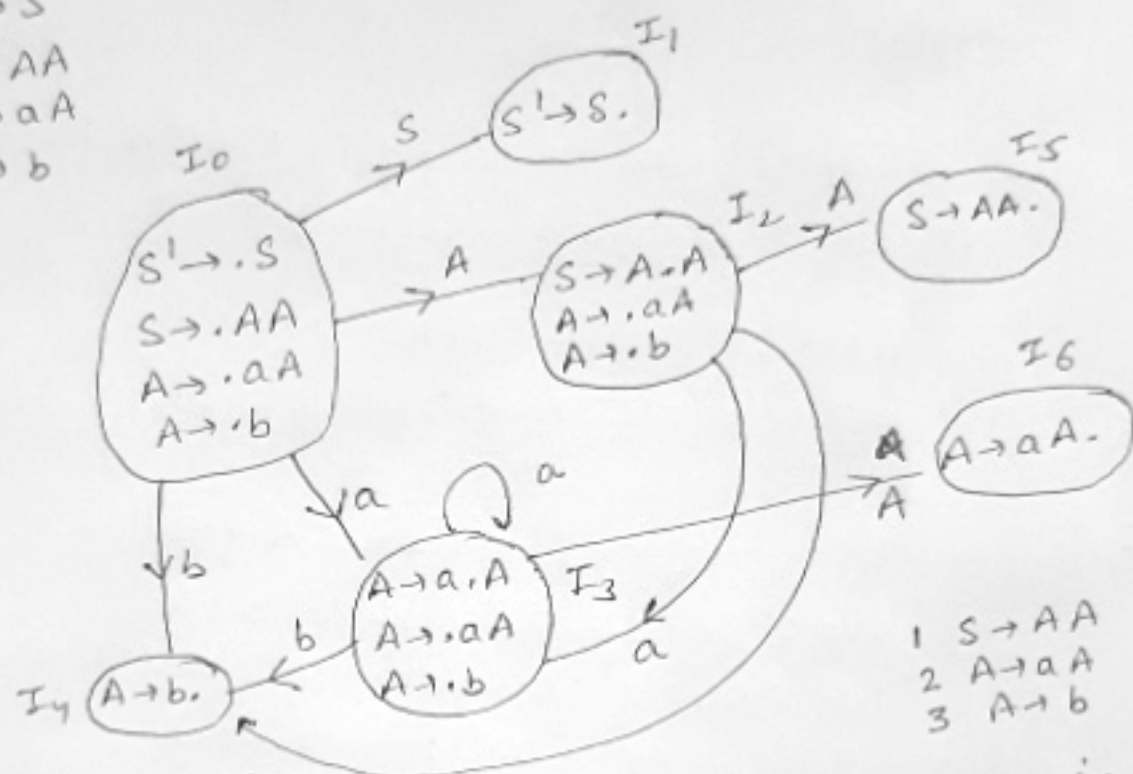$$S \rightarrow AA$$
$$A \rightarrow aA$$
$$A \rightarrow b$$

Sol.^n
To Construct SLR(1) parsing Table -
(1) Find Augmented Grammar G'
(2) Find LR(0) collection of item

G' :
$$S' \rightarrow S$$
$$S \rightarrow AA$$
$$A \rightarrow aA$$
$$A \rightarrow b$$

Here LR(0) :→
Collection is Find
by Method 2
(In the previous
Question
Same is Solved)

1. $S \rightarrow AA$
2. $A \rightarrow aA$
3. $A \rightarrow b$

To do Reduce entry in
SLR(1) parsing Table
State (4,5,6) have Reduced
entry, So there is need to
Find Follow of the production

I_5: $S \rightarrow AA$.
FOLL(S) $\rightarrow \{ \$ \}$
so this is First production
that means r_1 entry in state
[S,$]

I_4: $A \rightarrow b$. FOLL(A)=$\{a,b,\$\}$
so r_3 entry in

I_6: $A \rightarrow aA$.
r_2 entry in FOLL(A)= $\{a,b,\$\}$

	ACTION			GOTO	
	a	b	$	S	A
0	S3	S4		1	2
1			Accept		
2	S3	S4			5
3	S3	S4			6
4	r3	r3	r3		
5			r1		
6	r2	r2	r2		