LALR

$S \to AA$
$A \to aA / b$

Sol Step 1 :- Design of LR(1) Parser

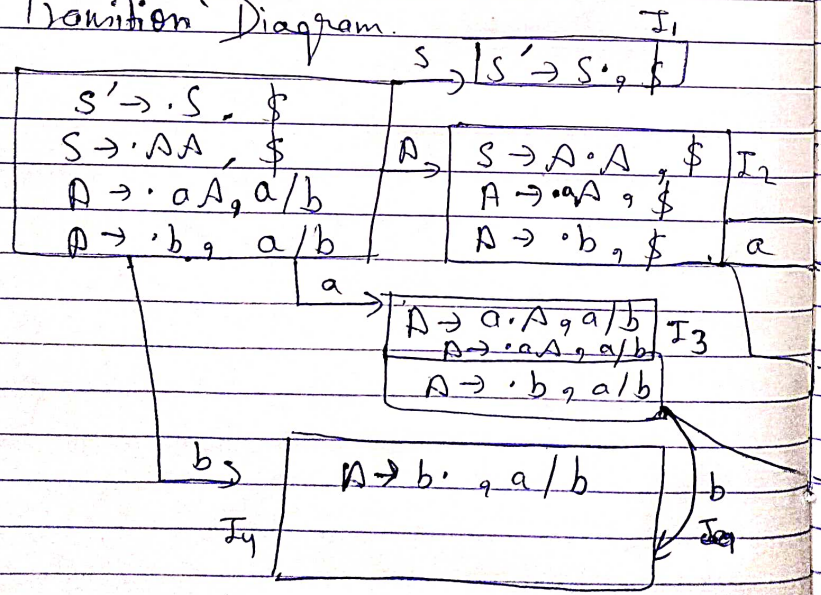
1) Augmented Grammer

$S' \to .S$ — 0
$S \to .AA$ — 1
$A \to .aA$ — 2
$A \to .b$ — 3

2) Calculation of first Set

first(A) = { a, b }
first(S) = { a, b }

3) Transition Diagram



State	Action			Goto	
	a	b	$	S	A
I_0	S_3	S_4		1	2
I_1		Accept	Accept		
I_2	S_6	S_7			5
I_3	S_3	S_4			8
I_4	R_3	R_3			
I_5			R_1		
I_6	S_6	S_7			9
I_7			R_3		
I_8	R_2	R_2			
I_9			R_2		

Table does not contain multiple entries, Hence given grammer is LR(1)

Step 2 Design of LALR

I_{38} → $A \to a \cdot A,\ a/b/\$$
$A \to \cdot aA,\ a/b/\$$
$A \to \cdot b,\ a/b,\$$

I_{47} → $A \to b \cdot,\ a/b/\$$

I_{89} → $A \to aA \cdot,\ a/b/\$$

I_{36} → Same state (Coz 3 and 6)

I_{47} → Same state (Coz 4 & 7)

I_{89} → Same state (Coz 8 & 9)