

6.5

Compiler Construction Quiz-3

1. Given CFG:

$s \rightarrow e$
 $e \rightarrow e+v \mid v$
 $v \rightarrow x \mid y \mid \epsilon$

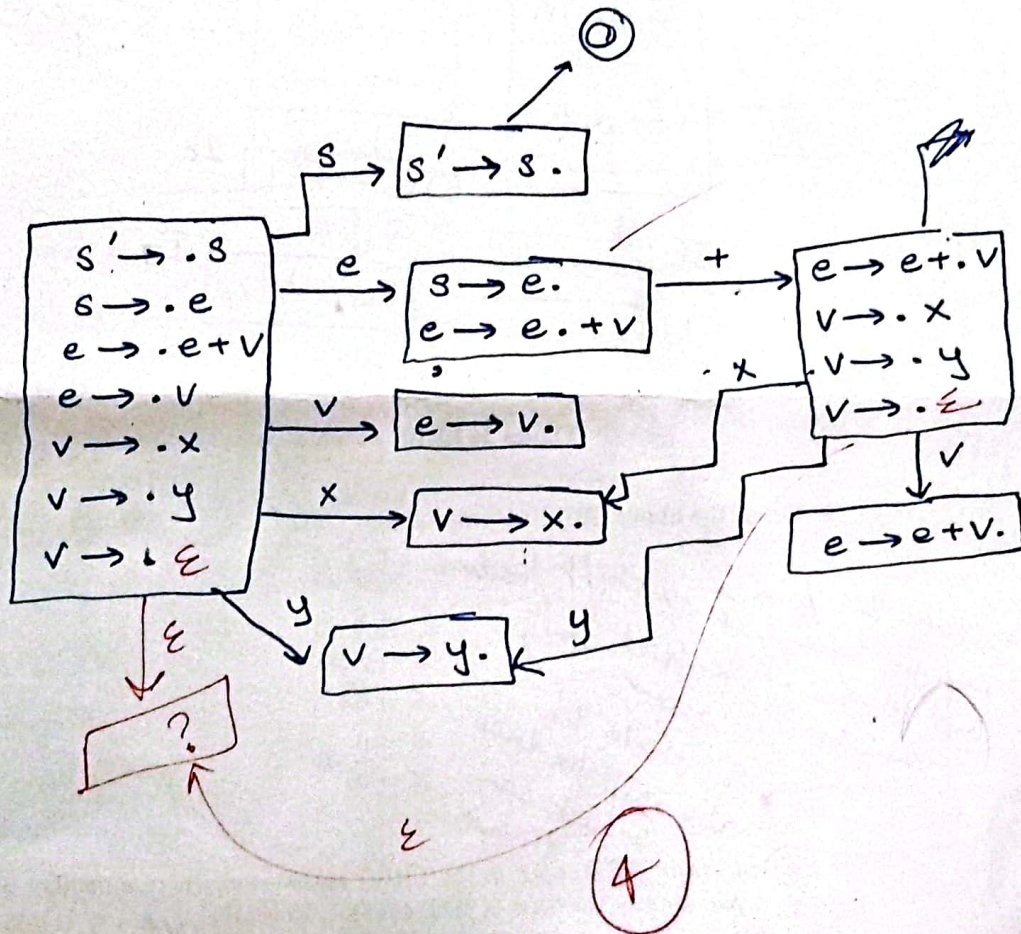
create LR(0) automaton. [5 Marks]

~~CFG~~

$s \rightarrow e$
 $e \rightarrow e+v \mid v$
 $v \rightarrow x \mid y \mid \epsilon$

Augmented
 $s' \rightarrow s$
 $s \rightarrow e$

$e \rightarrow e+v$
 $e \rightarrow v$
 $v \rightarrow x$
 $v \rightarrow y$
 $v \rightarrow \epsilon$



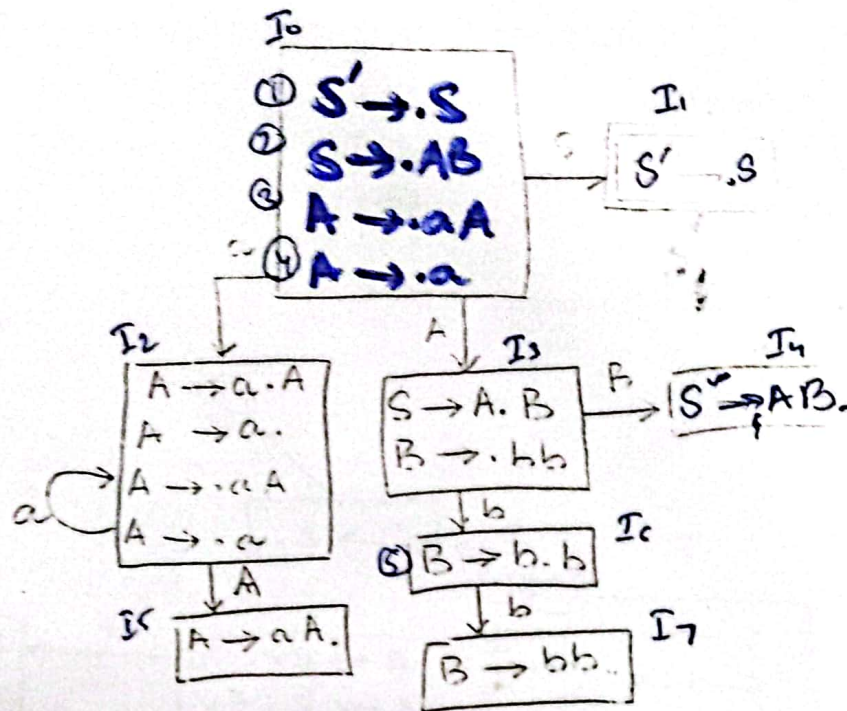


Figure 1: LR(0) automaton

2. Given the above LR(0) automaton and CFG

• In state 2 $A \rightarrow \cdot aA$, shift/reduce conflict can occur.
 • In state 3, also shift/reduce conflict can occur.

$S' \rightarrow S$
 $S \rightarrow AB$
 $A \rightarrow aA$
 $A \rightarrow a$
 $B \rightarrow bb$

- Identify the state(s) in the LR(0) automaton where a conflict arises and specify the type of each conflict. [3 Marks]
- Explain how you can resolve the conflict in $SRL(1)$. After resolution of conflicts specify which actions to be taken on specific input symbols. [4 Marks]

Please write your text clearly in bulleted fashion which is easier to check and has complete information. [3+4=7 Marks]

• Instead of reducing for all terminals, I will reduce for those terminal which included in the follow set of said shifting

Follow(A) = $\{ \epsilon, a \}$
 Follow(B) = $\{ \epsilon, b \}$

①

3. Create parse tree using the grammar of the last question for string *aabb*.
Must clearly show SLR(1) stack's creation and manipulation otherwise
no marks will be given. [7 Marks]

State	Input	Stack	Action
0		cent aabb	Shift 2
02	a	abb	Shift 2
022	aa	bb	
0	a	aabb	Shift 2 ⑤
02	a A	abb\$	Reduce $A \rightarrow a$
024	Aa	abb\$	Shift 2
024	Aa	bb\$	Reduce $A \rightarrow a$ Shift 5
025	Aa	bb\$	Reduce 3
024	A	bb\$	Shift 3
03	Ab	b\$	Shift 6
036	Abb	\$	Reduce $B \rightarrow bb$
03	AB	\$	Reduce $S \rightarrow AB$
03	AS	\$	ACCEPT
01	S		

