



Mansoura University
Faculty of Computers and Information
Sciences
Department of Computer Science
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[CS422p] Compiler Construction

Grade: Fourth grade

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Compiler construction

Syntax Analysis

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Syntax Analysis

Bottom UP Parsing

Bottom Up Parsing

- Bottom Up Shift-Reduce Parsing SLR(1) :
 - I. Augment the grammar.
 - II. Draw DFA using LR(0) items.
 - III. Constructing the parse table.

SLR(1) Parsing – question 1.

Q: Recall Grammar “Dangling else”

Stmt \rightarrow if expr then stmt
 | if expr then stmt else stmt
 | other

Can be written as:

$S \rightarrow iS | iSeS | a$

Find the following :

1. LR(0) items + Goto states (DFA) .
2. SLR parsing table.
3. Prove the grammar is not SLR.

Solution:

Step-1: Augment The Grammar and add LR(0) items:

$S' \rightarrow .S$

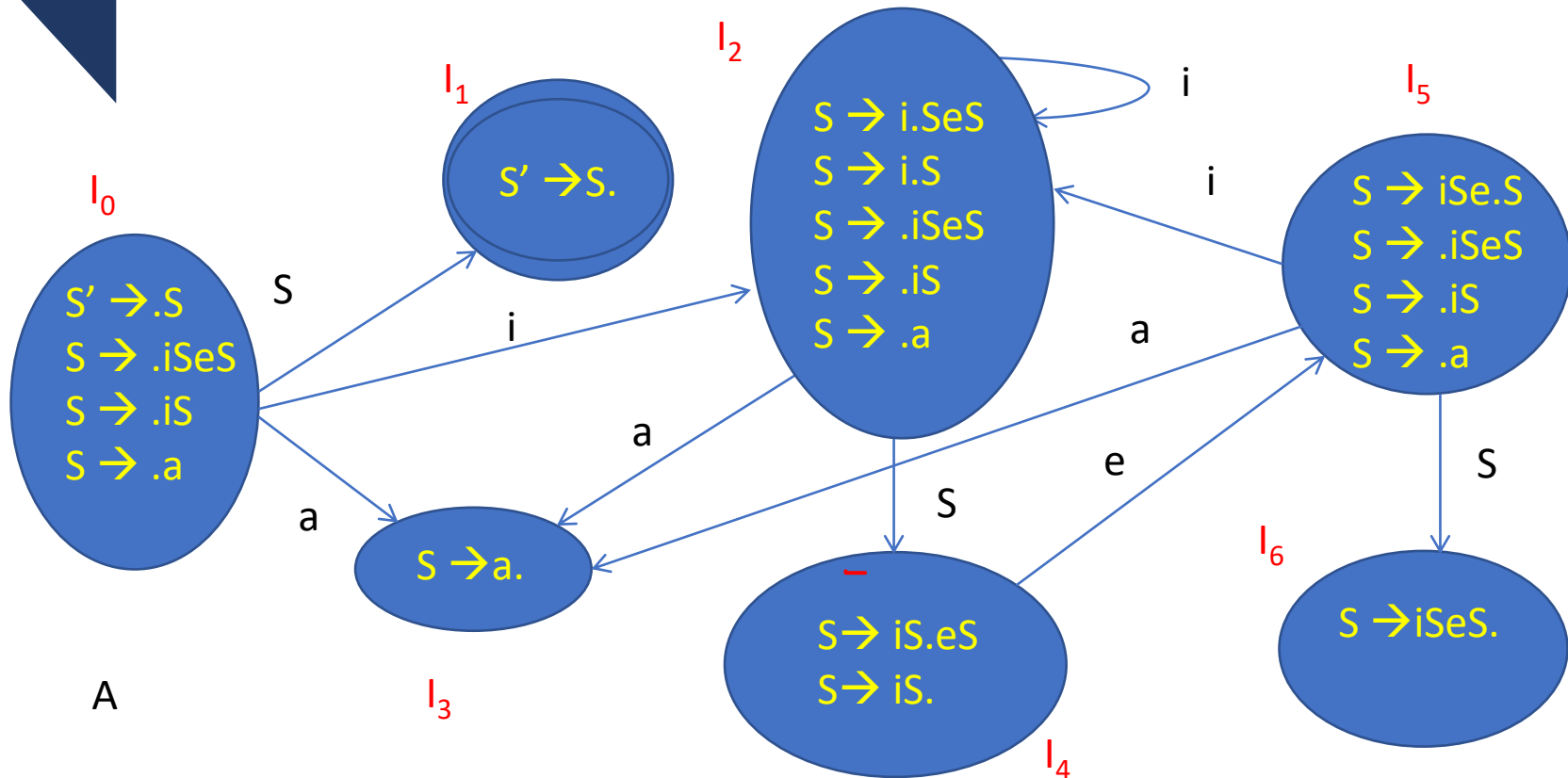
1: $S \rightarrow .iSeS$

2: $S \rightarrow .iS$

3: $S \rightarrow .a$

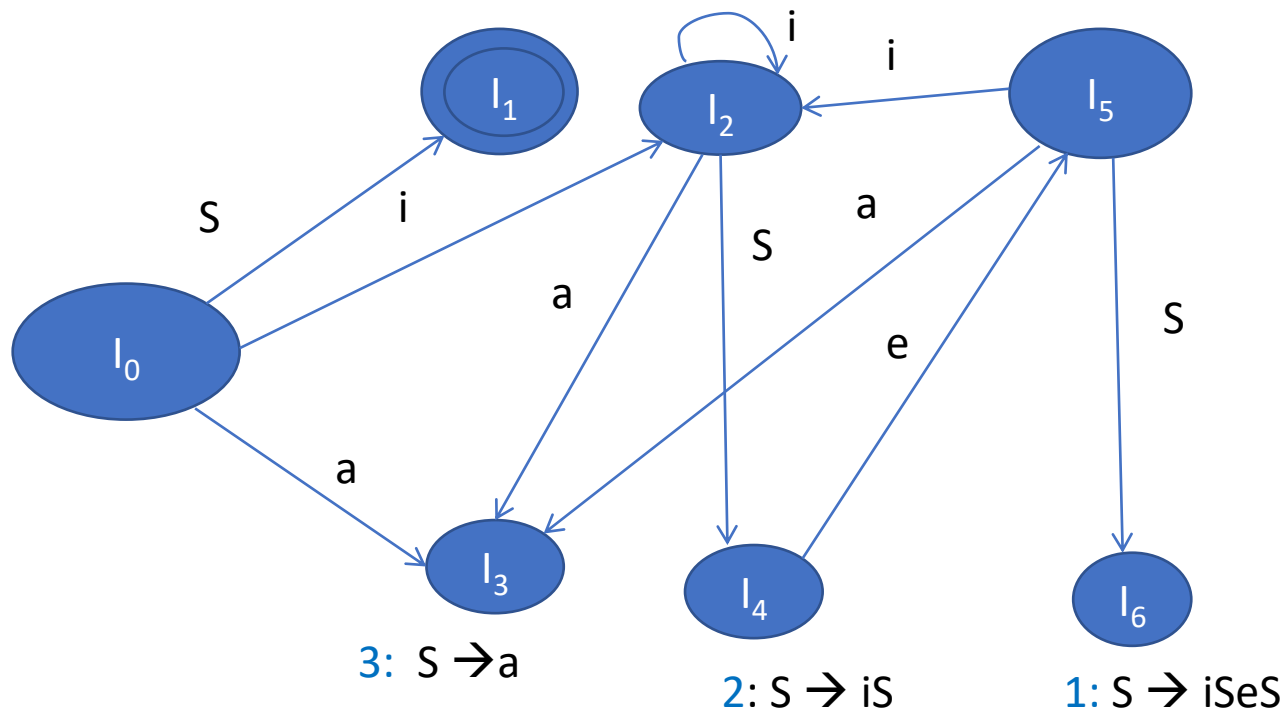
SLR(1) Parsing – question 1.

Step -2 : Draw DFA using LR(0) items .



SLR(1) Parsing – question 1.

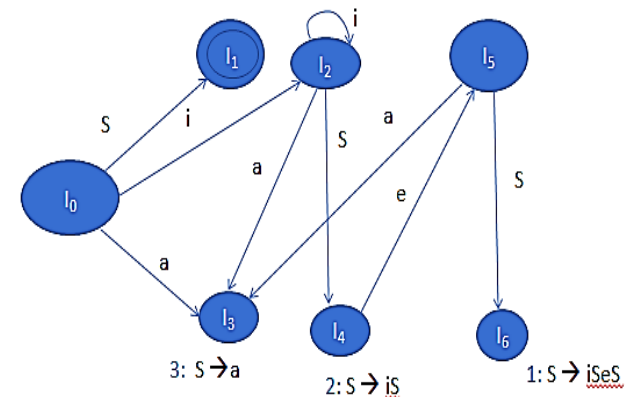
The DFA (Go-To states):



SLR(1) Parsing – question 1.

states	ACTIONS				GO TO
	i	e	a	\$	S
I_0	S2		S3		1
I_1				ACCEPT	
I_2	S2		S3		4
I_3		r3		r3	
I_4		S5/r2		r2	
I_5	S2		S3		6
I_6		r1		r1	

Step -3 : Construct the SLR(1) parsing table .



NOTE : $\text{follow}(S) = \{e, \$\}$

SLR(1) Parsing – question 1.

Since there is a shift–reduce conflict in the row number 4, and column 'e'. Hence the grammar is not SLR.

Bottom UP Parsing – SLR(1)

THANK YOU

SYNTAX ANALYSIS

Thanks