

## Plan for Today

### Building the LR Parsing Table for LR(1)

- First and Follow sets
- building the table

### Debugging shift/reduce and reduce/reduce errors

CS453 Lecture

Building LR(1) Parse Tables

1

## FIRST and FOLLOW sets

### FIRST( $\gamma$ )

- $\gamma$  is a string of terminals and nonterminals
- FIRST( $\gamma$ ) is any terminals that can start a string derived from  $\gamma$

### nullable(X)

- X is a nonterminal
- nullable(X) is true if X can derive the empty string

### FOLLOW( X )

- X is a nonterminal
- FOLLOW(X) is all terminals that can immediately follow X

CS453 Lecture

Building LR(1) Parse Tables

2

## Building the LR Parse Table for LR(1)

(0)  $S \rightarrow E \$$   
 (1)  $E \rightarrow T + E$   
 (2)  $E \rightarrow T$   
 (3)  $T \rightarrow x$

Symbol	FIRST
x	x
+	+
T	x
E	x
S	x

State	Action			Goto	
	x	+	\$	T	E
0	s3			g2	g1
1			accept		
2		s4	r2		
3		r3	r3		
4	s3			g2	g5
5			r1		

CS453 Lecture

Building LR(1) Parse Tables

3