

FILS

Course: Compiler Techniques

Homework #5 Bottom-Up Parsing

1. Consider the grammar :

$$S \rightarrow SS + \mid SS * \mid a$$

Construct the canonical LR(0), LR(1) and LALR sets of items for this grammar.

2. Show that the following grammar:

$$S \rightarrow SA \mid A$$

$$A \rightarrow a$$

is SLR(1) but not LL(1).

3. Consider the following augmented grammar.

$$S' \rightarrow S$$

$$S \rightarrow CC$$

$$C \rightarrow cC \mid d$$

Verify if the grammar is LR(1) ? But SLR(1)? But LR(0)?

4. Consider the following ambiguous grammar for conditional statements:

$$stmt \rightarrow \mathbf{if\ expr\ then\ stmt\ else\ stmt}$$

$$\mid \mathbf{if\ expr\ then\ stmt}$$

$$\mid \mathbf{a}$$

Let simplify it like the following grammar:

$$S \rightarrow \mathbf{i\ S\ e\ S\ \mid\ i\ S\ \mid\ a}$$

a) Construct the set of LR(0) states for the augmented grammar.

b) Fix the conflicts and simulate the parsing actions with a table like this:

STACK	SYMBOLS	INPUT	ACTION
0		iaea\$	shift
1			

c) Use the Yacc ("yet another compiler-compiler"- <http://www.scribd.com/doc/8669780/Lex-yacc-Tutorial>) to generate the LALR tables of this grammar.