

COP5621 Fall 2011 – Extra Credit Homework 2

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1. Consider the grammar:

$$\begin{aligned} A &\rightarrow A A \mid B \mathbf{a} \\ B &\rightarrow A \mathbf{b} \mid C C \\ C &\rightarrow B \mid \mathbf{c} \end{aligned}$$

- Eliminate mutual left recursion (using the most general algorithm discussed in class in Ch.4 part I).
- Prove that the modified grammar is still not LL(1) by constructing an LL(1) parsing table. Indicate the conflicts in the table.

2. Consider the grammar augmented with a new start symbol S' and production $S' \rightarrow S$:

$$\begin{aligned} (0) \quad S' &\rightarrow S \\ (1) \quad S &\rightarrow A B C \\ (2) \quad A &\rightarrow \mathbf{a} A \\ (3) \quad A &\rightarrow B \\ (4) \quad B &\rightarrow \mathbf{b} \\ (5) \quad C &\rightarrow \mathbf{c} \\ (6) \quad C &\rightarrow \varepsilon \end{aligned}$$

- Construct the LR(0) sets of items.
- Construct the SLR parsing table from the LR(0) items.
- Is the grammar LR(0)? Is it SLR?

3. Consider the grammar:

$$\begin{aligned} A &\rightarrow C \mathbf{a} B \mathbf{a} \\ A &\rightarrow B \\ B &\rightarrow C \\ C &\rightarrow \mathbf{b} \end{aligned}$$

- Add a new start symbol S and production $S \rightarrow A$.
- Construct the LR(1) sets of items.
- Construct the LR(1) parsing table.