

## Formal Languages and Automata Theory Homework #5

Virtually all of the exercises from Chapter 5 of the text are relevant. I would recommend you give as many as you can a try. Similarly, a CFG could be developed for any of the languages from any of the previous homework assignments. So you should try some of those as well. Exercises to be handed in include the following.

1) Give a CFG for each of the following languages:

- a)  $1^*01^*(0+1)^*$
- b)  $\{a^i b^j c^k \mid i \neq j \text{ or } j \neq k\}$
- c) The set of all strings of a's and b's not of the form  $ww$ .

Now consider the following grammar, which generates strings of the form  $0^*1(0+1)^*$  :

$S \rightarrow A1B$   
 $A \rightarrow 0A \mid \epsilon$   
 $B \rightarrow 0B \mid 1B \mid \epsilon$

2) Give leftmost and rightmost derivations for each of the following strings:

- a) 1001
- b) 00011

3) Give parse trees for each of the strings from #2.