

**Due: Tuesday, March 20**  
**40 points**

This homework is to be submitted at the beginning of class.

On homework, you may discuss with other students in the course about how to solve a problem, but the write-up should be your own. You **must include the names** of any students you consulted with. Give credit where credit is due. You may use JFLAP to check your answers for this assignment, but it must be written up and turned in.

All the problems listed below are from the JFLAP book.

1. (4 pts) Chap 7, Problem 1.b. Give the equivalent CFG without  $\lambda$ .
2. (4 pts) Chap 7, Problem 2.c. Give the VDG and the equivalent CFG without unit productions.
3. (4 pts) Chap 7, Problem 3.e. Give the VDG and equivalent CFG without useless productions.
4. (4 pts) Chap 7, Problem 4.b. Give the equivalent CFG in CNF.
5. (5 pts) Chap 8, Problem 6.a. Give the NPDA.
6. (8 pts) Chap 8, Problem 7.c. Give the FIRST and FOLLOW sets for the variables in the grammar, the DFA with item sets and the SLR(1) Parse table.
7. (8 pts) Chap 8, Problem 8.b. Give the FIRST and FOLLOW sets for the variables in the grammar, the DFA with item sets and the SLR(1) Parse table with all the conflicts listed. Then list the selection of conflicts so the string can be parsed.
8. (3 pts) Chap 8, Problem 10. Note that the filename should be ex8.5lrcompare and the string is correct but the description of the string should be:  $a^{12}c^4b^4$ .