CS 475/575 Exam 2 Fall 2012 Study guide

Be prepared to answer these kinds of questions:

- Given a (possibly ambiguous) context-free grammar, draw each distinct parse tree for a given input string.
- Given a (possibly ambiguous) context-free grammar, write each leftmost derivation and each rightmost derivation for a given input string.
- Given a context-free grammar, determine all generated strings with specified length N.
- Write a context-free grammar that generates a given language. Make it unambiguous if possible.
- Given a language and a grammar, does the given grammar generate the given language? Justify your answer.
- Given a grammar, write a simple description for the language that it generates. Justify your answer.
- Given a pushdown automaton, write an accepting computation sequence for a given input string.
- Given a pushdown automaton, determine all accepted strings with specified length N.
- Draw a pushdown automaton for a given language. Make it deterministic if possible.
- Given a pushdown automaton, determine what language it accepts, and write an equivalent context-free grammar.
- Given a context-free grammar, determine what language it generates, and draw an equivalent pushdown automaton.
- Given a context-free grammar, remove its useless symbols, and eliminate ε-productions and unit productions. Also convert the grammar to Chomsky normal form.
- Apply the pumping theorem to prove that a given language is not context-free.
- Determine whether or not the set of context-free languages is closed over a given operation.
- Given a Chomsky normal form grammar and an input string, trace the CYK dynamic programming algorithm.