CS 451 F01 Automata and Formal Languages, Spring 2007

Quiz 4 Solutions

Quiz 4 was given in class on Monday, March 5, 2007.

1. [5 pts] Briefly explain **Chomsky Normal Form**. That is, either describe what it is, or else indicate what it is useful for.

Chomsky normal form is a property that a context-free grammar may have. A CFG is said to be in *Chomsky normal form* if the following are both true.

1. Every production in the grammar is of one of the following forms:

   $A \rightarrow BC$
   $A \rightarrow a$

   where A, B, and C are variables, and a is a terminal.

2. Every symbol is used in the derivation of some string of terminals from the start symbol.

Chomsky Normal Form is useful because grammars in C.N.F. are easier to deal with than more general CFGs. For example, there exist efficient algorithms for determining whether a string can be derived using a given grammar, if that grammar is in C.N.F.