Math 387

Homework 9

Due Friday, November 13

Practice exercises from the book
8.20, 8.21, 8.22, 8.27

Problems

1. Let $A$ be the language of properly-nested parentheses. For example, $A$ contains $(())$ and $(()())$ but not $())()$. Show that $A$ is in $L$.

2. Recall that $A_{NFA} = \{ < M, w > \mid$ such that $M$ is an NFA that accepts $w \}$. Show that this language is NL-complete.

3. Recall that $E_{DFA} = \{ < M > \mid$ such that $M$ is an DFA that accepts no strings $\}$. Show that this language is NL-complete.

Bonus problems

1. Let $B$ be the language of properly nested parentheses and brackets. For example, $[[(()][[]]]$ is in $B$ but $([[]]$ is not. Show that $B$ is in $L$.

2. Let 2SAT be the language of satisfiable boolean formulas written in conjunctive normal form with 2 variables per clause. (This is the same as 3SAT but with smaller clauses. However, unlike with 3SAT, not all formulas can be reduced to a formula of this form.) Show that 2SAT is NL-complete.