Homework Set #6

Assigned: Tuesday, 4/21                  Due: Thursday, 4/30

This assignment covers textbook material in Chapter 4.
Note: Refer to course web site for homework policies.
Remember to attach signed honor statement.

1. (25 points) Textbook Exercise 4.4 on p. 211.

2. (25 points) Textbook Exercise 4.8 on p. 211.

3. (10 points) Consider the regular expression: \( B = ( (c^* a) \cup b )^* \) for \( \Sigma = \{ a, b, c \} \).
   a. Is \( < B, cc > \in A_{\text{REX}} \)? Explain.
   b. Is \( < B, bbcab > \in A_{\text{REX}} \)? Explain.

4. (25 points) Let \( \text{ALL}_{\text{NFA}} = \{ < A > | A \text{ is an NFA and } L(A) = \Sigma^* \} \). Prove that \( \text{ALL}_{\text{NFA}} \) is Turing-decidable.

5. (15 points) Answer TRUE or FALSE for the following statement, and explain your reason:
   Let \( L_i \) be a language such that \( \bar{L}_i \notin \Sigma_i \). Then it is possible that \( L_i \in \Sigma_0 \).