1. Give regular expressions for the following languages:

   (a) $\{w \in \{0, 1\}^* | w$ contains at least three 0’s\} Note: The 0’s do not have to be consecutive.

   (b) $\{w \in \{0, 1\}^* |$ every 0 in $w$ is immediately followed by a 1\}.

   (c) $\{w \in \{0, 1\}^* | w$ does not contain 00\}.

   (d) $\{w \in \{a, b\}^* | w$ contains bab and ends with an a\}.

   (e) $\{w \in \{0, 1\}^* | w$ has the same number of 0’s and 1’s and every prefix of $w$ either has the same number of 0’s and 1’s or has one more 0 than 1 or has one more 1 than 0\}.

2. Convert the NFA in Exercise 1.16b into a regular expression using the method from class (which is the same as the method in the book, and is not the same as the method in JFLAP).

3. Convert the regular expression $(a^* \cup b)(bc)^*$ into an NFA using the method from class (which is the same as the method from the book and is different from the method in JFLAP).

4. Problem 1.31.

5. Problem 1.40b.

   [This problem is harder. Start with a DFA for $A$ and modify it to get a DFA for $NOEXTEND(A)$ by changing the accept states.]