Due February 3

1. Give DFAs that recognize the following languages
   (a) \( \{ w \in \{0,1\}^* \mid w \text{ contains 11}\} \).
   (b) \( \{ w \in \{0,1\}^* \mid w \text{ contains at least two 0's}\} \).
   (c) \( \{11, 101\}^* \).

2. Using the complementation construction and one of the DFAs from Exercise 1, give a DFA that recognizes the language
   \( \{ w \in \{0,1\}^* \mid w \text{ does not contain 11}\} \).

3. Using the union construction and two of the DFAs from Exercise 1, give a DFA that recognizes the language
   \( \{ w \in \{0,1\}^* \mid w \text{ contains 11 or } w \text{ contains at least two 0's}\} \).

4. Using the intersection construction and two of the DFAs from Exercise 1, give a DFA that recognizes the language
   \( \{ w \in \{0,1\}^* \mid w \text{ contains 11 and } w \text{ contains at least two 0's}\} \).

5. Problem 1.34.