Due February 6

1. Give DFAs that recognize the following languages
   (a) \( \{ w \in \{0,1\}^* | w \text{exactly three 1's} \} \).
   (b) \( \{ w \in \{0,1\}^* | w \text{contains 001 as a substring} \} \).
   (c) \( \{11,110\}^* \).

2. Using the complementation construction and one of the DFAs from Exercise 1, give a DFA that recognizes the language
   \( \{ w \in \{0,1\}^* | w \text{does not contain 001 as a substring} \} \).

3. Let \( L = \{ w \in \{0,1\}^* | w \text{ends with a 0 or has even length} \} \). Starting with DFAs for two simpler languages, use the union construction to give a DFA that recognizes \( L \).