On homework, you may discuss with other students in the course about how to solve a problem, but the write-up should be your own. You must include the names of any students you consulted with. Give credit where credit is due.

1. (4 pts) Convert the following DFA into a DFA with the fewest number of states using the algorithm discussed in class. Show the tree distinguishing the states and explain at each level the reason for distinguishing the states. Show the resulting minimal DFA (by showing the transition diagram). You can use JFLAP to check your answer but this must be turned in on paper.

2. (4 pts) Convert the following DFA into a DFA with the fewest number of states using the algorithm discussed in class. Show the tree distinguishing the states and explain at each level the reason for distinguishing the states. Show the resulting minimal DFA (by showing the transition diagram). You can use JFLAP to check your answer but this must be turned in on paper.
3. (3 pts) Give a regular expression that is equivalent to the DFA below.

4. (3 pts) Give a regular expression that is equivalent to the NFA below.
5. (4 pts) Construct a regular grammar for the following DFA.

6. (9) Construct a regular grammar for each of the following languages.

   (a) \( L = a^*ba^*b(aa)^* \)

   (b) \( L = \{ w \in \Sigma^* \mid (n_a(w) - n_b(w)) \mod 3 = 1 \} \), where \( n_a(w) \) is the number of a’s in \( w \).

   (c) \( L = \{ a^n b^m c^p \mid n > 2, m \text{ is even }, p \text{ is odd } \} \)