1. Using the alphabet $\Sigma = \{a, b\}$. Draw an NFA that accepts strings that begin and end with the same character. Assume $\lambda$, $a$, and $b$ are not accepted.

2. Given the language $L = \{a^{2i}b^{2j+1} : i \geq 1, j \geq 0\}$

   (a) Mark each of the following strings as Accepted (A) if it is in $L$, or Not accepted (N) if it is not.
   
   - ______ $\lambda$
   - ______ $b$
   - ______ aabbb
   - ______ aabbb
   - ______ aaaa
   - ______ aab

   (b) Draw a DFA or NFA that accepts the language.

3. Consider the language on $\{0, 1\}^*$ that contains strings that do not end in 01. The DFAs below are incorrect. Give an example string for each DFA that shows the DFA is not correct. Note: You can use different counterexample strings for each DFA, you don’t have to find one string that is a counterexample to both.

   (a) Attempt #1: Use Figure 1.

   Counterexample string: __________

   (b) Attempt #2: Use Figure 2.

   Counterexample string: __________

   (c) Give a correct DFA for the language.

4. Consider the NFA in Figure 3:

   (a) Give two syntactic reasons why the above FA is an NFA.

   (b) Convert the NFA to a DFA. Show your work (e.g. the $\delta^*$ values) and draw the DFA.