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. (8 pts) Convert the following NFA into equivalent DFA using the algorithm discussed in class. You can use JFLAP to check your answer for the first one using the NFA to DFA conversion, but can't use JFLAP for the second one (there is a bug in JFLAP so it doesn’t work correctly if there are εs, sorry)

You should label states indicating which states they represent from the original (you might have a state labeled q0,q1,q2) and do not reduce the number of states.

![Diagram A](image1)

![Diagram B](image2)

2. (3 pts) Consider the following nfa. Give an equivalent regular expression.

![Diagram C](image3)
3. (4 pts) Define $\text{Suf}(L) = \{w \in \Sigma^* \mid x = yw \text{ for some } x \in L, y \in \Sigma^*\}$ (the set of suffixes of $L$)

Prove that $\text{Suf}(L)$ is closed under the regular languages. (Hint: Given a DFA for $L$, construct a DFA for $\text{Suf}(L)$.)

4. (4 pts) Define $L^R = \{w^R \mid w \in L\}$

Prove that $L^R$ is closed under the regular languages.

5. (3 pts) Give a regular grammar for the following DFA.

![DFA Diagram]

6. (6 pts) Construct a regular grammar for the following languages.

   (a) $L = \{a^n b^m c^p \mid n \text{ and } p \text{ are even and } m \text{ is odd}\}$

   (b) $L = \{w \in \Sigma^* \mid w \text{ has an even number of } a's \text{ and an odd number of } b's\}$

   Note that $abbaaba \in L$. 