1. Write a regular expression that describes set $\{w \in \{a, b, c\}^* \mid w$ contains $ccbc$ as a contiguous substring} For example, it should generate $abccbc$ but not $acbaccb$. Use the regular expression notation defined in class.

2. Write a regular expression that describes the set $\{w \in \{a, b, c\}^* \mid$ the length of $w$ is at least 2 and most 4}. Use the regular expression notation defined in class. The length of your regular expression must be no more than 100 total characters. (Don’t take that as a suggestion that you need that many characters. You don’t.)
3. Draw a state transition diagram of an NFA with 4 states that recognizes language \( A = \{w \in \{a, b\}^* \mid w \text{ ends on ay}z \text{ for some symbols } y \in \{a, b\} \text{ and } z \in \{a, b\}\} \). That is, a string \( w \) is in \( A \) if the third symbol from the end of \( w \) is \( a \). Do not use \( \epsilon \)-transitions. Number the states.

4. Convert the NFA that you got in the preceding question into a DFA using the subset construction. Label each state of the DFA by the set of NFA states that it corresponds to in the subset construction.