
The answers must be the original work of the author. While discussion with others is permitted and encouraged, the final work should be done individually. You are not allowed to work in groups. You are allowed to build on the material supplied in the class. Any other source must be specified clearly.

1. (60 points) Build a DFA that accepts the described language. Explain how the machine works.

Part a. The set of strings over $\{a, b, c\}$ in which every b is immediately followed by at least one c .

Part b. $(ab)^*ba$

Part c. $\{w \mid w \in \{a, b\}^* \text{ and the length of } w \text{ is at least } 5 \}$

2. (40 points) Use Theorem 5.5.3 and Example 6.1.1 to convert the regular expression $(ab)^*(a \cup b \cup c)^*$ into an NFA- λ . Apply the full steps and do not simplify the machine. Do not construct the machine directly.