Assignment 3

1. Find a DFA that accepts the language defined by the following NFA

2. Find an NFA with four states for \( L = \{a^n : n \geq 0\} \cup \{b^n a : n \geq 1\} \)

3. What is the complement of the language accepted by the NFA in the following figure

4. Prove that for every NFA with an arbitrary number of final states, there is an equivalent NFA with only one final state. Can we make a similar claim for DFA’s?

5. Find a regular expression for language \( L = \{vwv : v, w \in \{a, b\}^*, |v| = 2\} \)

6. Give a regular expression for language \( L = \{a^n b^m, n \geq 1, m \geq 1, mn \geq 3\} \)

7. Give a regular expression for \( L^R \), where \( L = (a+b)^* b(a+ab)^* \)