Finite Automata Homework 2

Due: Thursday, Sep 17
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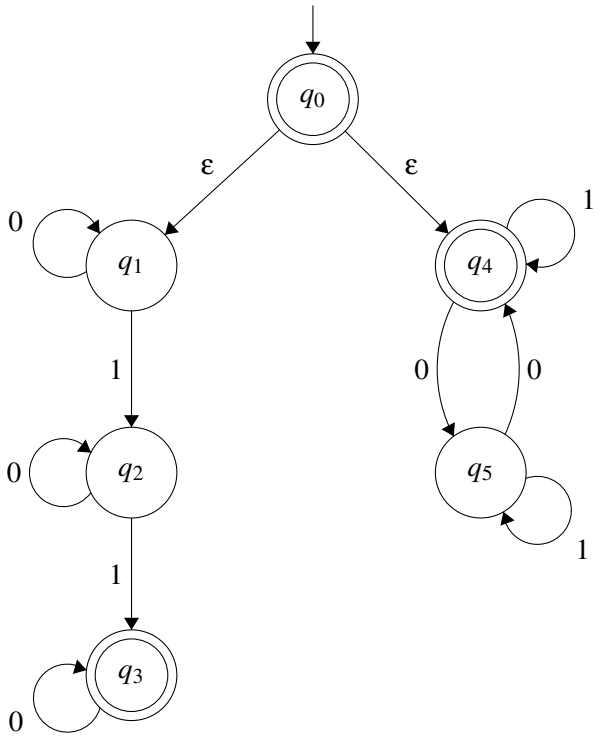
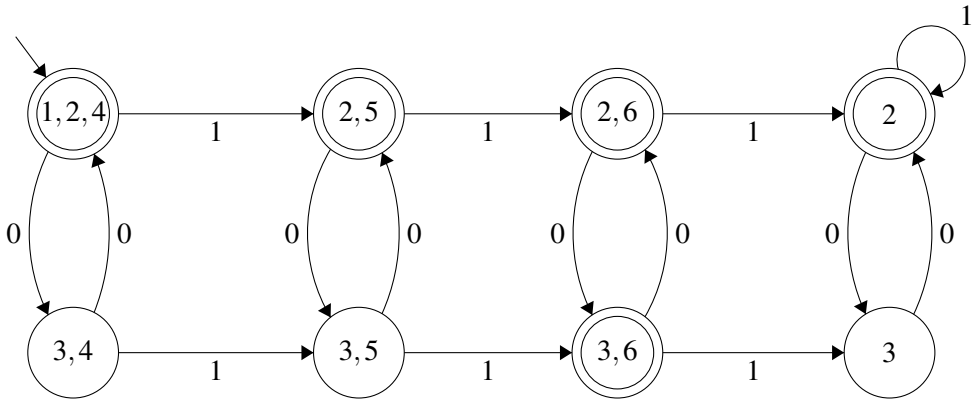
1. Below is an NFA with six states that accepts the language

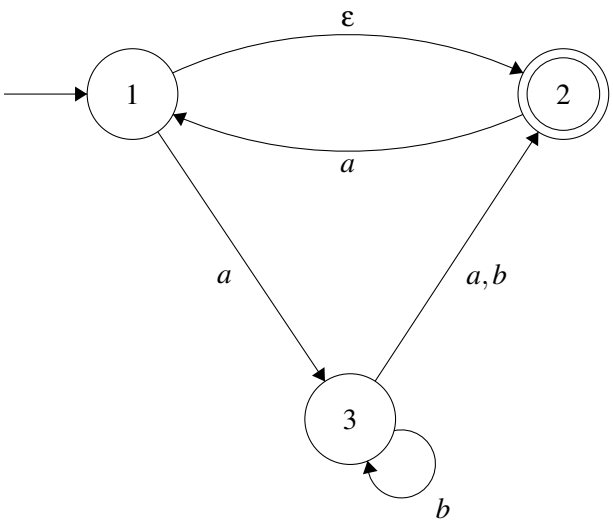
   $L = \{\ w \mid w$ contains an even number of 0s, or contains exactly two 1s $\}$



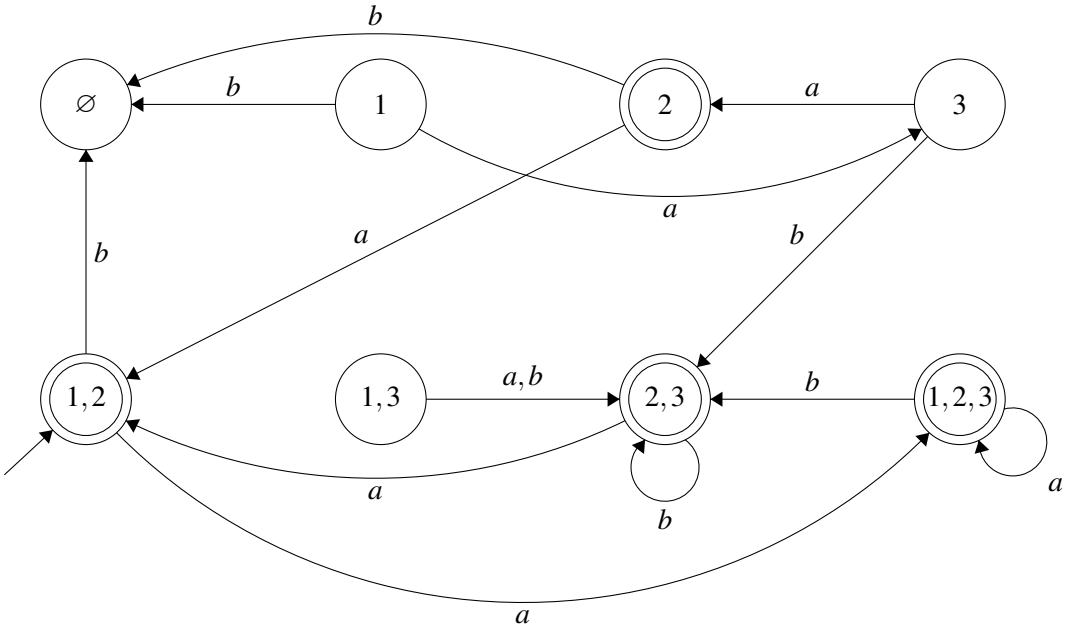
   The DFA for this language is shown below with eight states.



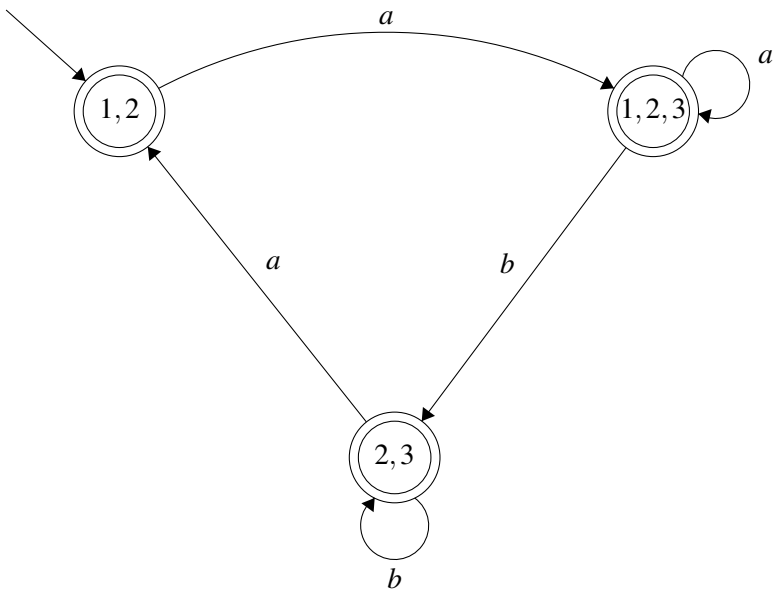
2. The given NFA is shown below.



Converting to a DFA, we initially get a graph like the one shown below.

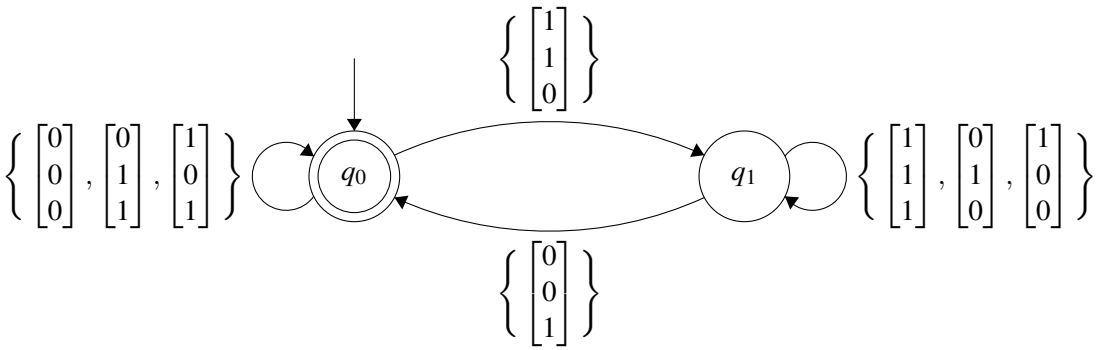


By eliminating nodes that only have outgoing arcs and nodes that are dead end states, we can simplify the DFA to the following:



The language recognized by the finite automata can be defined by L where, $L = \{\ w \mid w$ does not begin with b and w does not contain the substring bab $\}$.

3. To show that B is a regular language, we simply need to show that a DFA can be constructed to accept all states of B. We see this DFA below.



Therefore, B is in fact a regular language.