CS 321, Assignment 1

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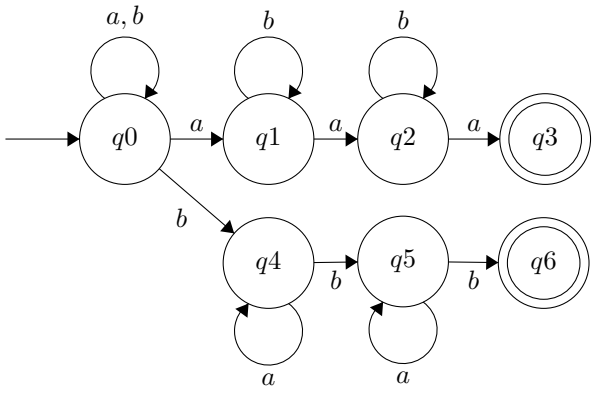
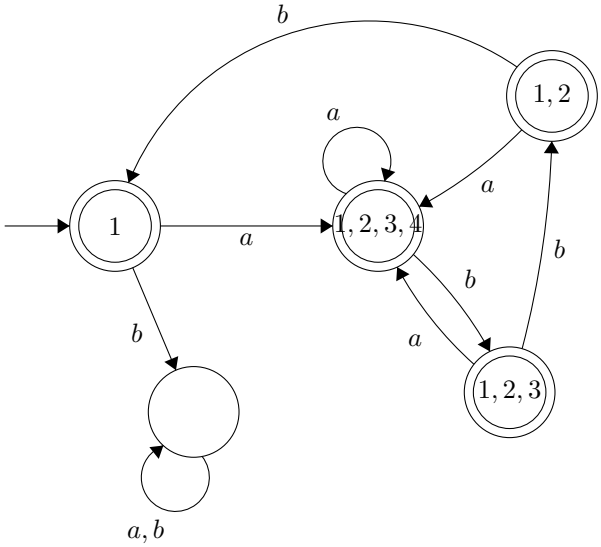
October 7, 2016

1



2



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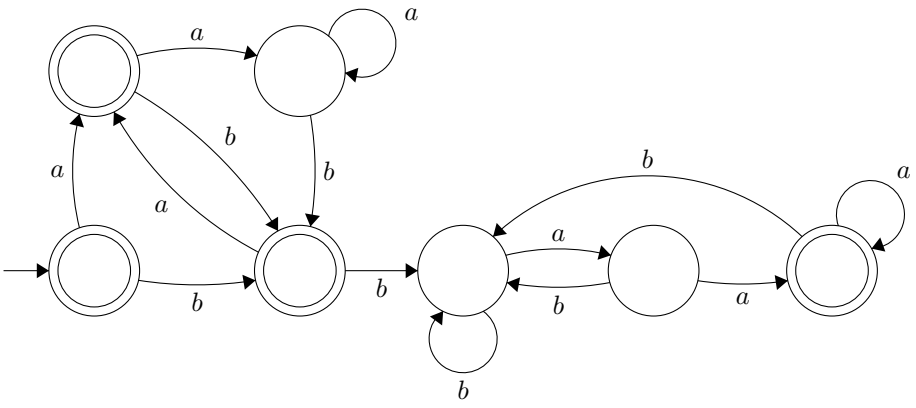
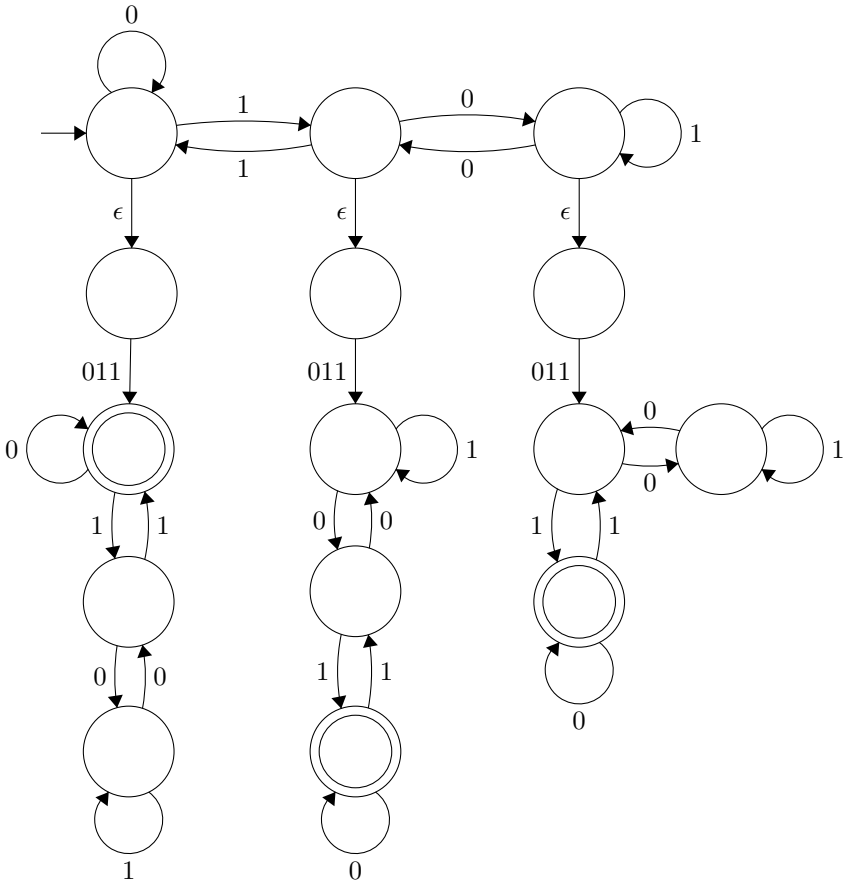


4

We know that $w \in 0, 1^*$ is a regular language. To show that it is still a regular language given a randomly insterted substring, 011, resulting in a value that is a multiple of three, we simply have to show that there is a DFA or NFA that accepts. This can be done with an NFA that starts with a modulus three set of states, then, after the insertion of the substring, checking to see if the resulting string is mod three.

In the following case, the transition function, $p - - > 011 - - > q$ is showing that the substring 011 has been read in.



The above accepts any string that is a multiple of 3 once the substring is inserted at any point. Because we have shown that this can accept, then the language, $w \in 0, 1^*$, given the constraint of mod 3, is regular per the definition of a regular language.