MATH 2113 - Assignment 6

Due: Mar 4

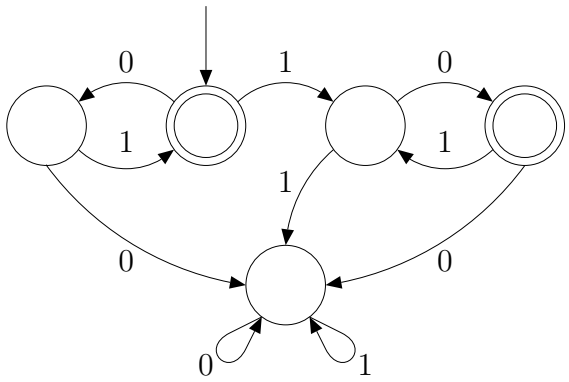
1. Let S be the set of states for a finite automaton and let $\sum$ be the set of characters that it acts upon. We define the next state function $N : S \times \sum \to S$.

   a) Under what conditions is N onto?
   b) Under what conditions is N one to one?
   c) Provide an example for both a) and b) where $|S| = 4$.

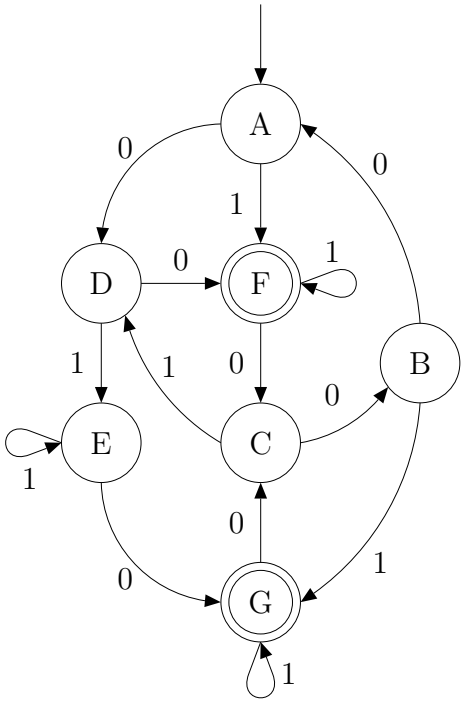
2. Find a finite automaton using the algorithm described in class which accepts the same set of strings generated by the regular expression:

$$0^*(1|11)0^*$$

3. Find a regular expression which accepts the same language as the following finite automaton:



4. Find the finite automaton with the fewest possible states which is equivalent to the following FA:



5. Find three "life" configurations which are periodic with $p \geq 2$ different from the ones discussed in class.