HW Assignment I

1. Write regular expressions for the following languages over the alphabet Σ = {1,0}:   3.5+3.5

   (a) All strings with even number of 0s.
   (b) All strings without substring '01'.

2. Using the lexical specification below, what sequence of the rules is used to tokenize the string "dictionary"?
   Explain your answer   3
   (a) [a-z]*
   (b) dictionary

3. Given an alphabet Σ = {p,q,r},

   (a) write a regular expression of all strings that use at most two of the three letters. (eg., pqqqp,
       rprpp, p, qqq all are valid strings, however, pqr is not)   5

   (b) Draw NFA of the above language.   5

   (c) Draw DFA of the above language showing the transition table   5

4. Consider the following non-deterministic finite automaton (NFA) over the alphabet Σ = {0,1}.
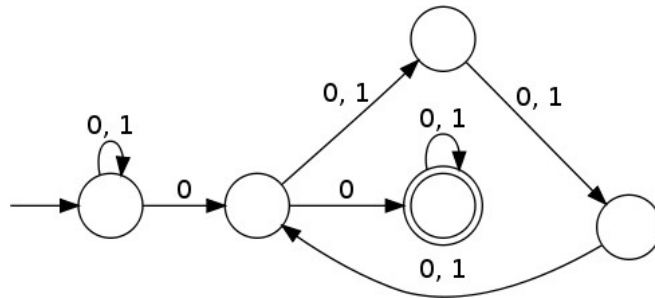
   Write a regular expression for this language.   5

5. For an alphabet {0,1}, draw a DFA representing modulo 3 operations (The DFA only accepts strings divisible
   by 3 (e.g., 0,11,etc.))   10