CSEP 590 Spring 2017 Homework 1

Due: Before class on Tuesday, April 4, 2017
Please use the Dropbox linked from the CSE401 web page to submit your homework online. Any common readable document format is fine.

Problem 1

This exercise deals with the regular expression 10*.
   a. Describe the strings generated by this RE.
   b. Construct an NFA or DFA that recognizes this RE.

Problem 2

This problem is intended to familiarize you with the basic idea behind shift-reduce parsers, since we will not have time to cover parsing algorithms in this course.

Please first read the following Wikipedia page about LR parsing:

https://en.wikipedia.org/wiki/LR_parser

Then consider the following grammar:

   0. S :: = (S)
   1. S ::= [S]
   2. S ::= x

Now consider the following LR(0) parse table for the above grammar, where sN represents shift and move to state N, and rM represents reduce by rule M:

	(	)	[	]	x	$	S
1	s4		s7		s3		Goto 2
2						acc	
3	r2	r2	r2	r2	r2	r2	
4	s4		s7		s3		Goto 5
5		s6					
6	r0	r0	r0	r0	r0	r0	
7	s4		s7		s3		Goto 8
8				s9			
9	r1	r1	r1	r1	r1	r1	

   a. Show the steps that an LR(0) shift-reduce parser goes through when it parses ([(x)]). That is, show the contents of the stack and remaining input at each step.
   b. Show the steps that an LR(0) shift-reduce parser goes through when it attempts to parse ([x]). Does it identify an error? When?