CSCE 222: Fall 2014 Quiz 9 TAKE HOME

A TAKE HOME quiz. Name (No UIN numbers):

This is an open-book take-home quiz. You must work on this quiz yourself, with no assistance from any person or other entity.[1] You may use the book as a resource, your own notes from class, the Student Solution's Guide by Rosen, and/or any resource I have posted on the Piazza web page for this class. You may not use any other resource. You may not use the internet at all (except for the Piazza web page for this class).

Submit this online and also submit a hard copy in class, just like a homework assignment.

On my honor, as an Aggie, I have neither given nor received any unauthorized aid on any portion of the academic work included in this assignment.

Signature(s):

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1. Do Problem 18 in Section 13.1, page 856 of the book.

   Solution: Only the rules are listed. The vocabulary V is clear from the context of the rules. There are many possible solutions.

   (a) $\{01^{2n} \mid n \geq 0\}$
   - $S \to 0A$
   - $A \to 11A$
   - $A \to \lambda$

   (b) $\{0^n 1^{2n} \mid n \geq 0\}$
   - $S \to 0S11$
   - $S \to \lambda$

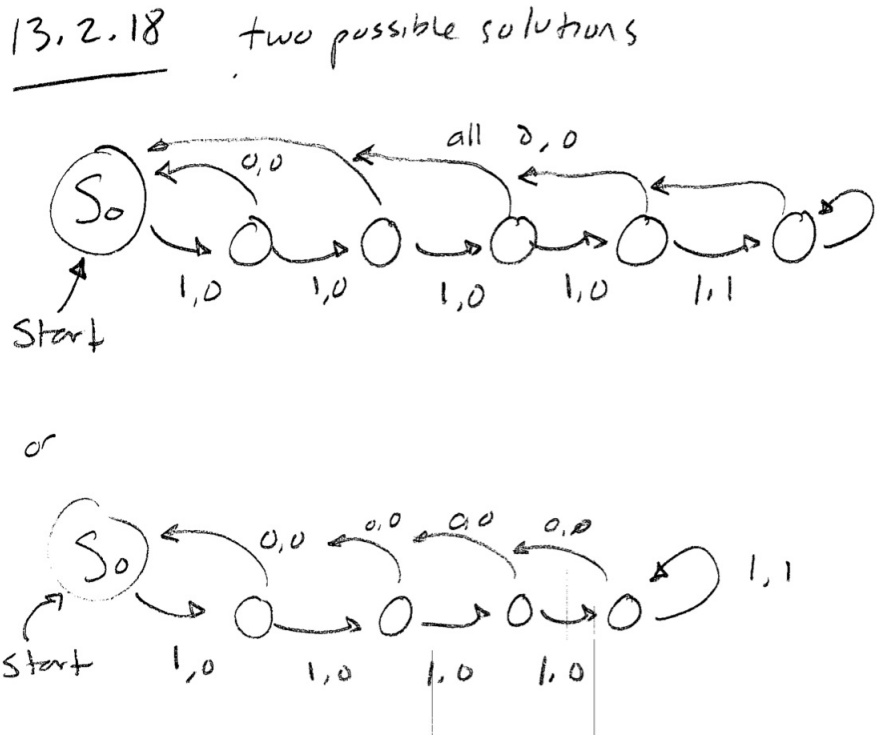
   (c) $\{0^n 1^m 0^n \mid n \geq 0 \text{ and } m \geq 0\}$
   - $S \to 0S0$
   - $S \to A$
   - $A \to 1A$
   - $A \to \lambda$

2. "Do Problem 18 in Section 13.2, page 876 of the book."

   There was a typo in this problem, since the page number is wrong (it should be page 865). Some students may have done problem 18 in Section 13.3 on page 876. So I've posted both solutions.

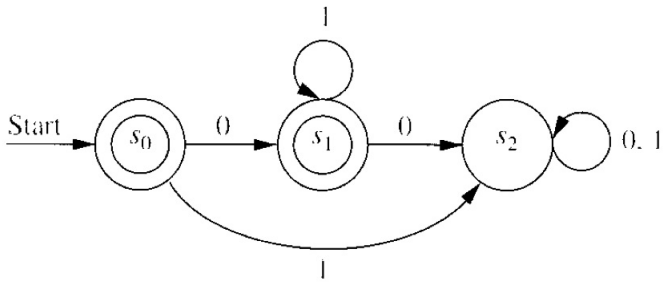
   Problem 13.2.18: Construct a finite-state machine that determines whether or not the input string read so far ends in at least five consecutive 1's. **Solution below**

[1] Exception: You may request assistance from Revellie VIII. If she attends class on Monday, Dec 8th, then everyone attending class on that day gets 100% on this quiz. Really.



Problem 13.3.18: Determine the language produced by the following finite-state automata.

18.



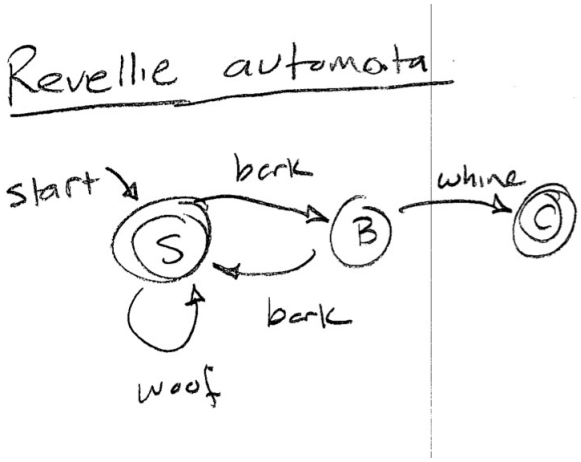
The initial start state is also a final state, so the empty string is accepted. The only other strings that are accepted a zero followed by any number of 1's. Thus, the language is $\{\lambda\} \cup \{01^n \mid n \geq 0\}$.

3. Construct a finite state automata that recognizes the following regular grammar for the Revellie language. The symbols in the vocabulary are *woof*, and *bark*, and *whine*. Be sure to double-circle all final accepting states. Not all states are accepting (Miss Rev must not be interrupted while not in final accepting state, after all).

   - $S \rightarrow \lambda$
   - $S \rightarrow woof\, S$
   - $S \rightarrow bark\, B$

- $B \to bark\, S$
- $B \to whine\, C$
- $C \to \lambda$

Solution:



Discussion (not required): Miss Rev can be silent, since the empty string is in the language (thus it was in class that day). She can woof any number of times. If she barks, she must do so twice and then she can continue to woof. Or, she can bark once, then whine, and then stop.

And yes, much to my surprise, Revellie **did** show up in class!