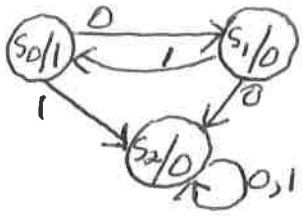
CSCI 3080/MATH Practice Quiz for Section 9.3 Key

1. Draw the digraph for the following table.

Present State	Next State, Present Input 0	Next State, Present Input 1	Output
S_0	S_1	S_2	1
S_1	S_2	S_0	0
S_2	S_2	S_2	0



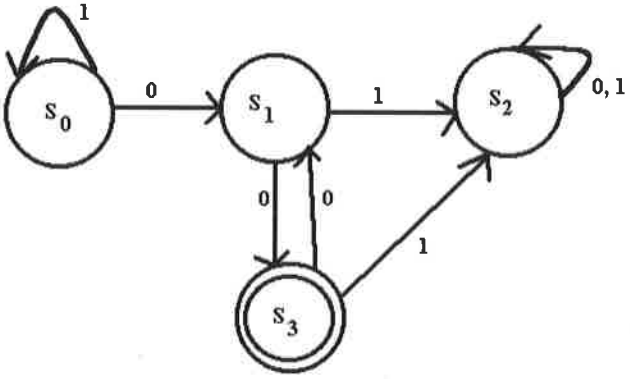
2. If the following were input to the machine in #1, what would be the output? 00100110

10000000

3. If the input from #2 was input into the machine in #1, would the machine recognize the input - assuming it is a recognizer?

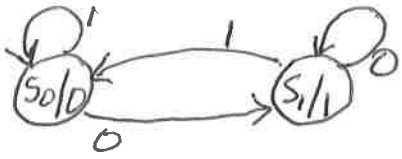
no

4. Draw the table for the following graph.

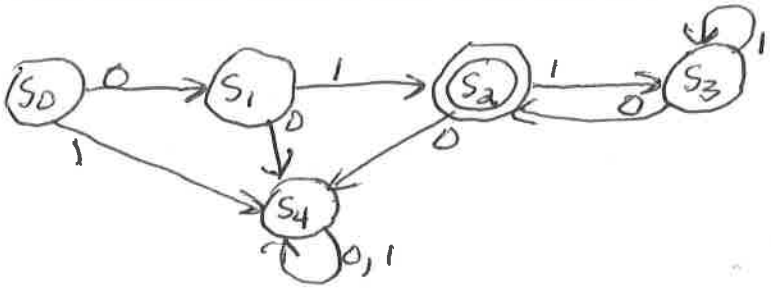


	0	1	out
S_0	S_1	S_0	0
S_1	S_3	S_2	0
S_2	S_2	S_2	0
S_3	S_1	S_2	1

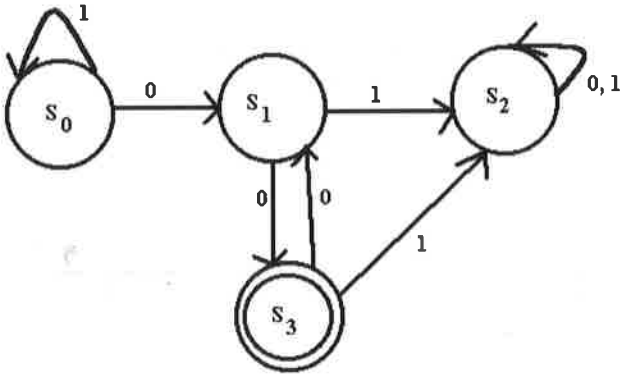
5. Design a finite state machine that will calculate the one's complement of a number. The one's complement of a number exchanges all 1's for 0's and all 0's for 1's. So the one's complement of 1100 would be 0011.



6. Give a finite state machine that will recognize the following regular expression. 01(11*0)*



7. What regular expression is recognized by the following machine?



1*00(00)*

8. What is Kleene's theorem?

Any set recognized by a finite state machine is regular, and any regular set can be recognized by some finite state machine.