UNC Charlotte, Department of Electrical and Computer Engineering
ECGR 2181, Fall 2008, Homework #8
Due: 11/24/2008, at the beginning of class (100 points)

Show all of your work!!!!!

1. How long did this assignment take you? (Answer truthfully!) (5 points)
2. Draw a state diagram for a Finite State Machine with one input, *z*, and three outputs, *a, b, c*. *abc* should always follow the following sequence when *z* = 0: 000, 001, 011, 111, 101, 100, 110, 010, repeat. *abc* should go to the previous value (i.e. 011 to 001) when *z*=1. The output should only change on a rising clock edge. Make 000 the initial state. (40 points)
3. What is distinctive about the sequence shown in problem 2? (5 points)
4. Repeat problem 2, except add another input y. When *y*=1, then the sequence stops (stays at the current state). When *y*=0, then the direction of the sequence depends on the value of *z*. (40 points)
5. For FSMs with the following number of states, indicate the smallest possible number of bits for a state register representing those states: (10 points)
   a) 3
   b) 16
   c) 17
   d) 97
   e) 128