

EE 2381 DIGITAL COMPUTER LOGIC

Homework #10
05 Apr 2007

Professor Jim Dunham
Due: 12 Apr 2007

Review Text: Chapter 5, sections 4-7.

1. Mano 5-9.
2. Reduce the number of states in the following state table and table the reduced state table.

Present State	Next-State		Output
	X=0	X=1	
A	A	B	0
B	F	C	1
C	D	A	0
D	G	E	0
E	E	F	0
F	B	C	1
G	C	A	0

3. A sequential network has one input and one output. Initially the output is a 0. The output becomes 1 and remains a 1 when at least three 0's and two 1's have occurred as inputs, regardless of the order of occurrence. Draw a state graph for a Moore machine (minimum number of states is 12). Your final state graph should be neatly drawn with no crossed lines. Assume initially that no inputs have been seen. *Hint:* What information is needed to determine the output at each point in time.
4. A sequential network has two inputs and two outputs. The inputs (X_1 and X_2) represent a 2-bit binary number N . If the present value of N plus the previous value of N is greater than 4, then the output $Z_1 = 1$. If the present value of N times the previous value of N is less than 3, then the output $Z_2 = 1$. Otherwise, both Z_1 and Z_2 are 0. When the first pair of inputs is received, use 0 as the previous value of N . Find a Mealy state table or graph for the network with a minimum number of states (minimum number of states is 4). Verify that your solution is optimal in the sense of having a minimum number of states. Use the state table reduction approach.