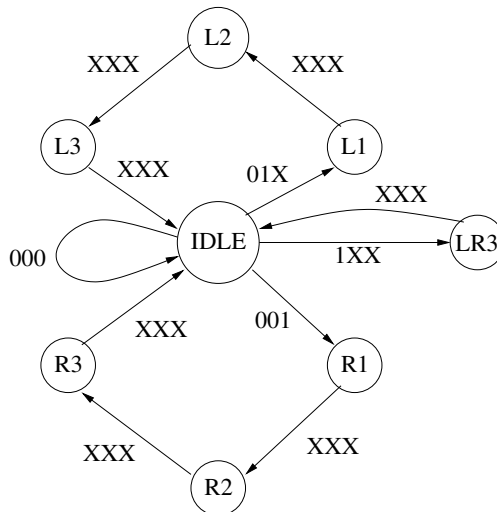
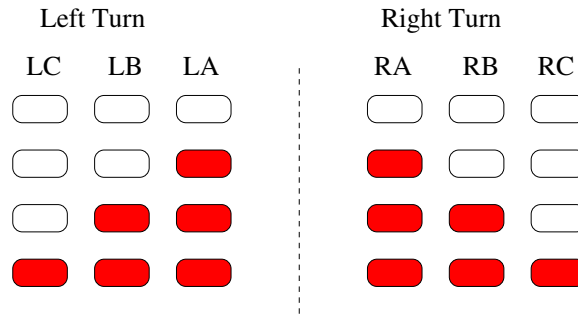
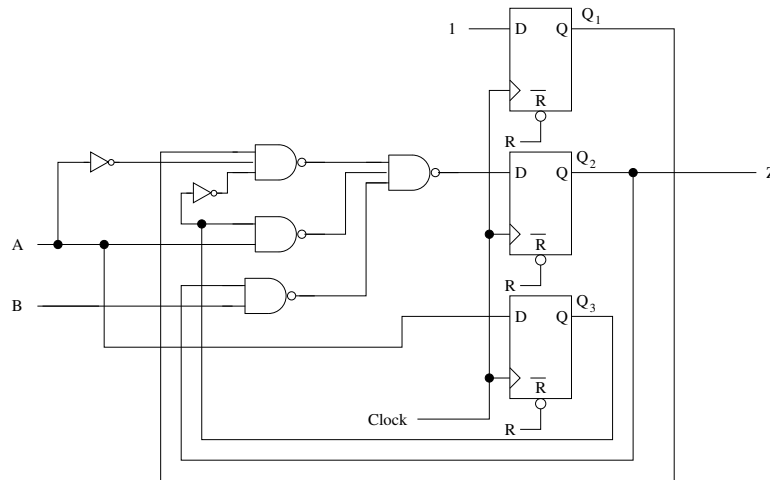


EE 231
Homework 8
Due October 21, 2009

1. The tail lights on classic Ford Thunderbirds operated in segments, as shown below. For a left turn, the sequence would be: no lights, then LA, then LA and LB, then LA and LB and LC, then back to no lights. When the Hazard switch was engaged, all six segments would turn on and off together. A state diagram for the system is shown. Write a Verilog program to implement the T-bird tail lights. The inputs are (hazard, left turn, right turn). The outputs are the six light segments LA, LB, LC, RA, RB, RC. If the hazard switch is on (regardless of the left or right switches), the system will go back and forth between IDLE (no segments on) and LR3 (all six segments on). The left-turn and right-turn sequences should be obvious from the state table. Write a Verilog program to implement the T-bird tail lights.



2. Consider the circuit below. It has three inputs (A, B, and clock), and one output (Z). At reset, the circuit starts with the outputs of all flip-flops at 0.
- Is this a Mealy machine or a Moore machine?
 - Derive the state transition table for the circuit
 - Draw a state diagram for the circuit.
 - Write a Verilog program to implement the functionality of the circuit.



3. Consider the following state transition table:

Present State		Input	Next State		Output
A	B	x	A	B	z
0	0	0	1	1	0
0	0	1	0	0	0
0	1	0	0	0	0
0	1	1	1	1	0
1	0	0	0	1	0
1	0	1	0	0	1
1	1	0	0	0	1
1	1	1	1	0	0

- Is this a Mealy machine or a Moore machine?
- Draw a state diagram for the system.
- Write a Verilog program to implement the system.