

## Homework #2: ECE 461 / 661

State Transitional Logic - Counters - Timers:. Due Wednesday, September 7th

A stoplight is to be designed with four states:

Present State		Duration	Next State	Red	Yellow	Green	Blue <i>(left turn arrow)</i>
00	Stop	5 sec	Left Turn	on	off	off	off
01	Left Turn	4 sec	Go	off	off	off	on
11	Go	5 sec	Caution	off	off	on	on
10	Caution	2 sec	Stop	off	on	off	off

1a) Use state transitional logic to design a ring counter which changes from state-to-state according to the above table. Change whenever a button is pressed.

1b) Use combinational logic so that the LEDs are on and off in the correct order based upon the present state.

2) Repeat problem #1 using timer blocks.

3) Repeat problem #1 using counter blocks with a count to 16 (seconds - one cycle):

Time		Red	Yellow	Green	Blue
Red Light ( 5 sec )	0	on	off	off	off
	1	on	off	off	off
	2	on	off	off	off
	3	on	off	off	off
	4	on	off	off	off
Left Turn ( 4 sec )	5	off	off	off	on
	6	off	off	off	on
	7	off	off	off	on
	8	off	off	off	on
Green Blink Left Turn ( 5 sec )	9	off	off	on	off
	10	off	off	on	on
	11	off	off	on	off
	12	off	off	on	on
	13	off	off	on	off
Yellow ( 2 sec )	14	off	on	off	off
	15	off	on	off	off