

# Digital & Embedded Systems

## ELEC4403

### Lab Assignment 1 – State Machines

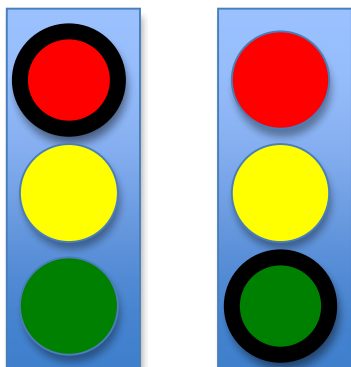
Points: 10

**EQUIPMENT:** PC/Mac with ReTrO simulation system

### Traffic Lights

Build a traffic light system in Retro for an intersection of two streets  
You only have to model one traffic light for each of the two streets.

The repeated light sequence for traffic-light1 / traffic-light2 is as follows:  
{ red/red → red/green → red/yellow+green →  
red/red → green/red → yellow+green/red }



### EXPERIMENT 1 (3 points)

Implement the given task with a pulse generator module with 6 output lines, one for each traffic light.

### EXPERIMENT 2 (7 points)

Implement the given task as a state machine using only combinatorial logic elements, flip-flops, and a simple clock to generate the system pulse. Do not worry about actual timing differences between states.