## CSC410

## CTL CLASS EXAMPLES

- (a) **Mutual Exclusion**: processes 1 and 2 are never simultaneously in their critical sections. Like before, use  $c_1$  and  $c_2$  as your atomic propositions.
- (b) Mutual Exclusion: each process has access to its critical section infinitely often.
- (c) **System Restart**: in every reachable state of the system, it is possible to return to a start state of the system. Use the proposition *start* which is true when the system is in any of its start states.
- (d) **System**: if a system never *deadlocks* (*d*), then there is a possibility for something *good* (*g*) to eventually happen.
- (e) **Traffic Light**: If the light is red and at some point in the future switches to yellow, then there is a possibility that it will eventually turn to green.
- (f) **Mutual Exclusion and Nonstarvation**: The processes 1 and 2 access the critical section in a way that they permit another process to have the possibility of accessing it in between their accesses.
- (h) **System Persistence**: the system, in all future, will eventually hit a stable state in which *good* will hold in stable way from that point on.
- (i) **Prove or disprove**:

 $\forall \Diamond \Phi \land \forall \Diamond \Psi = \forall \Diamond (\Phi \land \Psi)$ 

 $\forall \Diamond \Phi \lor \forall \Diamond \Psi = \forall \Diamond (\Phi \lor \Psi)$ 

$$\exists \Diamond \Phi \lor \exists \Diamond \Psi = \exists \Diamond (\Phi \lor \Psi)$$