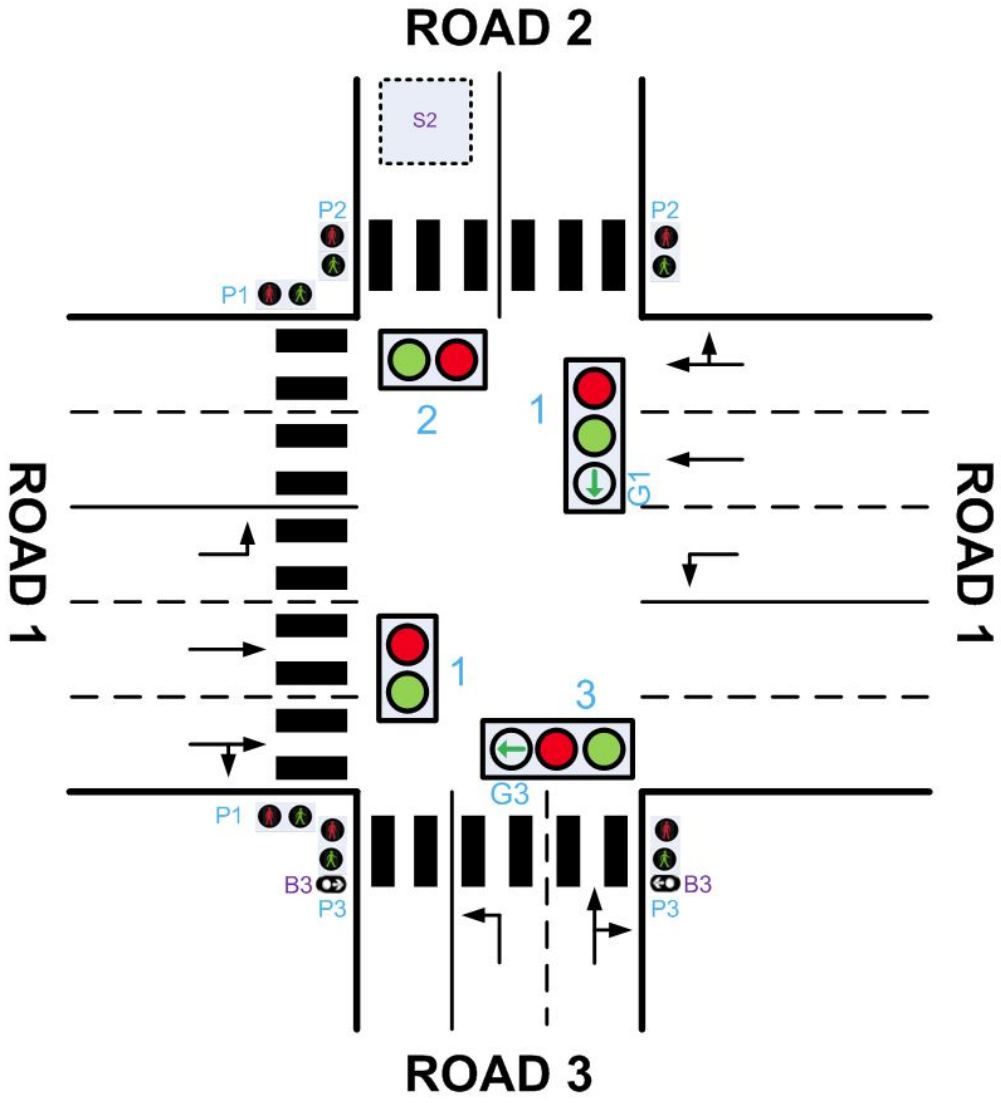
ECE 321 Software Requirements
Lab 1



Lab D42
Due Date: September 30, 2018
Team Name: Status 200
Animesh KC 1495641
Songhui Zhang 1499982
Joshua Chang 1503200
James Hryniw 1431912

Interview 1 - Masha

This interview focused on producing a summary of all the light configurations corresponding to each state in the TLS. We also produced a state diagram outlining the state transitions, triggered by the system inputs.

- Interviewee profile: Masha is a Software Engineer tasked with software + hardware roles
- The users of the system are everyone who passes through the intersection (Drivers and pedestrians)
- Existing system, but no traffic data available
- Project is different from other systems
    - No yellow lights
- Traffic System
    - Modes of Operation
        - Normal, Night, Emergency
    - Inputs to the system
        - Countdown timers T1, T2
        - Emergency switch
        - Emergency reset
        - Clock switch
        - Pressure plate S2
        - Button B3
    - Main states are the Default, Green G1, Green G3, Green P3, Green 2 and 3, Night mode, and Emergency modes
- Goal of the project is to change the system controlling traffic to be something smarter
- Software Restrictions
    - No restrictions on licensing
    - Must comply with Alberta Traffic Safety Act
    - All failures must return to the emergency mode
        - States of emergency include problems in software/hardware or any crash
- After restoring the system, go to the emergency mode

See next page for state summary and state diagram

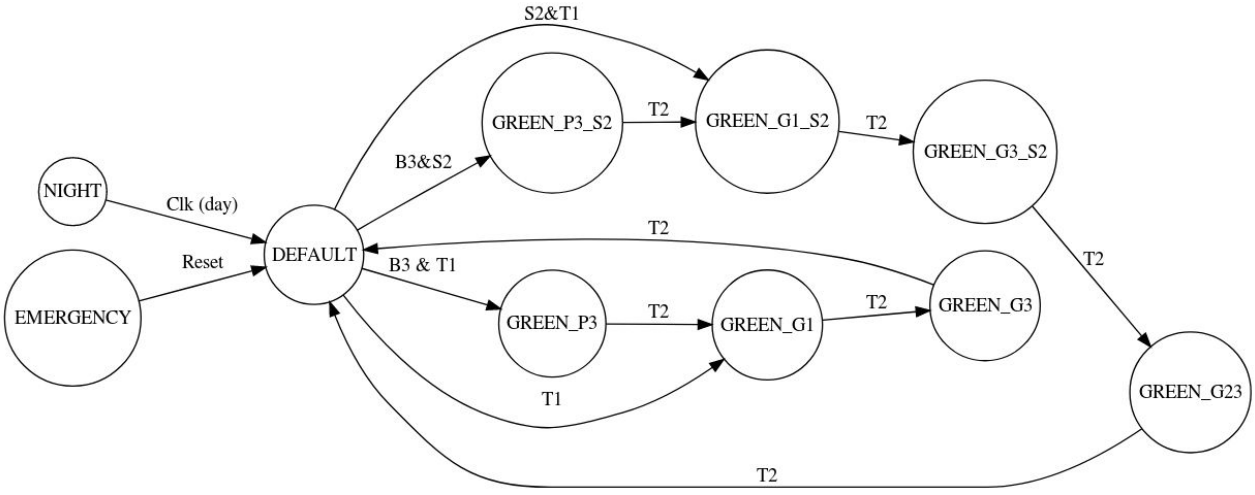
Table outlining the status of each signal for each state. Annotations correspond to the intersection diagram on the cover page:

	GREEN G1	GREEN 3	GREEN P3	GREEN 2 3	NIGHT	EMERGENCY	DEFAULT
1	R	R	G	R	BG	BG	G
2	R	R	R	G	BR	BR	R
3	R	G	R	G	BR	BR	R
G1	G	R	R	R	Off	Off	R
G3	R	G	R	R	Off	Off	R
P1	G	R	R	R	Off	Off	R
P2	R	R	G	R	Off	Off	G
P3	R	R	G	R	Off	Off	R
TMR T1	Off	Off	Off	Off	Off	Off	On
TMR T2	On	On	On	On	Off	Off	Off
CLOCK	D	D	D	D	N	D/N	D
MAL*	Off	Off	Off	Off	Off	On	Off

* system malfunction state

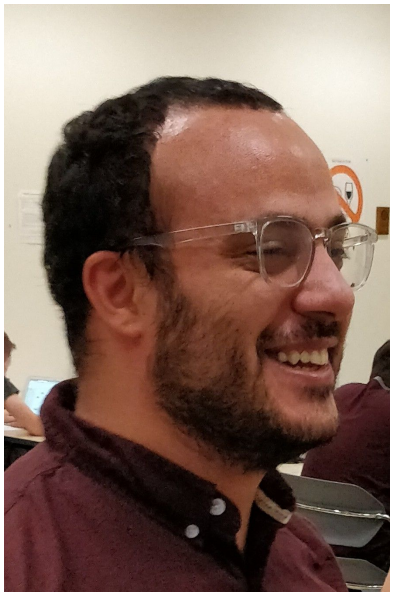
Proposed state diagram of the system:

- Night mode is entered when the clock enters nighttime (10 PM - 6 AM)
- Emergency mode is entered when system receives emergency signal
- Arrows lead to the next state after all conditions are met
    - B3 is pressed, S2 is triggered, T1 / T2 expires.
- Pressure plate S2 triggers special versions of states (marked by _S2)



Interview 2 - Ahmed

The interview with Ahmed focused on gathering the non-functional requirements of the system.



- Software Restrictions
    - Must comply with Alberta Traffic Safety Act
    - Computer restrictions
        - Program must be smaller than 450 kB of memory
        - Program must use less than 54 kB of RAM
- Reliability
- Documentation
    - System Documentation
    - User Guide
    - Software Maintenance Document
- Additional input - Reset Button
    - Upon reset, goes into emergency mode before default mode
    - Before resetting the system, there should be a set timeout of around one minute before going back to the default state
- Trigger for night mode is the clock signal

Recap Questions - Cor-Paul

- System Priorities (most important to least important)
    - Road 1, then Road 3, then Road 2
- T1 and T2 are configurable values, do not specify them