Embedded Traffic-Light Controller
Finite-state machines with timing constraints and pedestrian buttons.

1. **Define Objectives:**
a. **Each student should define and contribute their individual objectives for the project, along with proposing overall objectives for the team.**
Hayden Trent

My personal goals are to create a traffic light system that is actually feasible, even if the wheel isn't reinvented for it. I personally also would like to see it graphically represented as if we were presenting it as a product, and because I could utilize knowledge of C++ with graphics for personal projects later.

Jack Lu

My goals are to enhance my understanding of object-oriented design through a self guided project that implements real world systems into a programmed representation. In addition, I hope to better understand the process behind prototype iteration through the phases that may naturally come as a result of creating a traffic light system that incorporates pedestrian signals. Lastly, I hope to gain a better understanding of the issues laid within the Boston transit system and traffic system that seems to cause holdups and slow down zones on a daily basis.

Liang Wenxuan

My personal goal is to strengthen my understanding of timing control yet more in the face of embedded systems. I will focus on implementing a structured and modular object oriented design. I will make sure to make each traffic signal work as a standalone object while interacting properly with the overall system.

b. **Collaborate as a team to refine and finalize a cohesive set of objectives that align with the project's overarching goals.**
Create a traffic light controller that is conducive to the most efficient flow of traffic while protecting pedestrian traffic from cross-traffic driving.

2. **Select Technologies and Tools:**

a. Discuss and agree on the programming languages, tools, and frameworks that will be used for the project.
   - C++
   - Traffic light system that demonstrates the principles of the green wave
   - OOP, where each traffic light is considered an object and the functions are in regards to turning the lights from yellow to red to green
   - Update output whenever a light changes at around 3 second intervals, using different symbols to illustrate green, red and yellow lights in a row.

Each horizontal row represents a series of traffic lights, with – representing red, o representing green, and / representing yellow. The vertical columns are demonstrating how a green wave may behave in time intervals.

      Ex. - o / - - -
           - - o / - -
           - - - o / -
   - Create pedestrian light system

3. **Create a Project Timeline: SUBMITTED SEPARATELY IN EXCEL FILE**
a. Develop a detailed timeline outlining key milestones.
   We will create a Project Schedule in a separate Excel document. This schedule outlines all key milestones and project phases, including system design, implementation, testing, and more.
b. Include specific tasks, responsibilities, and deadlines for each phase of the project.
   The schedule includes development milestones, tasks for each phase, responsibilities assigned to each team member, completion deadlines, and buffer time for debugging and modifications.

4. **Document the Plan:**
a. Each team member should contribute to a PDF document that includes:
 i. Project scope
    Provide a detailed description of the system's purpose, functions, and goals.
 ii. Individual and team objectives
    Clearly define each member's responsibilities and the overall goals of the team.
iii. Project plan and timeline
    Outline the project development phases and references to the detailed Excel timeline.
b. Upload the final PDF document to your project's GitHub repository.

The final PDF will include every detail and uploaded to the project's GitHub repository.

c. Share the GitHub link as part of your final project submission.
The GitHub repository link will be submitted as part of the final project submission. The code repository will contain the source code for the traffic light controller.

Project Scope:

We will be designing a simulation for a traffic light system design, including integration of pedestrian walkways, emergency traffic systems, efficient left turns, and power-loss contingencies.

Team Roles:
Jack Lu: Main System Engineer: Primarily responsible over the functions of the actual traffic light system, the and the functions that make it up.
Liang Wenxuan: Testing Environment Engineer: Primarily responsible for designing the testing environment that demonstrates the function of the system and collecting data on the results of the tests.
Hayden Trent: Simulation Engineer: Primarily responsible for integrating the traffic light system, and testing environment into an actual graphical display.

Project Plan and Timeline are uploaded separately.