EECS 481 Software Engineering
Project 2 Description
Cruise Control

An automatic cruise control system is an embedded system that automatically controls the cruising speed of a vehicle. It can be abstractly viewed as a system that seeks to equalize the difference between the cruising speed that was set by the driver and the signal that indicated the vehicle's actual speed.

The controller takes input from the set cruising speed and the actual vehicle speed and produces a control signal for the engine throttle actuator. The history of the difference between these two input signals must also be taken into account.

Safety is important. The vehicle must always be able to be returned to the driver's control. It must be simple to use and understand, with no prior experience.

Constraints

- There should be controls that manually turn the whole system on and off.
- There must also be controls conveniently located for the driver that can set the speed, cancel the cruise control, allow for acceleration, allow for coasting or deceleration, and allow for resuming of speed.
- When the engine is turned off, the cruise control must turn off. If the engine isn't on, the cruise control is void.
- When the brake is hit, the cruise control system is canceled. The resume button returns the system to the previous cruise control speed.
- Acceleration from the pedal allows the vehicle to go faster than the currently set cruising speed. When pedal is released, the speed returns to the set speed.
- Appropriate LEDs must be included to tell the driver that the cruise control is on or off.
- The coast and accelerate features will reset the current set speed in increments of one.

Critical safety features
- The system must never get into a state where the driver cannot cancel the control of the cruise control.
- The system must be able to respond to cancellation or braking in a short enough period of time for the driver to feel that the cruise control has been disengaged.
- The vehicle must maintain a reasonably consistent speed without braking while going down hills, without massive acceleration while going up hills, and without any quick acceleration/deceleration cycles.