Week 4 Statement on Project Standing

In week four I completed the physics task. The physics task is the core of the game. At this point there is a playable game, you can move the rocket around and then win or lose. It was not as much work as I thought it would be but there is more tuning to do in the future to make it more realistic and/or more fun to play. Time permitting, I want to add obstacles or something to add to the gameplay.

I have completed 67% of the scoped work, (23/34hr) in 59% of the initial time estimate (20/34). I am ahead of schedule because the display last week went well and the physics was not as time consuming, but I think there will be more time spent "tuning" in addition to debugging.

Scoped Work

Work Item	Description	Estimated Time	Status
Project Planning	Create an initial task diagram and documents for week1. Have an idea of project design.	2 hrs	Complete
Data Structure Setup	Setup initial data structures for rocket, message queue, angle setpoint, and throttle setpoint.	2 hrs	Complete
Writing Unit Tests	Write initial unit tests. Should fail until further development. Challenge in porting in data needed between cutpoints.	3 hrs	Complete
ITC and Shared Resource Setup	Establish the structures needed between tasks, such as semaphores, timers, mutexes, and the tasks themselves.	1 hr	Complete
Angle Task	Develop code for angle task to pend on semaphore from button ISR and write to angle setpoint.	0.5 hrs	Complete
Throttle Task	Develop code for throttle task to pend on semaphore from timer and write to throttle setpoint.	0.5 hrs	Complete
LED/PWM Task	Develop code to drive LED's based	0.5 hrs	Not Yet

	on PWM. PWM code itself is created in a separate work item.		Complete
Rocket Design	Practice with the micrium graphics library to design how the rocket will look and what are the meaningful points.	1 hr	Complete
Display Task	Develop code for display task to take data from rocket data structure and display the rocket. Challenge is to display the rotation of the rocket graphic, here the math is done to move the vertices of the rocket.	5 hrs	Complete
Physics Task	Develop code for physics task. This is the bulk of the project. Includes programming kinematic equations to computing the acceleration, thrust, fuel, position, and rotation of logic. Will also be responsible for knowing if a win or loss has occurred.	8 hrs	Complete
PWM config	Create the routines necessary to program configurable PWMs using software timers. Needed by LED task.	2.5 hrs	Not Yet Complete
Configurability Implementation	Program a home screen on the game that takes in input via the buttons. Also takes config either through config file or changing settings in project code.	3 hrs	Not Yet Complete
Blackout Calculations	Figure out max acceleration and how to respond to blackout.	1 hr	Not Yet Complete
Debug	Built in time to debug. After all previous work items complete it is expected that the project is not fully functional without substantial debug work.	4 hrs	Not Yet Complete

Completed this Week

Physics Task:
The update from the professor was very helpful in unlocking how to do the thrust force calculations. Other than that the actual physics in the physics task was pretty straightforward kinematics type work and lots of trigonometry. Besides the math, this week's work involved a lot of game control development: checking if the user won or lost and allowing them to reset the game. Blackout calculations are not done yet. A lot of time was also wasted on playing the game prototype over and over.