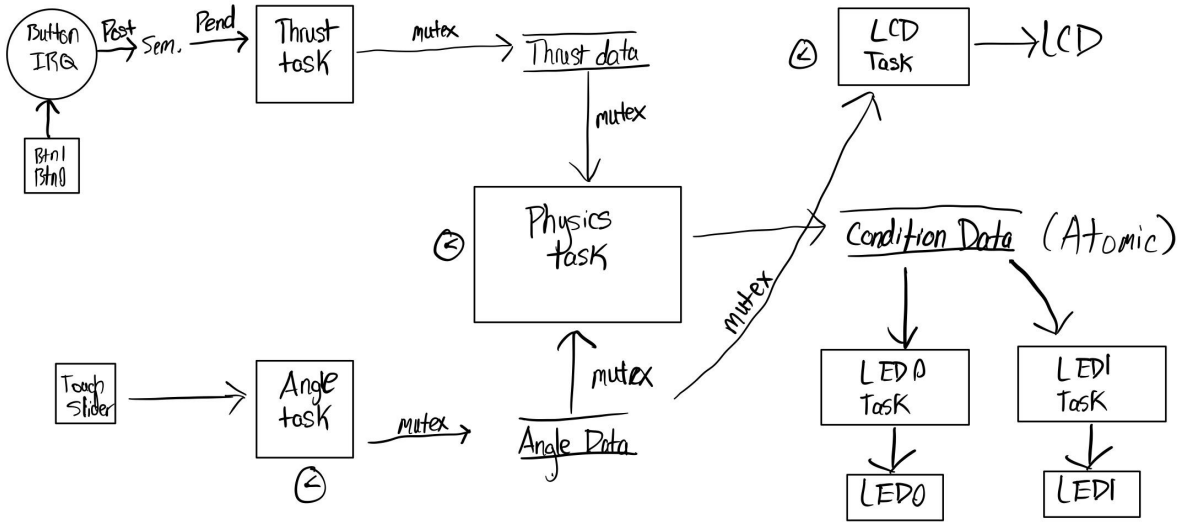
Task Diagram



Work Items

Task	Estimated Time (Hrs)	Actual Time (Hrs)	In Progress/Done
Project Planning	2	3.25	
Create Unit Tests	3	3	
Create Project Files	0.5	0.5	
Implement Button IRQs	1.5	1	
Instantiate all OS Resources	2	2	
Add Functional Tests	2	0.5	
Import LCD Sources	2	3.5	
Implement Config File	1.5	1	
Implement Thrust Task	3	0.5	
Implement Angle Task	3		
Implement Physics Task	8	0.5	
Implement LCD Task	4		
Implement LED Tasks	3		
Total	35.5	15.75	
Percent Done	44.37%		

Testing Plan

Unit Tests

1. Test Case: Valid AngleValues

    a. Test that the Angle task is getting proper values into the angle data structure when no input
    b. Value with no input should be -1.
2. Test Case: Valid Angle Values
    a. Test Angle task is setting proper value to angle data structure with user input
    b. Value with input to far left of slider should be 0.
3. Test Case: Valid Angle Values
    a. Test Angle task is setting proper value to angle data structure with user input
    b. Value with input to left of slider should be 1
4. Test Case: Valid Angle Values
    a. Test Angle task is setting proper value to angle data structure with user input
    b. Value with input to right of slider should be 2.
5. Test Case: Valid Angle Values
    a. Test Angle task is setting proper value to angle data structure with user input
    b. Value with input to far right of slider should be 2.
6. Test Case: Valid Thrust Values
    a. Test thrust task is correctly setting thrust data on button 0 interrupts.
    b. Should set button 0 field in struct to true
    c. Should decrement the thrust counter by 5.
7. Test Case: Valid Thrust Values
    a. Test thrust task is correctly setting thrust data on button 1 interrupts.
    b. Should set button 1 field in struct to true.
    c. Should increment the thrust counter by 5.
8. Test Case: Valid Thrust Values
    a. Test thrust task with zero thrust percentage.
    b. X component for acceleration should have a zero value
    c. Y component for acceleration should only be the gravitational constant
9. Test Case: Valid Thrust Values
    a. Test thrust task with increment button held for longer period of time (3 presses)
    b. Decrement button once to test in unison.
    c. Verify by checking value of thrust.
10. Test Case: Valid Thrust Values
    a. Test thrust task with increment button held for longer period of time (11 presses)
    b. Verify by checking thrust caps out at 100.
11. Test Case: Valid Physics Velocity
    a. Test velocity with thrust value of 0
    b. Check velocity over a time period
    c. Verify velocity value
12. Test Case: Valid Physics Velocity
    a. Test velocity with non-zero thrust value

b. Check velocity over a time period
c. Verify velocity value

Functional Tests

1. Test Case: Test LCD Functionality.
    a. Check that LCD is correctly initialized by displaying a Message
2. Test Case: TEST LCD Functionality
    a. Ensure that LCD is updating at a reasonable speed to ensure playability.
3. Test Case: LCD Functionality
    a. Verify that exiting the bounds of the screen ends the game.
4. Test Case: Test LED0
    a. Test LED brightness at different duty cycles to verify correct PWM implementation. Verify by seeing brightness of LED with different values.
5. Test Case: Test LED
    a. Test with healthy flight conditions
6. Test Case: Test LED
    a. Test with blackout flight conditions
7. Test Case: Test LED
    a. Test with game over conditions
8. Test Case: Test Config Data
    a. Test with values that should quit simulation
9. Test Case: Test Config Data
    a. Test with valid values and verify that game continues.
10. Test Case: Test Physics Model
    a. Test whether the physics model is simulated correctly

Test Summary

All the above unit tests have been implemented. Only the tests pertaining to the angle task have been completed completely and are passing.

I have also implemented a set of functional tests for my project. As of now, the functional tests have not been added into the code other than the LCD functionality. I plan on using assert statements to verify some of the tests and others will be visually observed by the user.

Project Standing

This week, I have advanced further in the actual development of the project. I have begun working on the thrust task and added the interrupt handlers for the buttons. I have also imported my project into the example project with the LCD and have verified that the tasks and such I implemented last week are working so far in SystemView. Lastly, I created a header file containing defines for all of my initial conditions and such. I spent a little more time than anticipated trying to verify my tasks in System View, once I imported into the LCD project, so I

was only able to complete an additional ~15% of work into my work items. So far I have completed 44.37% of my scoped tasks and should be on track to complete the project.