**RTOS Final Project – Week 2**

**Development Time**

|  |  |  |
| --- | --- | --- |
| **Task** | **Estimated Time** | **Actual Time** |
| Fuel Control Task Implementation | 60min | 40min |
| Angle Task Implementation | 60min | 60min |
| Redo Unit Test Plan | 10min | 10min |
| Fuel Control Task Unit Test | 30min | 60min |
| Angle Task Unit Test | 30min | 20min |
| LED Task Unit Test | 30min | 20min |
| Project Status Update | 5min | 5min |
| Summary Effort & Estimate Numbers | 5min | 5min |
| List of In-Scope Work Items | 20min | 15min |
| Risk Register Update | 15min | 5min |
| **Total** | **4hr 15min** | **4hr** |

**Unit Testing Plan**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Number** | **Unit Under Test** | **Description** | **Status** |
| 1 | Fuel Control Task  (Btn 1 pressed) | * Verify proper fuel burn rate update upon button 1 press | Pass |
| 2 | Fuel Control Task  (Btn 0 pressed) | * Verify proper fuel burn rate update upon button 0 press | Pass |
| 3 | Fuel Control Task  (Multiple pressed) | * Verify proper fuel burn rate update after multiple button presses | Pass |
| 4 | Angle Task  (Far left position) | * Verify proper angle update upon far left position press for X amount of time | Pass |
| 5 | Angle Task  (Left position) | * Verify proper angle update upon left position press for X amount of time | Pass |
| 6 | Angle Task  (Right position) | * Verify proper angle update upon right position press for X amount of time | Pass |
| 7 | Angle Task  (Far right position) | * Verify proper angle update upon far right position press for X amount of time | Pass |
| 8 | Angle Task  (No Press) | * Verify that no update occurs when no position is pressed | Pass |
| 9 | LED Task  (LED0 & LED1 healthy) | * Verify LED0 duty cycle is equal to current thrust as a percentage of max thrust * Verify that LED1 duty cycle is equal to the current acceleration as a percentage of blackout acceleration | Pass |
| 10 | LED Task  (LED0 & LED1 blackout) | * Verify LED0 duty cycle is equal to current thrust as a percentage of max thrust * Verify that LED1 duty cycle is equal to 50% and has a frequency of 3Hz during blackout | Pass |
| 11 | LED Task  (LED0 & LED1 crashed) | * Verify LED0 duty cycle is equal to current thrust as a percentage of max thrust * Verify that LED1 duty cycle is equal to 50% and has a frequency of 1Hz after crashing | Pass |

**Project Status**

Re-did the unit testing plan due to misunderstanding what they should consist of during week 1. Also implemented and passed unit testing for the Fuel Control, Angle, and LED tasks. There are still unit tests to do on the Physics and LCD tasks, but I plan to begin implementing those once I have a better understanding of how they will operate.

So far have implemented the Fuel Control and Angle tasks in the embedded code.

**Summary of Effort & Progress Estimates**

I have completed 12% of my currently-scoped, estimated work (4/32.5hr) in 94% of the initially-estimated time (4/4.25hr). My best guess of my say/do ratio is 94%, so to unbias my estimates after this class, I may want to multiply my estimates by 1.06 (100%/94%).

My Latest scope is 100% of my original scope (35hrs, vs. 35hrs).

**List of In-Scope Work Items**

* Completed this week
  + Fuel Control Task Implementation (2hr)
    - *I have implemented the fuel control task in my embedded code. In this task I use a semaphore in the button ISR to wake up. I then calculate the new fuel burn rate based on which button was pressed, and store that calculation in a mutex protected data structure. An event flag is then posted which will be used to notify the physics task that fuel burn rate has been updated.*
  + Angle Task Implementation (2hr)
    - *I have implemented the angle task in my embedded code. In this task, I use a timer callback to wake up. I then calculate the new angle based on which position on the slider is being pressed, and store that calculation in a mutex protected data structure. An event flag is then posted which will be used to notify the physics task that the angle has been updated.*
* Incomplete
  + Physics Task Implementation (6hr)
  + Graphics Task Implementation (6hr)
  + LED Task Implementation (5hr)
  + Unit Test Development (4hr)
  + Unit Testing (0.5hr)
  + Functional Test Development (5hr)
  + Functional Testing (2hr)
* Complete
  + Design Planning (2.5hr)

**Updated Risk Register**

Graphical user interface, chart

Description automatically generated with medium confidence