Tommy Ramirez
4/1/22
ECEN 3753

<center>Project HarkonnenPong Week 3</center>

<u>Unit Testing</u>
    <u>Platform Motion</u>
- Test if platform doesn't move when no force is applied and velocity is 0 (Pass)
- Test if platform maintains nonzero velocity when no force is applied (Fail)
- Test if platform increases velocity when force is applied in the same direction of the velocity (Fail)
- Test if platform decreases velocity when force is applied in the opposite direction of the velocity (Fail)
- Test if low and high force has difference on accelerations (Fail)
    <u>HM Motion</u>
- Test maintained x velocity of HM (Pass)
- Test constant downward acceleration of HM (Fail)
    <u>HM Out of Bounds Check</u>
- Test LED flag set when HM crashes (Fail)
- Test if HM is replaced when HM exits range (Fail)
- Test if HM is replaced for a number of times based on a variable (Pass)

<u>Functionality Deliverables and Usability Summary</u>

This week I finished modeling PWM changes from different slider positions. I also set up most of the unit test conditions for the physics task and the boundary hitting condition task with hm replacement in preparation to do some mild test driven development. There was also testing for the slider to see if the problem where there was false detection from the capsense in the previous labs still existed, and preparations were made with a friend's code to see if replacing that potentially faulty capsense code would fix the issue.

<u>Summary effort & estimate numbers</u>
I have completed **23.75%** of my currently-scoped, estimated work time (28.5 actually spent /120hr total estimate) with **40.4%** of the initially-estimated work. (48.5 estimated for the items I have completed, of 120hr total estimate). For the work that has been completed, I took **0.59x** (28.5/48.5) as much time as I estimated.

No scope changes have been made this week, My latest scope is still my original scope (120 hrs), but the estimates include partial completion contributions.

<u>In-scope work items</u>

Completed before this week:

- Project Reading and Task Diagram First Draft creation (est 10 hrs) (actually 8 hrs)
- Learn How to Manipulate LCD basic drawings (est 20 hrs) (actually 1 hr)
- Lose Condition LED Control (est 1 hr) (actually 0.5 hr)

Completed this week:

- Configure slider to control LED PWM (est 2 hrs)(actually 3.5 hrs)

I thought this would have been easier at first, but the slower tick made it difficult to determine the PWM rates to give the illusion of different brightnesses if you can see if turning off. I compromised and decided to make it have 5 different noticeable blinking speeds.

- Create Tasks and Test on Segger (est 2 hrs)(actually 2 hrs)

I created all the tasks shown in the task diagram. During this time I contemplated their importance and how they should interact with each other. No changes to the diagram were made but it helped solidify my understanding.

Significant Partial Completion for estimate numbers:

- HM Physics Unit (est 10 hrs)(4 hrs so far)(40% progress complete)

Just Test Driven Development so far.

- Platform Motion (est 1 hr)(4 hrs so far)(50% progress complete)

Just Test Driven Development so far.

- Task Unit Testing (est 10 hrs)(4.5 hrs so far)(70% progress complete)

Most of the unit tests are created but more could be created. The functions they are testing also need to be coded. The 80/20 completion rule will probably take the remaining 5.5 hours.

- Slider Testing/Fixing (est 6 hrs)(1 hr so far)(33% progress complete)

A friend gave me his unflawed, slider code. I am testing Lab 7's code to check if the detection problems with a false positive on detection for some sections still occur. If the flaw still occurs, I will try replacing the slider code with the friend's code to try to fix it and see if the error occurs less often or completely disappears. If the flaw doesn't occur in my original code or also occurs in the friend's code, I will use my lab 7 slider code with caution. I overestimated how much time I thought it probably would take.

Not Completed yet:
- Task Diagram Revision for clarification and necessary optimization (est 3 hrs)
- Basic Platform/HM collision (est 2 hrs)
- Platform/HM collision with bounce (est 5 hrs)
- Motion/Position Physics Task (est 10hrs)
- Laser Implementing (est 1 hr)
- Platform Bounce (est 2 hrs)
- Task Integration Testing (est 10 hrs)
- Qualification Check/Debugging (est 15 hrs)
- Platform Interception Prediction LED implementation (est 5 hrs)
- Commenting and Code Cleanup (est 5 hrs)

Risks

Item				Risk (P*	Recognize	Mitigated/ Resolve	ROA	How
I will too long to figure out the LCD screen		2	5	10	11-Mar-22	Mitigated	M	Got help and clarification on the basics from a TA
PWM is too slow to change brightness		8	3	24	15-Mar-22	Mitigated	M	Changed goal from changing brightness to blinking rate
Changes in PWM can't be recognized/decoded		3	13	39	17-Mar-22		O	Use own judgement for which PWMs are distinct enough
My slider is sticking after some time operating		13	8	104	11-Mar-22		A	Test with other slider code if time is available or rely on unit tests
				0				
				0				