RTOS Project Week 3

Project started at 5:23pm on 11/8/2022.

I estimate the following times to complete tasks this week:

Task	**Estimated Time**	**Actual Time**
Write physics engine	4 hour	3 hour
Platform movement	30 min	30 min
Debug failing unit tests	1 hour	1 hour 15 min
HM System	2 hour	30 min
Total	7 hour 30 min	5 hour 15 min

This week, I wrote the entire physics engine. I have experience writing these engines from amateur game development with Unity, so this wasn't too bad. In addition to this, I debugged the failing unit tests to make them all succeed. I had some issues with comparing floating point numbers, but I was able to solve this. I wanted to print the status of the unit tests to the console, but I didn't want to go down the rabbit hole of SWO communication. I used the debugger to verify that all unit tests passed. All my unit tests were successful. After I completed this, I moved on to using the slider to control the platform. Using our experience with the slider in previous labs, this was quick. Next was the HM control. I added a file to store an array of HM structs and a function to generate them. This was quite quick to write.

I included tests that test some relevant physics engine functions:

- Check if HMs are removed at the top of the screen
- Check if HMs are repelled with no shield
- Check if HMs are repelled with a shield
- Check platform movement
- Check if HMs update correctly

State of where project stands:

This week, I created the physics engine and ensured all unit tests passed with it. I also wrote the file to control platform movement with the slider and the system to generate and store HMs.

Summary effort and estimate numbers:

I have completed **74%** of my currently scoped, estimated work (15.5hr actually spent / 21hr total estimate) in **74%** of the initially-estimated time. (15.5hr estimated for the items I have completed, of 21hr total estimate). For the work that has been completed, I took **1x** (15.5/15.5) as much time as I estimated.

List of in-scope work items:

Completed this week:

- Physics Engine (estimate: 4 hours, actual: 4 hours)

- Platform movement (estimate: 2 hours, actual: 30min)
- Debug failing unit tests (estimate: 1 hours, actual: 1hr 15min)
- HM System (estimate: 2 hours, actual: 30min)

In scope:

- Laser System (estimate: 2 hours)
- Shield System (estimate: 2 hours)
- LEDs (estimate: 1 hour)
- LCD System and Design (estimate: 5 hours)

Out of Scope but Considering for Implementation:

- Menu
- Difficulty Options