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ECEN 3753

## Project HarkonnenPong Week 5

### Unit Testing

#### Platform Motion

- 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 (Pass)
- Test if platform increases velocity when force is applied in the same direction of the velocity (Pass)
- Test if platform decreases velocity when force is applied in the opposite direction of the velocity (Pass)
- Test if low and high force has difference on accelerations (Pass)

#### Holtzman Mass Motion

- Test maintained x velocity of Holtzman Mass (Pass)
- Test constant downward acceleration of Holtzman Mass (Pass)

#### Holtzman Mass Out of Bounds Check

- Test LED flag set when Holtzman Mass crashes (Pass)
- Test if Holtzman Mass is replaced after exiting the range (Pass)
- Test if Holtzman Mass is replaced for a number of times based on a variable (Pass)

### Functional Testing

1. At reset observe that the left LED is blinking at the slowest rate. (Pass)
2. Place your finger on the touch slider and slide your finger to the middle right and observe the platform accelerating rightward. (Fail)
  - a. Release your finger and observe the platform maintaining velocity. (Pass)
3. Slide your finger to the far right before it hits the border and observe the platform accelerating faster rightward. (Fail)
  - a. Release your finger and observe the platform maintaining velocity. (Pass)
4. Slide your finger to the far left before it hits the border and observe the platform decelerating before accelerating leftward. (Fail)
  - a. Release your finger and observe the platform maintaining velocity. (Pass)
5. Press Btn1 and observe the Holtzman Mass count and the y-position of the holtzman mass reset to the top of the screen. (Pass)
6. After pressing Btn1 several times, observe that the button no longer has any effect. (Fail)
7. Move the platform away from the falling Holtzman Mass and observe it activates the game over screen and the right LED blinks at 1 Hz. (Pass)
8. Move the platform in the Holtzman Mass' path and observe it bounce off the platform. (Fail)

- a. Observe after repeated bounces that the peak of the parabola is getting lower. (Fail)
  - b. After several bounces, observe that when the peak is vertically close to the platform that the mass phases through the platform. (Fail)
9. Press Btn0 when the Holtzman Mass is near the platform but hasn't hit it yet and observe that upon bouncing, the peak of the parabola is higher than before. (Fail)
10. Use the slider to match the right and left LED's pwm while the right LED is blinking and observe that the platform will collide with the holtzman mass. (Fail)
11. Bounce the holtzman mass outside of the canyon and observe the same thing happen as what happens when btn1 is pressed. (Fail)

### Functionality Deliverables and Usability Summary

This week I added the function from my unit tests into my main code, and confirmed that the HM now accelerates and can move in the x direction. I set up resetting the HM from pressing btn 1. I also redistributed my capsense and led code to their tasks leaving the lcd with only relevant code inside of its task. All the initial variables have been set and most have been integrated to the functions. I also started running some integration tests and got some to pass.

### Summary effort & estimate numbers

I have completed **41.46%** of my currently-scoped, estimated work time (49.75 actually spent /120hr total estimate) with **80.3%** of the initially-estimated work. (96.44 estimated for the items I have completed, of 120hr total estimate). For the work that has been completed, I took **0.516x** (49.75/96.44) 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.

### In-scope work items

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)
- Configure slider to control LED PWM (est 2 hrs)(actually 3.5 hrs)
- Create Tasks and Test on Segger (est 2 hrs)(actually 2 hrs)
- Slider Testing/Fixing (est 6 hrs)(actually 2 hr)
- Task Diagram Revision for clarification and necessary optimization (est 3 hrs) (actually 2 hrs)
- Laser Implementing (est 1 hr)(actually 1 hr)
- Task Integration Testing (est 10 hrs)(actually 4 hrs)

Completed this week:

- N/A

Significant Partial Completion for estimate numbers:

- HM Physics Unit (est 10 hrs)(5.5 hrs so far)(95% progress complete)

Completed unit tests. Just need bounce conditions.

- Platform Motion (est 1 hr)(5 hrs so far)(93.75% progress complete)

Passed unit test. Implementation remains but the physics unit is there for the platform to use.

- Task Unit Testing (est 10 hrs)(5 hrs so far)(90% progress complete)

All of the unit tests created last week now pass but more could be created for the right led predictions.

- Motion/Position Physics Task (est 10hrs)(5 hrs so far)(85% progress complete)

Physics unit tests passed. Needs implementation of collision physics and platform movement.

- Basic Platform/HM collision (est 2 hrs)(0.25 hrs so far)(50% progress complete)

The Physics task is mostly completed and lower boundaries have been established. Only the

- Platform/HM collision with bounce (est 5 hrs)(2 hours so far)(50% completion)

With the physics function added, the bounce collision can be added through the acceleration parameter and a few new lines of code. Default values of collision physics have also been set.

- Platform Bounce (est 2 hrs)(1 hour so far)(50% completion)

The border that the platform bounces off of has been created and the bounce function has been implemented. Default values of collision physics have also been set.

- Qualification Check/Debugging (est 15 hrs)(2 hours so far)(60% progress complete)

6/16 tests have passed. Many of these tests will pass once the platform is tied to the physics unit which is close to happening.

Not Completed yet:

- Commenting and Code Cleanup (est 5 hrs)
- Platform Interception Prediction LED implementation (est 5 hrs)

## Risks

