

Accurate summary statement of your functionality deliverables and usability so far :

Week 1 : This week I did the project planning, created my task diagram, and identified 2 cutting points and updated the risk registers.

Week 2 : This week I played with Will's Lab7 to learn more about working with the display task and to display a simple image on the screen. I implemented the button and slider task from previous labs to work on the project. I'm also making small progress on the display task, and some platform physics related work

Week 3 : This week I was able to display something on the LCD screen and manipulate it using the buttons. I have implemented the platform physics and tasks. I wrote a comprehensive unit testing code for the platform and also identified my ideal functional tests. I have also made decent progress in programming satchel physics and tasks.

Week 4 : This week I reworked (final update) how I'm going to re-organize my code, I have made the platform working and it is moving left and right with corresponding touches on the slider, stopping at the boundaries etc.. I have also made some adjustments to the new simplified approach for this project , I also coded the shield task and railgun task. I have encountered problems with this and didn't have the time to go through the issues or problems as I was a little bit busy with my capstone project. I will also make a new graph which be pretty heavily modified compared to the one on week #1. The issues currently facing are ITC issues which should be an easy fix, I have also made the LCD drawing ready , but didn't yet integrate with this new approach. Will do so soon after I get that fixed

Summary effort & estimate numbers :

This week I understood even more of the breadth and scope of the project required. I worked on finishing the platform, railgun and shield task .I have also made progress on display testing but wasn't able to integrate with the new and simplified approach. I realized that the old approach had unnecessary elements and some that are not making sense. Once I make this work things should be pretty straightforward from there

I would say that I made about 67.5% progress in the project. I have worked for about 10.5 hours(for week#3) and about 37.5 hrs total. And I estimate that I would need to work for about 37.5 hrs to implement the total project. I have made some decent progres in the current in scope items and would like to have it completed soon

List of in-scope work items (NOT just _this_ week's), **indicating complete or not-yet-complete, along with your estimates of how long you think they will take in total for each :**

- 1) Initial Design for the Project + Task Diagram (3 hrs) : **Complete**
- 2) Implement Button ISR (5hrs) : **Complete**
- 3) Implement the Slider functionality (1 hr) : **Complete**
- 4) Implement LCD Task (7 hrs) : **Complete/Partial**
- 5) Implement LED Task (5 hrs) : **Not complete**
- 6) Implement Platform Task(6 hrs) : **Complete**
- 7) Implement Shield Task (8 hrs) : **Partial Complete**
- 8) Implement RailGun Task (5hrs) : **Complete**
- 9) Implement Slider Physics (4 hrs) : **Complete**
- 10) Implement Satchel Physics (5 hrs) : **In progress- Gathering relevant equations+info(Complete)**
- 11) Implement Rail_Gun Physics(4 hrs) : **In progress**
- 12) Implement + Integrate with the main Physics Task (9 hrs) : **Not complete**
- 13) Debugging + Testing (10 hrs) : **Not complete**
- 14) Extra Items (3 hrs) : **Not complete**

Completed Items Summary :

Implement button ISR : I finished this work in my in scope list as I felt that buttons functionality and setup is a major important one to finish before we can talk about the overall functionality of the various tasks and physics setup. This took about 1.5-2 hrs and was little easy as most was utilized from previous labs.

Implement Slider functionality : Again another important setup. Implementing the functionality and integrating with the capsense.c file . This will help me to develop the platform task along with the slider physics. This took me about 1 hour to complete and was again utilized mostly from previous labs.

Mutexes. Task setup etc. : This kinda took a little bit of time as I implemented it from understanding the project in total and what's necessary for the essential functioning of the project. This took me about 4 hours to complete.

LCD Task : This in its initial stage seems complete but now I have to play around and implement the various shapes and lines to be displayed. I played mostly with Will's Lab7 for the display and understood how to work with the LCD for this task. This took me about 3.5-4 hours to complete.

Satchel/Slider Physics : (Not complete) : Even though I haven't started the implementation of the physics for both the slider and the satchel. I have started looking at the various information and information required to implement. I'm currently at the end stages of finalizing this necessary information. This took me about ~2 hours to plan and understand these items.

Platform Physics : (Complete) : I have tested it out thoroughly and it is indeed working as I would like to but again I have to test this out with my new implementation. But in general I was able to move it with necessary force, stopping at the boundary conditions and performing as it should be.

Shield Task : (Complete) : I have finished coding for the shield task as to when it gets activated and then it gets discharged. I will be testing this again soon and will report back with the necessary updates and results

RailGun Task : (Partial Complete) : I have finished the code for railgun along with the physics partially , now I just have to integrate with the castle physics and it should be good. I will again report the results and update on it soon

Unit Testing (Code Uploaded in github):

Comprehensive Platform Physics Testing

- 1) To test when the platform is at the resting position and that no acceleration or anything is provided (**Pass**)
- 2) To test when the platform moves right when no acceleration provided (**Pass**)
- 3) To test when the platform moves left when no acceleration provided (**Pass**)
- 4) To test when the platform moves right when some acceleration is provided (slow) (**Pass**)
- 5) To test when the platform moves left when some acceleration is provided (slow) (**Pass**)
- 6) To test when the platform moves right when high acceleration is provided (fast) (**Pass**)
- 7) To test when the platform moves left when high acceleration is provided (fast) (**Pass**)
- 8) To test when the platform is destroyed (**Fail**)
- 9) To test when the platform encounters the right bounds and comes to a halt (**Fail**)
- 10) To test when the platform encounters the left bounds and comes to a halt (**Fail**)

Functional Testing :

- 1) To make sure when the game starts corrects things like canyon walls, platform and the castle is displayed : **Partial Pass - Fail with new approach**
- 2) When pressing left or right the platform moves left or right with a specified force : **Pass**
- 3) When pressing the button railgun ejectile is shown : **Fail**
- 4) The satchel is bouncing off the canyon wall : **Fail**
- 5) Tasks Functionality and everything is working properly : **Fail**
- 6) To get something to display on the LCD and manipulate through buttons or slider : **Pass**
- 7) Rail Gun ejectile physics is working properly : **Fail**
- 8) Game management system is working properly with proper win/lose scenarios : **Fail**

- 9) Press Btn 1 to discharge and destroy the incoming satchel : **Fail**
- 10) Make sure the castle physics is working properly and taking the hits etc. properly : **Fail**

(New Updates to Functional Testing) :

- 1) Integrate Shield physics with Castle Physics : **Not Started**
- 2) LEDs functioning properly with the physics : **Not Started**
- 3) Satchel bouncing on the satchel : **Not Started**
- 4) Rail Gun shooting and updating scoreline properly : **Not Started**