**Weekly Tasks Time Estimates:**

Add satchel throwing functionality and hit detection

Estimate: 3 hours

Actual: 3 hours

Update display with object blocks struck by satchels and slugs removed

Estimate: 2 hours

Actual: 1 hour

Add health tracking of platform to gui and game over screen

Estimate: 1 hour

Actual: 1.5 hours

Add maximum platform bounce speed

Estimate: 30 minutes

Actual: 1 hour

Implement individual timers for physics and display

Estimate: 1 hour

Actual: 1 hour

Implement data protection mutexes across tasks

Estimate: 1 hour

Actual: 3 hours

Develop shield functionality and GUI representation

Estimate: 2 hours

Actual: 1 hour

Add LEDs functionality

Estimate: 1 hour

Actual: 1 hour

**Project Status**

All of the required functionality for my project has been completed. There is still some debugging that remains within those tasks, and I would like to add some of the extra features described in the instructions. Therefore, I now estimate that my project is 80% complete. My development has been smooth and linear up to this point, though I suspect that the debugging stage will be the most difficult to finish. The satchels are thrown and behave as required now. The health of the foundation and the castle are both monitored and if they are sufficiently reduced, an evacuation is triggered. The evacuation is indicated by LED1 blinking. All of the parameters for the display objects, game parameters, and physics values are controlled via structs. The current LCD is shown in fig. 1 below.

A screenshot of a computer

Description automatically generated with low confidence

Figure 1: Current LCD display

As of now two issues have been identified that will be addressed in the coming week. The first is that the capacitive touch sensor begins having fake input as mutexes are added for data protection. As the number of mutexes increases, so does the frequency of fake inputs. The second issue is how to light LED0 dimly to indicate a weak force and as opposed to the bright lighting for a strong force. Table 1 is an updated list of the current project status and tasks remaining.

|  |  |  |  |
| --- | --- | --- | --- |
| **Task** | **Time Estimate** | **Actual Time Used** | **Status** |
| Task Diagram | 3 hours | 5 hours | Complete |
| Physics hand examples | 3 hours | 3 hours | Complete |
| Write Input Tasks | 5.5 hours | 7.5 hours | Complete |
| Write Physics Tasks | 8 hours | 8.5 hours | Complete |
| Write Display Tasks | 8 hours | 5.5 hours | Complete |
| Integrate Tasks | 3 hours | 1 hour | Partially Complete |
| Debug Final Code | 5 hours | 3 hours | Partially complete |

Table 1: Project Progress

**Functional Tests:**

Buttons:

* If button 0 is pressed it triggers an interrupt, which then increments the charge level of the capacitors every 1 second while it is held.
  + pass
* If button 0 is released an interrupt is triggered. This then sets the capacitor energy counter to zero and indicates that a fire operation is required.
  + pass
* If button 1 is pressed while the capacitor energy level is zero, nothing happens.
  + pass
* If button 1 is pressed while the capacitor energy level is greater than zero, the capacitor energy counter is set to zero and it indicates that a shield operation is required.
  + pass
* When button 1 is released, no additional interrupt is generated and is ignored as input.
  + pass

Slider:

* The slider’s input is periodically sampled.
  + pass
* If the slider is touched the variable tracking what level and direction of force is required is set.
  + pass
* If the slider is not being touched, the tracking variable is reset to a no applied force state.
  + pass

Physics

* task runs periodically
  + pass
* calculations maintain a precision of at least 1/100.
  + Pass

Display

* Platform does not move through walls
  + Pass
* Slug size changes with given size parameter
  + Pass
* Slug follows a parabolic flight path according to physics calculations
  + Pass
* Satchels fly at random angles
  + Pass
* Satchels detonate when striking any horizontal surface
  + Pass
* Satchel follow parabolic flight path according to physics calculations
  + Pass
* Button 0 charges capacitor bar
  + Pass
* Button 1 resets capacitor bar while charging
  + Pass

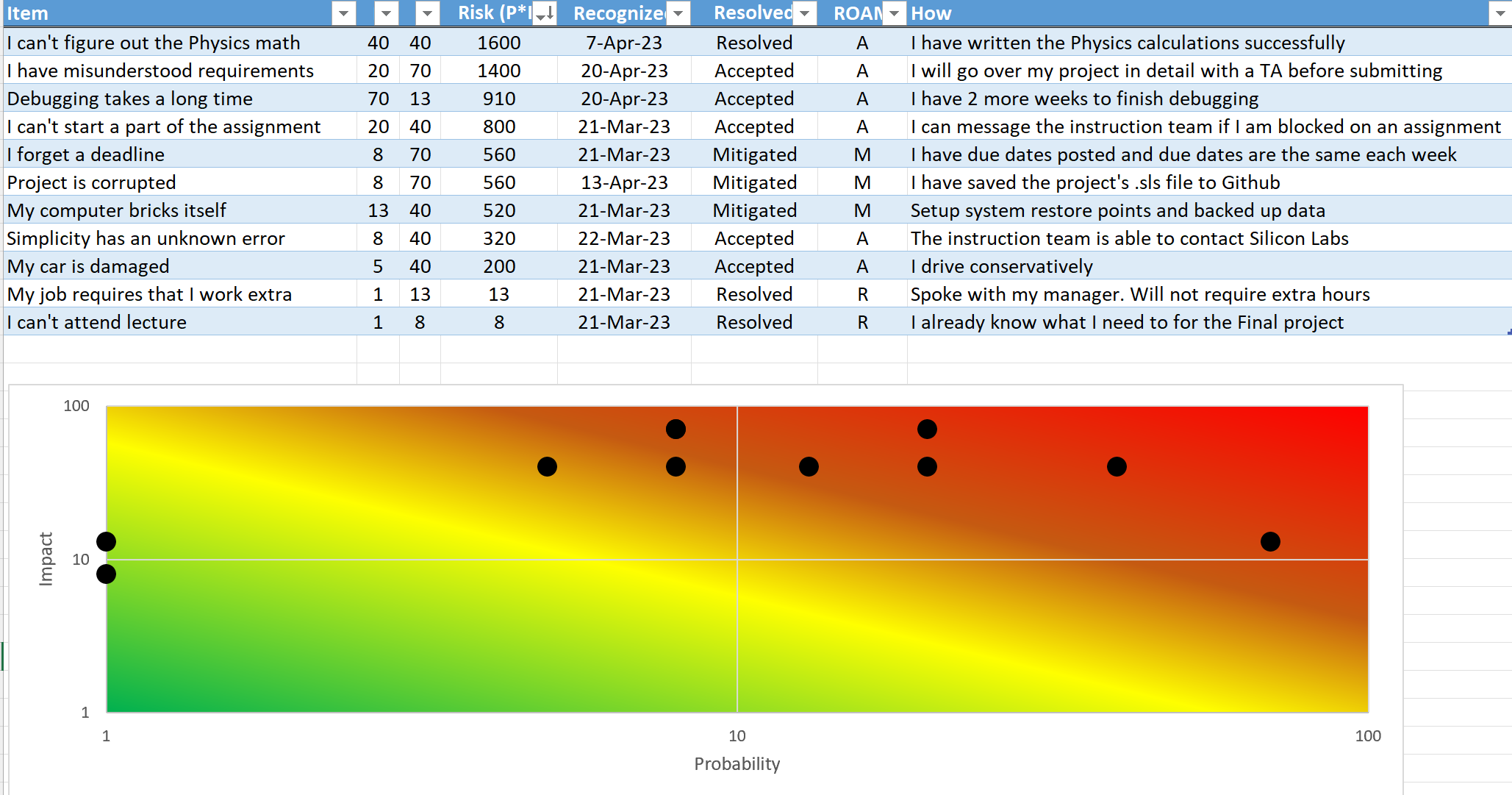
Castle

* Impacts by a slug are accurately tracked
  + Pass
* Impacts are displayed on the LCD
  + Pass

LEDs

* Force being applied indicated
  + Pass
* Escape of prisoners is indicated
  + Pass

**Risk Register**

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