**Revealing Roc**

**Story behind Revealing Roc**

Roc is an individual who contains many secrets, however to unlock such secrets you must solve one of Roc’s several puzzles. One of her puzzle’s is called **Revealing Roc.** It requires you to find a Roc Bulb 3 times, however you only have 3 tries to do so.

**Objective**

The objective of the puzzle is to move through a 4x4 board to find the Roc Bulb 3 times.

**Controls**

**2-Axis Joystick**

Moves the player’s current position up, down, left, right; respectively in the direction in which they move the joystick

**Switch button**

Pressing the **button** checks to see if the player’s current position is where the Roc Bulb is hidden.

**Hardware**

The following hardware devices were used in creating **Revealing Roc**:

* 6x LEDs
  + 3 Red (indicating the player’s lives)
  + 3 Green (indicating the player’s lives)
* 1x 4x4 WS2812B LED Matrix
  + The game board
* 1x Switch
  + The button that submits the player’s guess.
* 1x 2-Axis Joystick
  + Allows the player to move across the board
* 1x Seven-segment display
  + Displays a set of characters after the player obtains 3 points.
* 1x 74HC595 shift bit register
  + Used to display the secret message.
* 1x Arduino nano
  + Controls the behavior of the hardware being used

**Software**

**RevRoc Library**

* The RevRoc library simulates the LED Matrix
* Maintains the position of the target and player throughout the game. It also maintains the number of lives and points the player has throughout the puzzle.
* Returns the values that indicates the position of the player and target.
* Returns the values that indicate the lives and points throughout the game.

**RevRoc Sketch**

* Obtains the direction in which the player wants to move
* Listens out for the user to press the guess button.
* Displays the player’s current position throughout the game
* Utilizes the LEDs to notify the player of their lives and points.
* Displays the target’s position when the game comes to an end.

**Challenges**

Throughout designing this project I ran into several challenges. One the of the challenges that I faced was developing the library to manage both the mapping of the LED Matrix and the display of the current’s position. I faced this challenge by making the library focused solely on: the mapping of the LED Matrix, the position of the player and target, along with the amount of lives and points the player has.