

# **8X8 LED Battleship Game**

## **153B Final Project Proposal**

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### **Overview**

We propose to make a single player battleship game using the LPC Microcontroller and two 8x8 RGB LED matrices. The goal for the user is to simply sink all of the CPU's battleships before the CPU sinks theirs. We will need two LED matrices because one will be used to setup the user's battleships and the other will be used for targeting the CPU's battleships. The joystick will be used to position the battleships and for selecting coordinates while the push buttons will be used to start and stop the game and change the orientations of the ships. The start of the game will be indicated by all of the LEDs glowing blue and the end of the game will be indicated by all of the LEDs glowing green if the user wins and red if they lose. The LEDs will glow green to indicate the positions of the user's ships, blue to indicate a miss, and red to indicate a hit.

### **Peripherals**

1. Two 8x8 RGB LED Matrices
2. Push Buttons
3. Joy Stick

### **Software Design**

The CPU will choose targets at random (pseudo-randomly). We can later make the CPU smarter by adding more logic (e.g. hit an adjacent LED after a hit). We will use mainly GPIO interrupts to make the features of the game.

### **Goals**

- LEDs glow the appropriate color based on the user's input
- The CPU is able to select positions on the user's board and sink ships and the user can do likewise
- Properly implement game mechanics

### **Responsibilities**

Justin and Howard will be responsible of the game logic/flow control and Junayed will be responsible for handling all the GPIO interrupts and ensuring that the LED matrices behave appropriately.