

# Breakout! 8x8 LED Matrix Game

## ECE 153B Final Project Proposal

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### OVERVIEW

We propose to write a one player game (Breakout!) for the LPC1115 Microprocessor and an 8x8 LED Matrix Display. The game will use the left and right push buttons to control a paddle (2 dots wide) that moves across the lowest row of the 8x8 LED matrix and a bouncing ball will start in the center of the grid, where it will drop down towards the paddle. The center button will reset the game.

### Peripherals

1. 8x8 LED Matrix ( <https://www.adafruit.com/products/956> )
2. Buzzer ( On Project Board )
3. LEDs ( On Project Board )
4. 7 Segment LED (On Project Board)
5. Board Cover ( A cardboard cutout for Experiment board, that shows what the LEDs mean)

### Software Design

A single while loop will control the entire program. Inside of the while loop the Push Buttons will be read, followed by an update to the 8x8 LED Display. The 7 Segment LED will only be updated upon player death. The Victory RBG Led will only change color upon completion of a level. The Red LED's will be off, until the player dies. The Buzzer will cause the code to switch to a different section that handles playing sounds.

### Goals

1. 3 Levels of the game - Speed increases with each level
2. Striking out a block causes beep from Buzzer
3. Victory RBG LED Flashing through colors, and musical tune from Buzzer.
4. 2 Lives for the Player - Indicated by 7 segment LED.
5. Lose - Red LED's Flashing, and Sad music from Buzzer.

### Group Responsibilities

Carrie is responsible for programming the 3 levels and the speed increase of the bouncing ball. She will help with the Victory state detection. Both team members will work together to determine collision states. Will is responsible for the Victory LED, the 2 lives of the player and the Death with Red LEDs flashing. Both members will work on the Buzzer sounds. Both members are responsible for making sure the game is responsive and does not have detection trouble.