

# Connect Four LED Matrix Game

## ECE 153B Final Project Proposal

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### OVERVIEW

We propose a two player game based on the popular analog game connect four. The 6x7 connect four board is simulated through the 8x8 LED multicolor matrix with one of the top rows being the staging area for the player's next move and the far right column being unused by the game. The player uses the joystick onboard to control where to drop their game piece and uses a pushbutton onboard to drop the game piece. Upon connecting four game pieces, the LED matrix will flash the winning players color and then reset to a new game. If there is a draw, the color designated for a draw will flash on the screen and then the game will reset.

### PERIPHERALS

1. 8X8 Bicolor LED Matrix (<https://www.adafruit.com/product/902>)
2. Joystick (On Project Board)
3. Push-button (On Project Board)

### SOFTWARE DESIGN

The game will exist inside of a while loop. Interrupts will handle user input from the joystick and the pushbuttons to trigger actions on the LED matrix. Inside of the while loop, the software will check for new inputs and check to see if the new input is a game winning move and will flash the screen accordingly. The current placement of game pieces will be stored in a C matrix and will be cleared (along with the LED matrix) upon the game ending. The flashing screen will be controlled by an LPCTimer.

### GOALS

1. The two players will be marked by green and red LED's.
2. The current player's color flashes in the top row corresponding to the column that their color piece will be added to.
3. The joystick will be used to control which column to insert into, and the push button will be used to confirm the selection.
4. When a player has four of their color in a row (vertical, horizontal, or diagonal), their win will be marked by the entire board flashing their color.
5. In the event of a draw, the entire board will flash yellow.

### GROUP RESPONSIBILITIES

Reed is in charge game logic while ANDrew will handle most of the peripheral setup.