

LOCK n LOCK! Pattern Operated Door Lock

ECE 153B Project Proposal

By Maga Kim and Sung In Kim



Overview:

Our project proposal includes a door lock which opens with a password input. The password consists of a pattern which will be shown visually by an 8x8 LED matrix connected via I2C. The LPC board's joystick will be used to draw a pattern which will then be inputted as a password by pushing a button. Our stretch goal is to add a bluetooth peripheral and implement code which only allows the door lock to function when a given bluetooth address is connected.

Peripherals:

1. Door lock powered by Servo motor
2. LPC4088 Board
3. 8x8 LED matrix with I2C backpack
4. Joystick (on the LPC4088 Board)
5. Button (on the LPC4088 Board)

Software Design:

Initially any password will be set by drawing onto the LED matrix. The matrix value will be stored in a double array which will be checked against the current state of the matrix when a GPIO button is pushed. If the saved matrix "image" matches that of the current state of the matrix, the matrix will blink once and the lock will be unlocked until the GPIO button is pressed. If the image does not match, then the matrix will blink twice and reset. The lock operates by providing power when a selection signal is high. An integer will be used to store the current row/column value of the joystick's path to light up the LEDs on user input. This value will reset to 0/0 on reset of the matrix.

Goals:

1. Configure output control signal from board to activate lock
2. Set up I2C LED matrix and traverse the matrix using the joystick
3. Compare current high values on LED matrix to that of a stored value

Stretch goal: Set up a bluetooth peripheral which will prevent door lock function if not connected to a known bluetooth address

Group Responsibility:

Maga will set up interfacing to the LED I2C display via joystick. Sung In will set up the lock's functionality and pattern comparison behavior. If the time is allowed, we will implement the bluetooth peripheral together.