# 4/7/2025

used test code to observe button behavior, LED to be turned off upon 3 presses

MEASUREMENTS

LED
$V_{gpio3, on} = 2.971 V$         $V_{gpio3, off} = 0.107 mV$

button
$V_{gpio6, unpressed} = 3.285 V$    $V_{gpio6, pressed} = 0.028 mV$

PCB V1 screen test:

### SPI pin configuration

IO9:   HD    using as RST
IO10:  CSO   using as CS
IO11:  D     using as MOSI
IO12:  CLK   using as SCK
IO13:  Q     using as MISO
IO14:  WP    using as DC/RS

### under User_Setup.h, #define...

TFT_MISO   13
TFT_MOSI   11
TFT_SCLK   12
TFT_CS     10
TFT_DC     14
TFT_RST    9

issue: no GPIOs work, screen doesn't display, & serial monitor prints garbage
when trying to implement screen

fix: uncomment    #define USE_HSPI_PORT    in    User_Setup.h

**04/09/2025**

LED array lighting code rework

- misunderstood the general idea of how we want to light the LED arrays

want them to be lit more like a progress bar or battery charge indicator

class size defined by professor or connected devices

buttons 1-5 on student interface for understanding level

15 sets of LEDs to be lit

$$\text{understanding} = \frac{1 \cdot \text{\# of 1 responses} + 2 \cdot \text{\# of 2 responses} + \ldots + 5 \cdot \text{\# of 5 responses}}{5 \cdot \text{class size}}$$

Red 1:    $0 \leq \text{understanding} \leq 0.07$
Red 2:    $0.07 < \text{understanding} \leq 0.13$
Red 3:    $0.13 < \text{understanding} \leq 0.20$
Red 4:    $0.20 < \text{understanding} \leq 0.26$
Red 5:    $0.26 < \text{understanding} \leq 0.33$
Yellow 1:    $0.33 < \text{understanding} \leq 0.40$
Yellow 2:    $0.40 < \text{understanding} \leq 0.47$
Yellow 3:    $0.47 < \text{understanding} \leq 0.54$
Yellow 4:    $0.54 < \text{understanding} \leq 0.60$
Yellow 5:    $0.60 < \text{understanding} \leq 0.66$
Green 1:    $0.66 < \text{understanding} \leq 0.73$
Green 2:    $0.73 < \text{understanding} \leq 0.80$
Green 3:    $0.80 < \text{understanding} \leq 0.87$
Green 4:    $0.87 < \text{understanding} \leq 0.94$
Green 5:    $0.94 < \text{understanding} \leq 1$

# 4/12/2025

worked on 3D model for hub housing prototype