OLED + Integration

Huaishu Peng | UMD CS | Fall 2023

Digital Input/Output

Analog Input/Output

Motor / Ultrasound

IMU

Shift Register

3D Modeling

Laser Cutting

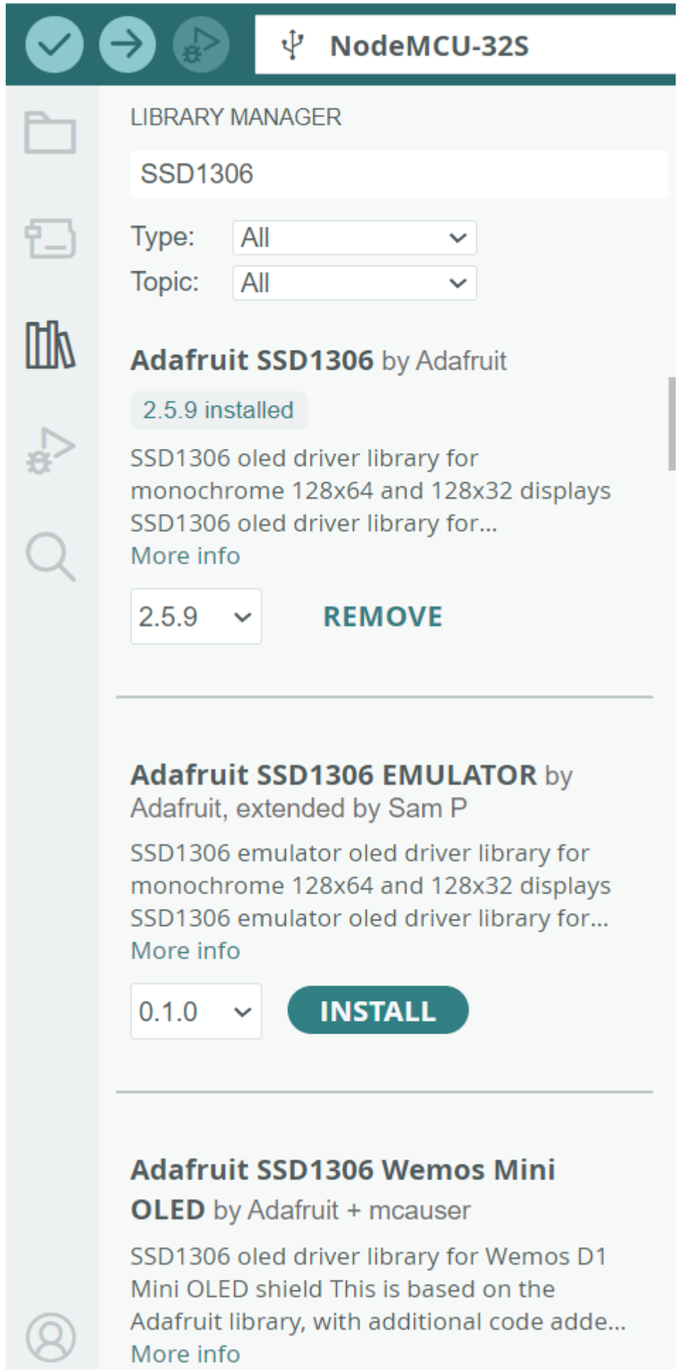
...

+

0.49 Inch OLED Display Module

128×32
I2C Interface
4 Pin
3.3-5V
SSD1306 - single-chip CMOS OLED/PLED driver

Install Adafruit SSD1306 Library (also Adafruit_GFX)



Adafruit SSD1306

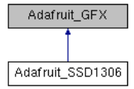
Main Page | Classes | Files

Adafruit_SSD1306 Class Reference

Class that stores state and functions for interacting with SSD1306 OLED displays. More...

```
#include <Adafruit_SSD1306.h>
```

Inheritance diagram for Adafruit_SSD1306:



Public Member Functions

Adafruit_SSD1306 (uint8_t w, uint8_t h, TwoWire *twi=&Wire, int8_t rst_pin=-1, uint32_t clkDuring=400000UL, uint32_t clkAfter=100000UL)
Constructor for I2C-interfaced SSD1306 displays. More...

Adafruit_SSD1306 (uint8_t w, uint8_t h, int8_t mosi_pin, int8_t sclk_pin, int8_t dc_pin, int8_t rst_pin, int8_t cs_pin)
Constructor for SPI SSD1306 displays, using software (bitbang) SPI. More...

Adafruit_SSD1306 (uint8_t w, uint8_t h, SPIClass ***spi**, int8_t dc_pin, int8_t rst_pin, int8_t cs_pin, uint32_t bitrate=8000000UL)
Constructor for SPI SSD1306 displays, using native hardware SPI. More...

Adafruit_SSD1306 (int8_t mosi_pin, int8_t sclk_pin, int8_t dc_pin, int8_t rst_pin, int8_t cs_pin)
DEPRECATED constructor for SPI SSD1306 displays, using software (bitbang) SPI. Provided for older code to maintain compatibility with the current library. Screen size is determined by enabling one of the SSD1306_* size defines in **Adafruit_SSD1306.h**. New code should NOT use this. More...

Adafruit_SSD1306 (int8_t dc_pin, int8_t rst_pin, int8_t cs_pin)
DEPRECATED constructor for SPI SSD1306 displays, using native hardware SPI. Provided for older code to maintain compatibility with the current library. Screen size is determined by enabling one of the SSD1306_* size defines in **Adafruit_SSD1306.h**. New code should NOT use this. Only the primary SPI bus is supported, and bitrate is fixed at 8 MHz. More...

Adafruit_SSD1306 (int8_t rst_pin=-1)
DEPRECATED constructor for I2C SSD1306 displays. Provided for older code to maintain compatibility with the current library. Screen size is determined by enabling one of the SSD1306_* size defines in **Adafruit_SSD1306.h**. New code should NOT use this. Only the primary I2C bus is supported. More...

~Adafruit_SSD1306 (void)
Destructor for **Adafruit_SSD1306** object.

bool **begin** (uint8_t switchvcc=**SSD1306_SWITCHCAPVCC**, uint8_t **i2caddr**=0, bool reset=true, bool periphBegin=true)
Allocate RAM for image buffer, initialize peripherals and pins. More...

void **display** (void)
Push data currently in RAM to SSD1306 display. More...

void **clearDisplay** (void)
Clear contents of display buffer (set all pixels to off). More...

void **invertDisplay** (bool i)
Enable or disable display invert mode (white-on-black vs black-on-white). More...

void **dim** (bool dim)
Dim the display. More...

void **drawPixel** (int16_t x, int16_t y, uint16_t color)
Set/clear/invert a single pixel. This is also invoked by the Adafruit_GFX library in generating many higher-level graphics primitives. More...

virtual void **drawFastHLine** (int16_t x, int16_t y, int16_t w, uint16_t color)
Draw a horizontal line. This is also invoked by the Adafruit_GFX library in generating many higher-level graphics primitives. More...

virtual void **drawFastVLine** (int16_t x, int16_t y, int16_t h, uint16_t color)
Draw a vertical line. This is also invoked by the Adafruit_GFX library in generating many higher-level graphics primitives. More...

void **startscrollright** (uint8_t start, uint8_t stop)
Activate a right-handed scroll for all or part of the display. More...

void **startscrollleft** (uint8_t start, uint8_t stop)
Activate a left-handed scroll for all or part of the display. More...

void **startscrolldiagright** (uint8_t start, uint8_t stop)
Activate a diagonal scroll for all or part of the display. More...

void **startscrolldiagleft** (uint8_t start, uint8_t stop)
Activate alternate diagonal scroll for all or part of the display. More...

void **stopscroll** (void)
Cease a previously-begun scrolling action. More...

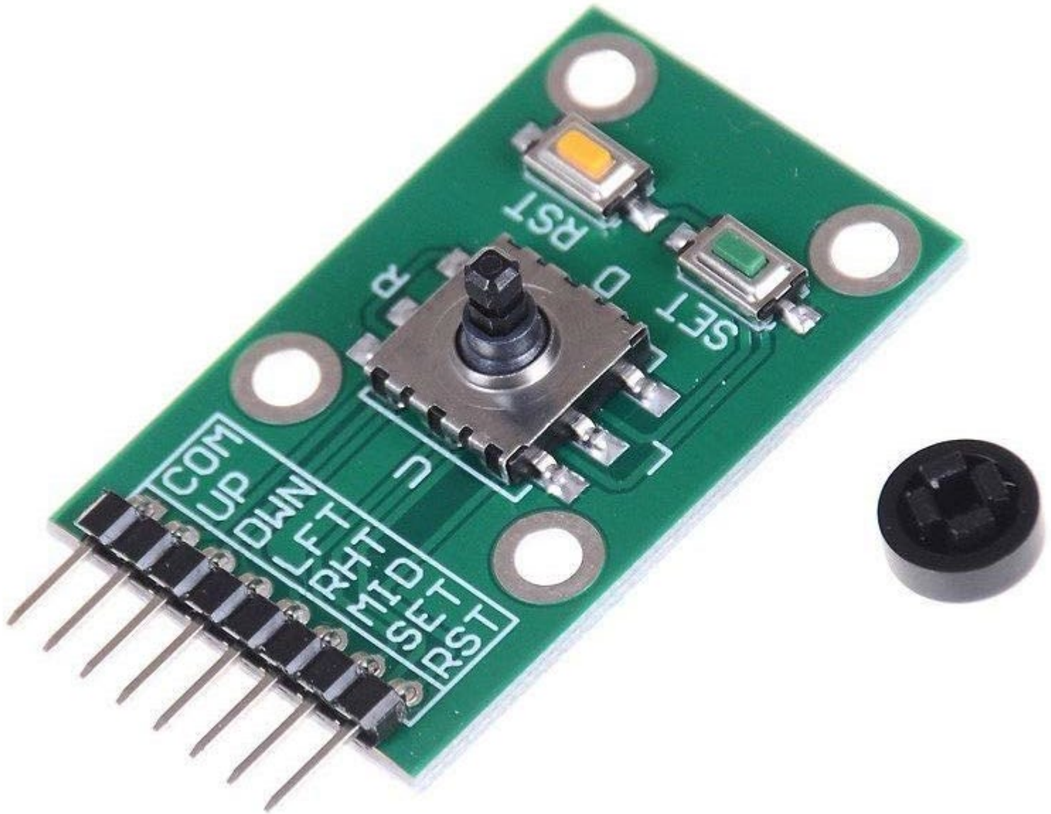
10 min: Complete the circuit, Install the driver,
test the example ssd1306_128x32_i2c

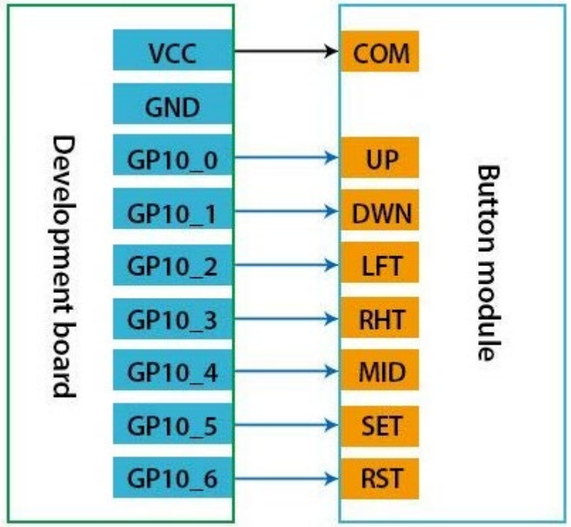
https://adafruit.github.io/Adafruit_SSD1306/html/class_adafruit___s_s_d1306.html

Light up one pixel

```
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>

#define SCREEN_WIDTH 128 // OLED display width, in pixels
#define SCREEN_HEIGHT 32 // OLED display height, in pixels

#define OLED_RESET     -1 //
#define SCREEN_ADDRESS 0x3C // 0x3C for 128x32

Adafruit_SSD1306 display(SCREEN_WIDTH, SCREEN_HEIGHT, &Wire, OLED_RESET);

void setup() {
  display.begin(SSD1306_SWITCHCAPVCC, SCREEN_ADDRESS);

  display.clearDisplay();
  display.display();
}


void loop() {

  display.drawPixel(SCREEN_WIDTH/2, SCREEN_HEIGHT/2, WHITE);
  display.display();

  delay(10);
}
```

Five Direction Button Module

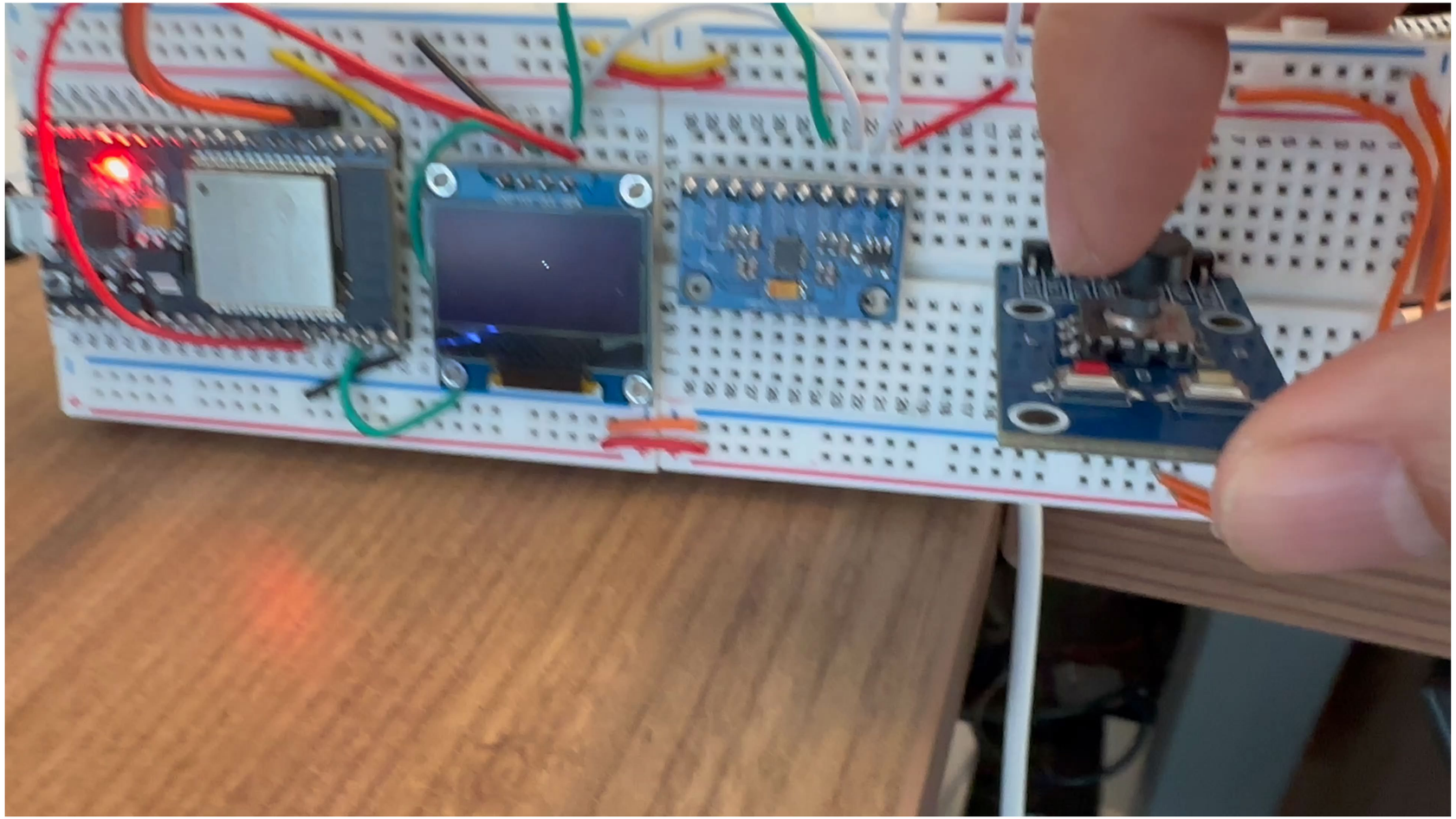




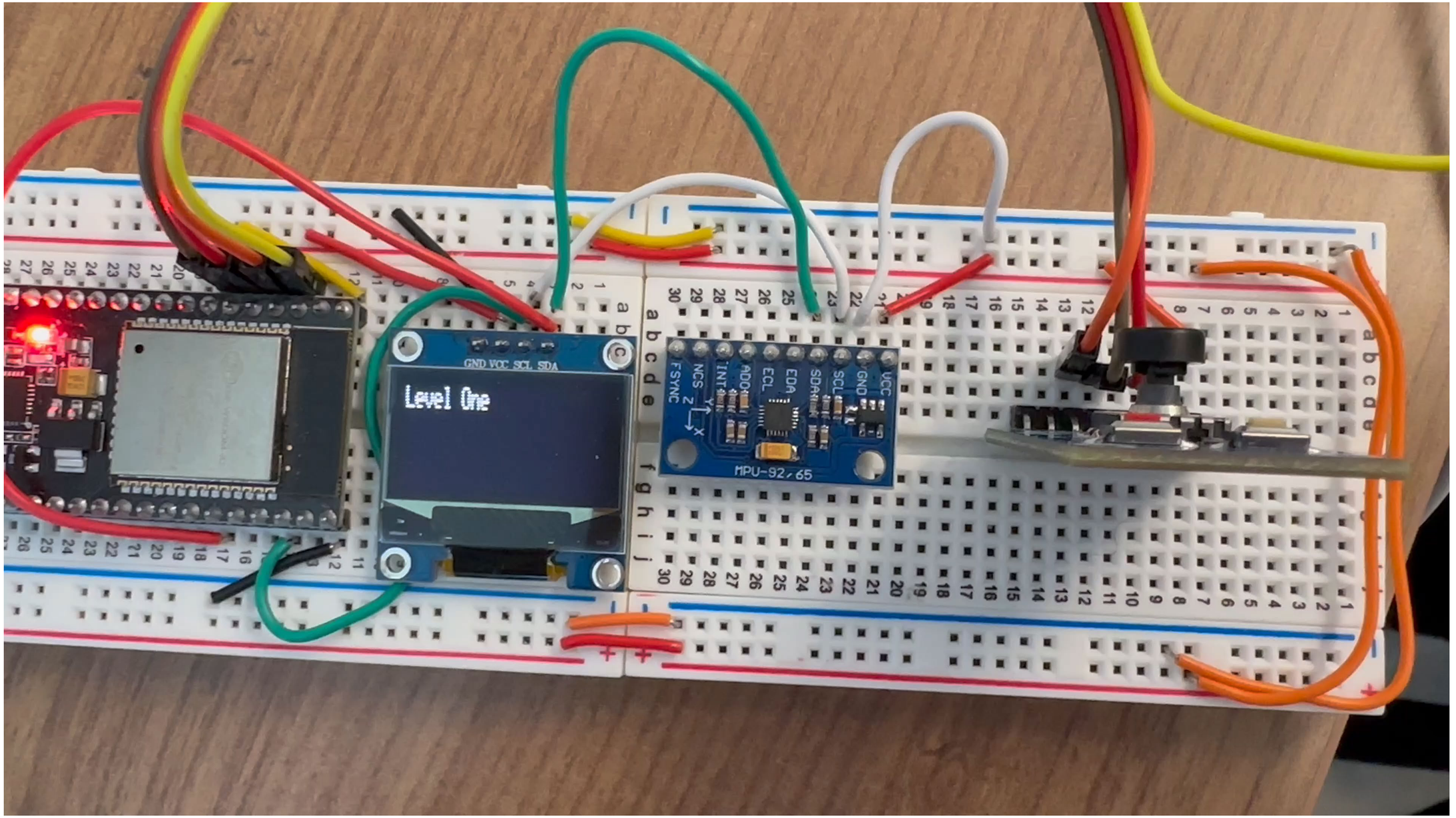
Any GPIOs

10 min: Write a testcode to test the functionality of the 5-direction joystick

20 min: Write a simple game where you can use the joystick to control the movement of the pixel on the display



Assignment:


GND VCC SCL SDA
Level One
MPU-9265
VCC
GND
SCL
SDA
EDA
ECL
ADO
INT
NCS
FSYNC