Project 1: Interfacing OLED display to Raspberry Pi

Project 2: Student proposed project (subject to lecturer's approval)

Students are required to do either Project 1 or Project 2. The marks will contribute 50% to the module mark.

The level of Project 2 should be comparable to that of Project 1.

Deliverables: Additional hardware, software, project report, a demo video (less than 2 minutes)

Project 1: Interfacing OLED display to Raspberry Pi

Hardware required: RPi board, 1.8" OLED display, DHT 11 temperature and humidity sensor, and PIR Sensor

0.96", 1.14", and 1.44" Displays

- **Vin** connects to the Raspberry Pi's **3V** pin
- **GND** connects to the Raspberry Pi's **ground**
- **CLK** connects to SPI clock. On the Raspberry Pi, thats **SLCK**
- **MOSI** connects to SPI MOSI. On the Raspberry Pi, thats also **MOSI**
- **CS** connects to our SPI Chip Select pin. We'll be using **CE0**
- **RST** connects to our Reset pin. We'll be using **GPIO 24** but this can be changed later.
- **D/C** connects to our SPI Chip Select pin. We'll be using **GPIO 25**, but this can be changed later as well.
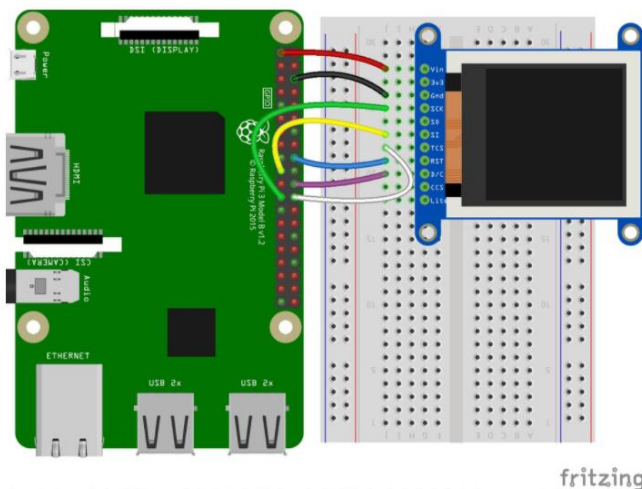
Physical Pins on RPi	Pins on Display Module	Function of display pins
3V3	VCC	3.3V
GND	GND	Ground
pin 19	SDA	Data input
pin 23	SCL	SPI clock
pin 24	CS	Chip Select (low true)
pin 22	DC	Data/ $\overline{\text{Command}}$
pin 18	RES	Reset
3V3	BL	Back light

Refer to Lab 5 for details to setup the ST7735 display for Raspberry Pi.

What you need to do?

Write a program in python to display:

1. The current timestamp
2. The current temperature (XX degree C)
3. The current temperature (XX degree F)
4. The current humidity (XX%)
5. The PIR sensor status

All OLED display output should also be printed on the Python Shell in IDLE.

Students are encouraged to add enhancement or new features to his/her project other than those listed above. (Bonus marks will be given.)

What do you need to submit?

1. A project report (hardcopy submitted to your lecturer), with explanation of the followings:
    a. Introduction of project, system block diagram, circuit diagram and suggested applications
    b. Python codes.
    c. Screen outputs of your result
    d. Problem Solving and Further Improvements
2. A short video (less than 2 minutes) to demonstrate your project.
3. Zip the software copies of project report, python source files and demo video into ONE .zip file and upload to Moodle.