# Data Logging , IoT and Display

## 0.REQUIREMENTS

HDMI to VGA converter
Raspberry pi
Memory card
Power cord for mobile
LAN cable
Monitor

## 1.Booting up Raspberry pi

- Format the SD card with SD Card Formatter - https://www.sdcard.org/downloads/formatter_4/eula_windows/
- Download Etcher (to flash) - https://www.balena.io/etcher/
- Download raspbian IMage to flash on Rpi - https://www.raspberrypi.org/downloads/raspbian/
- Flash Raspbian with Etcher on Sd card
- Put the SD card in the pi and connect HDMI to VGA and power up the pi

you will be directly taken to the desktop

If you don't see the display make sure you inserted SD card and HDMI cable properly.
The Red light should be on continuously else the problem is with power cord.
The yellow light should be blinking ,if it blinks for 3 to 4 sec and then it gets off then the problem is with SD card ,try reflashing the raspbian ,if that does not help the SD card is damaged.

## 2.Configuring Rpi

A. sometimes when you connect the mouse you will feel the lag
    1. Type into Command line in the terminal:
    2. sudo nano /boot/cmdline.txt

3. add onto the end of the line "usbhid.mousepoll=0"  ((note if still slow on 0 try 1)), without quotes
4. save the file, then: sudo reboot

B. Resize the display icon and taskbar setting according to the display and need (my is 3.2 inch display) refer pdf
C. sudo apt-get update and sudo apt-get upgrade and sudo rpi-update
D. Enable SSH , SPI , I2C etc from raspberry pi configurations
    1. goto > start > preferences > raspberry pi configurations > interfaces > enable all
E. connect to the wifi
F. Check for the red LED if its blinking (only in case of rpi 3 b other models of rpi may differ in it)
    1. then there may be some issues of power supply due to low quality power cable
    2. https://www.reddit.com/r/raspberry_pi/comments/4b7hge/rpi_3_red_led_blinking/
    3. use above link forum
G. checking the voltage
    1. https://raspberrypi.stackexchange.com/questions/33164/my-pi2-wont-boot-how-do-i-check-measure-the-voltage-on-a-pi2

## 3.Windows Setup And SSH to Rpi

Now we need to ssh into the Rpi with our laptop to work on the project

- Install MobaXterm - https://mobaxterm.mobatek.net/download.html
- We will be needing 3 apps
- 1)Fing - https://play.google.com/store/apps/details?id=com.overlook.android.fing&hl=en_IN

- 2)VNC Viewer Remote Desktop - https://play.google.com/store/apps/details?id=com.realvnc.viewer.android
- 3)JuiceSSH SSH Client - https://play.google.com/store/apps/details?id=com.sonelli.juicessh
- Now connect Rpi to the wifi (for Rpi 3 B+) or ethernet (for Rpi B+) of modem and connect the android phone to the same network (i.e. to the same wifi)
- Open Fing app and press refresh by this we will get all the devices connect to the network and it also specifies the IP address of all the devices
- Note down the IP address of the Rpi Device
- Now open MobaXterm > Click on “Session” > Click on “SSH” > In “Remote host” put the IP address of the Rpi which we noted down and Specify username (optional) and let the port be default. > Click “OK”
- You will be asked for the password of the user. Default Password is “raspberry”.Once you enter the password you will be logged in and can do anything with the command line.
- You will have a small file manager on the Left of the command Line window.
- Basic things to do first
    - To start a Visual GUI command is “startlxde”.
    - sudo apt-get update
    - Sudo apt-get upgrade

(To BE reviewed)

I. SETTING UP 3.2 INCH DISPLAY
   A. download the driver from link "https://goo.gl/UEb3zV"(this is for 3.5 inch) or in the folder(3.2 inch)
   B. copy to /home/pi
   C. now run the commands in the pdf
   D. also in display edit the "cmdline.txt" file in folder "LCD-show" to add "usbhid.mousepoll=0" at the end of the file

II. SETTING UP THE DISPLAY BY ANDROID PHONE
   A. video-https://youtu.be/sZVYzEHLcfM
   B. Required apps - "juice SSH" , "VNC viewer" , "Ping"
   C. first find the ip address of rpi and create a SSH session in "juice SSH"
   D. install the following package
      1. sudo apt-get install tightvncserver
   E. write the following command in the command line terminal
      1. tightvncserver
   F. now you will need to create any password to access yor desktops (keep password length of 8)
   G. now type the command
      1. tightvncserver
      2. now we will be given a desktop number (in my case "2")
   H. now minimize the app (Don't close) and open VNC viewer
   I. now create a new connection in VNC viewer
      1. type ip address follwed by desktop number with colon in between them
      2. 192.168.1.102:2
      3. and give any name and click on create
   J. now click on connect if you get security error just press ok
   K. now type the password you created in SSH and press continue

# 5.Using Code for logging and IoT

**Imports to be installed**

- pip install paho-mqtt
- Pip install psutil

**ThingSpeak Details**

# publish
string.alphanum = '_____'

# The ThingSpeak Channel ID.
# Replace <YOUR-CHANNEL-ID> with your channel ID.
channelID = "_____"

# The Write API Key for the channel.
# Replace <YOUR-CHANNEL-WRITEAPIKEY> with your write API key.
writeAPIKey = "___"

# The Hostname of the ThingSpeak MQTT broker.
mqttHost = "mqtt.thingspeak.com"

# You can use any Username.
mqttUsername = "____"

# Your MQTT API Key from Account > My Profile.
mqttAPIKey = "____"
tTransport = "websockets"
tPort = 80

# 6.Using Code for Display

## Imports to be installed

- pip install pygame

## Things to take care of

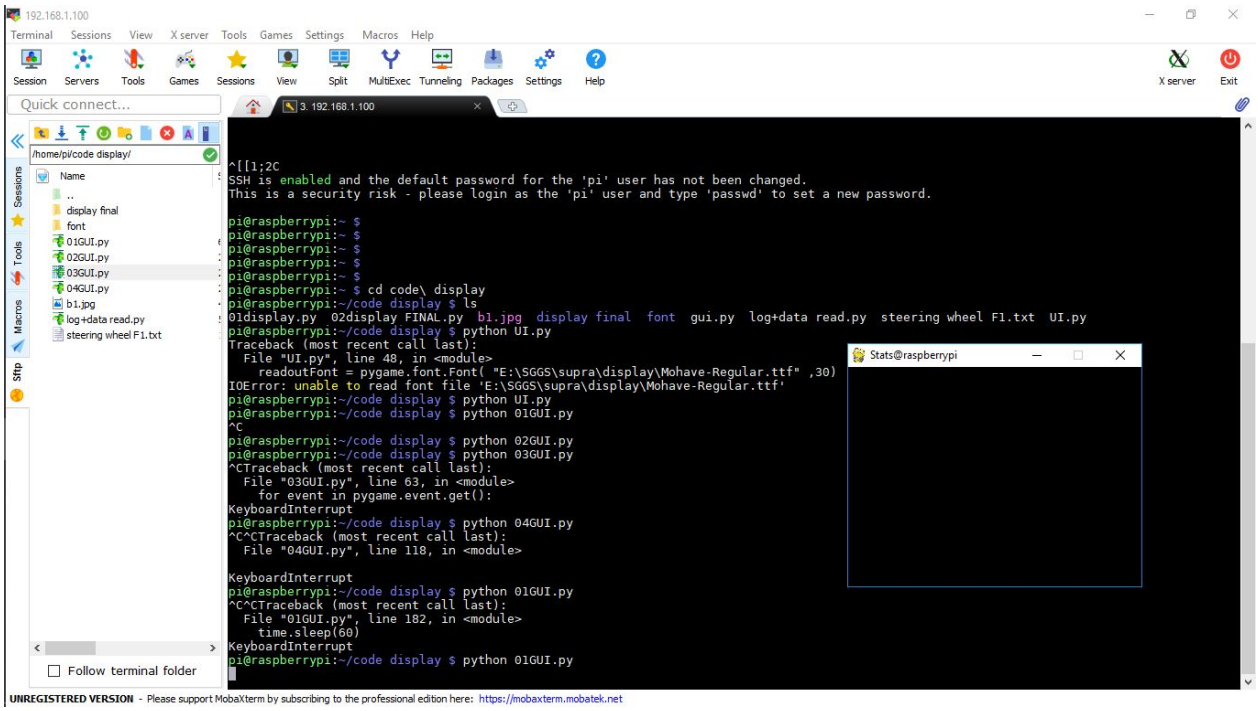
- font path (/home/pi/code display/font/Mohave-Regular.ttf)
- background image path (b1.jpg)

## File Structure

## (GUI)

- 01GUI.py

  code for reference (blank screen)

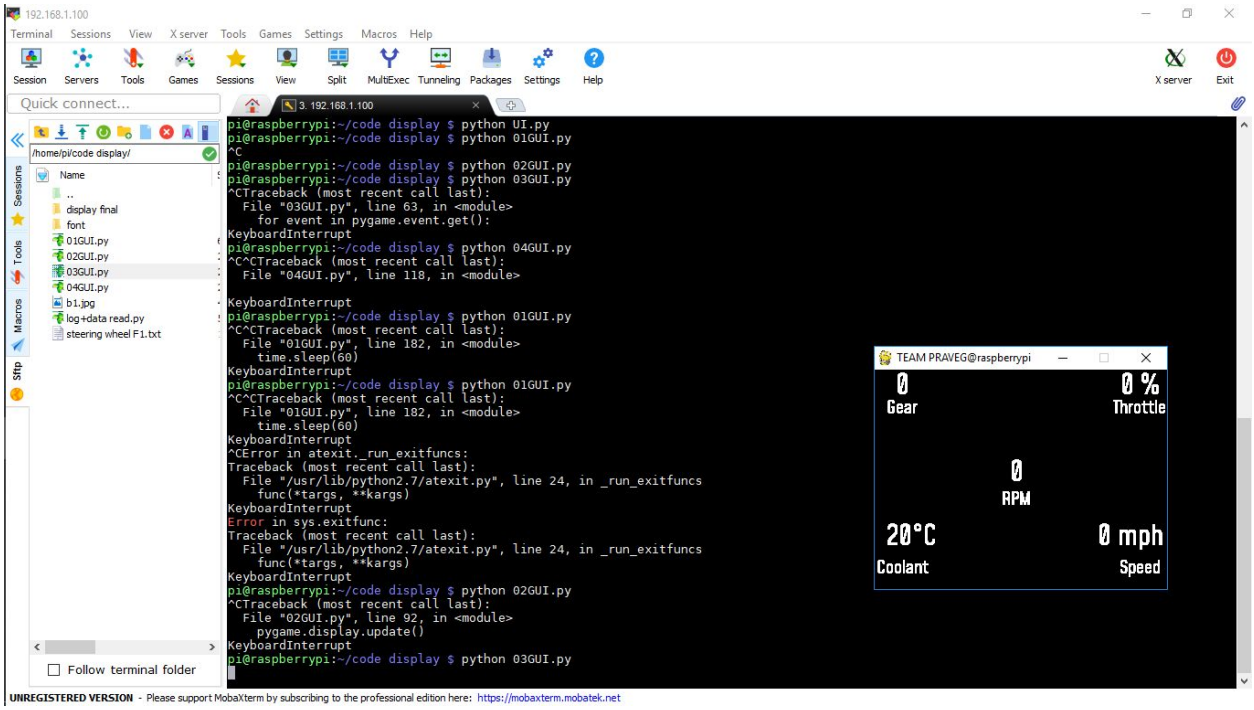



- 02GUI.py

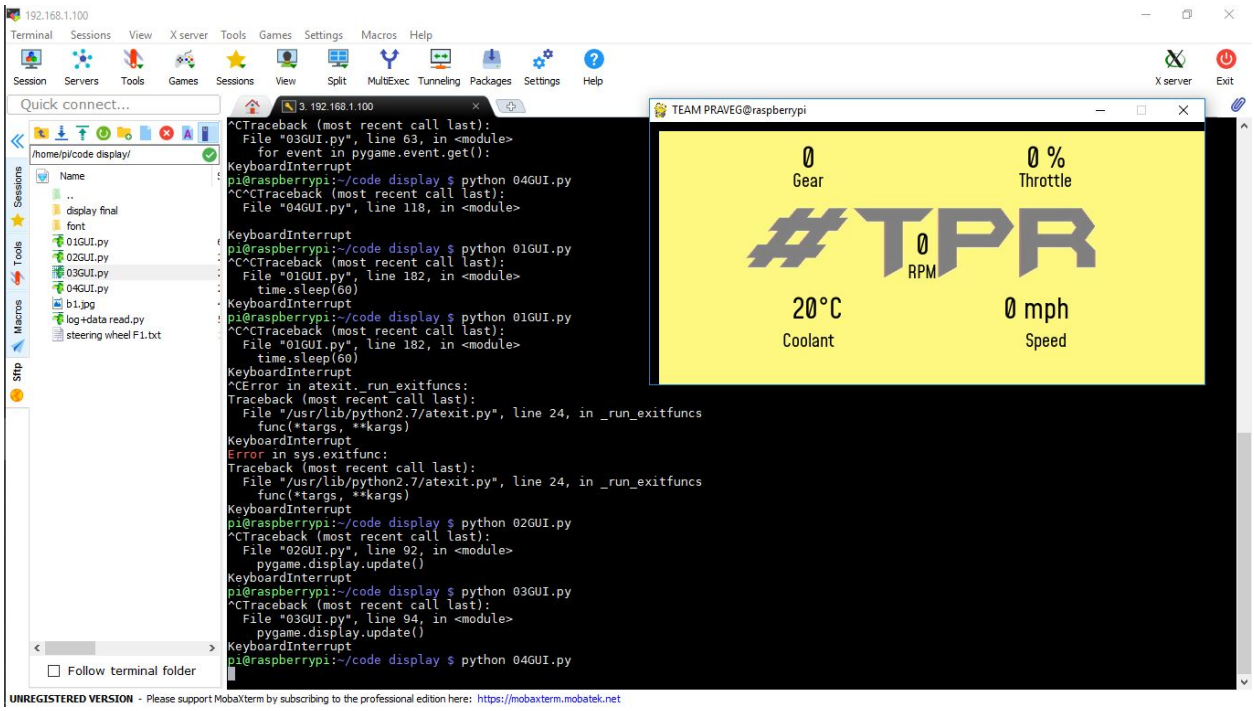
  Hardcoded variables UI

- 03GUI.py

  Hardcoded variables UI (modified)




- 04GUI.py
  Hardcoded variables UI (Background added & Resolution changed to phone supported)



**(Display Final)**

Contains all the code for the display GUI integrated with the functional code of sensors.