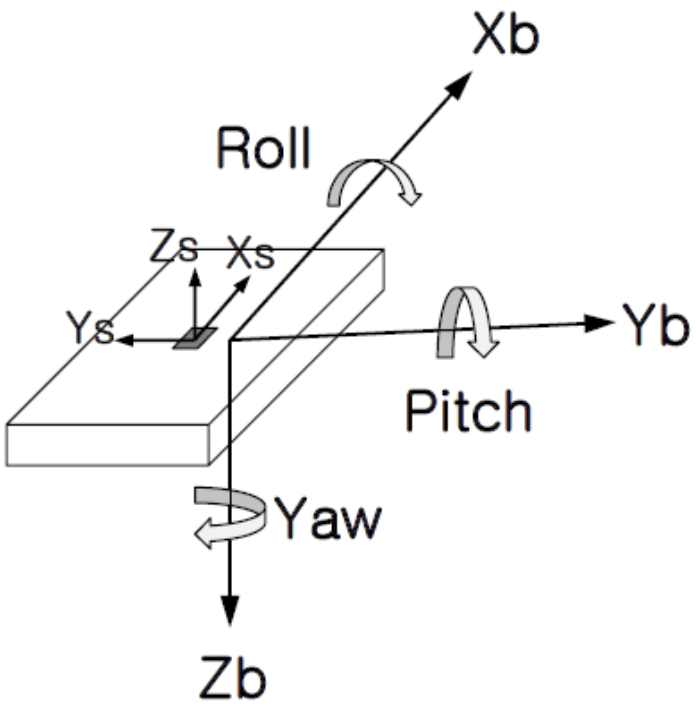
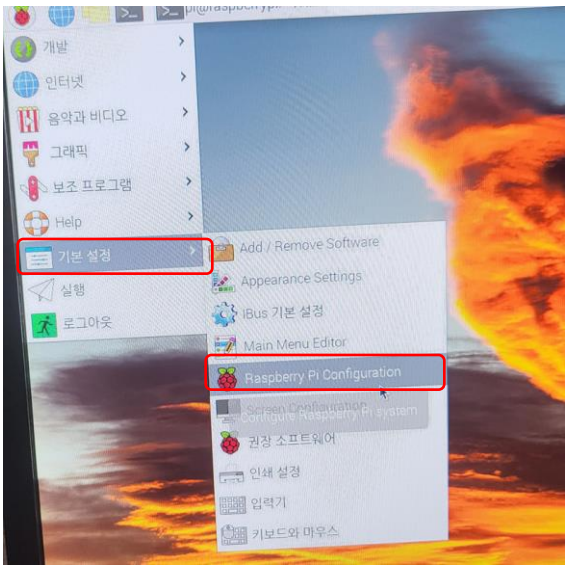
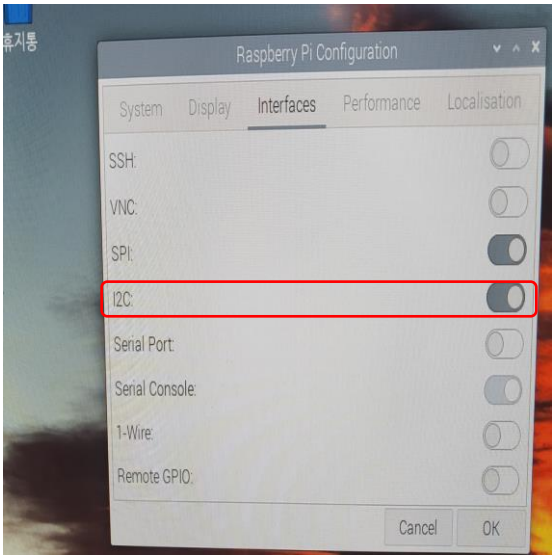
1. 자이로센서 (교재 p. 434, ch9)



*** i2c 디바이스 설정 (교재 p.321, ch6)**

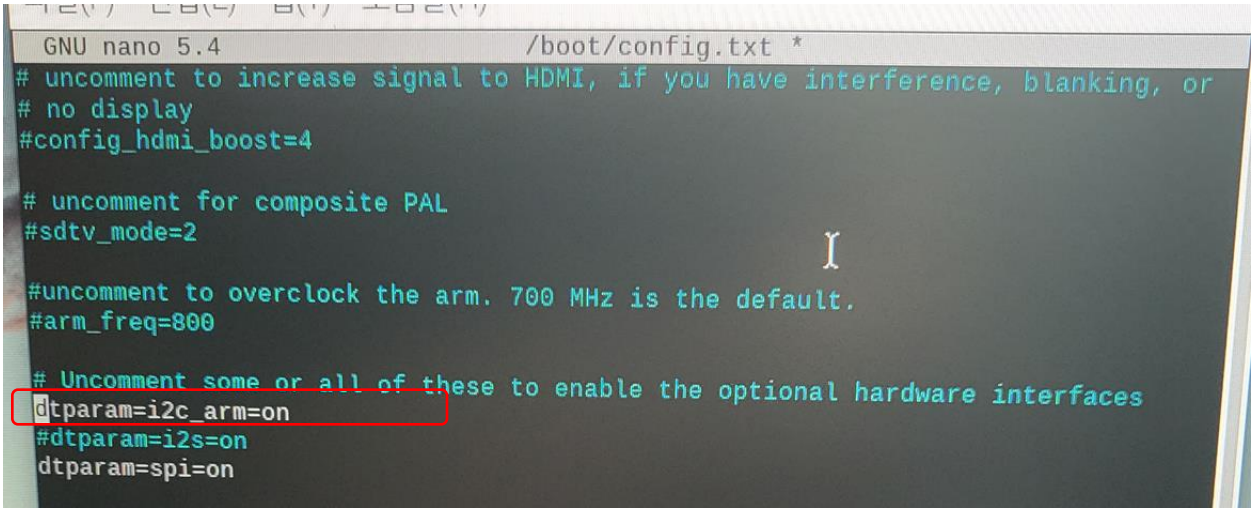
$ sudo raspi-config 또는 다음과 같이 설정



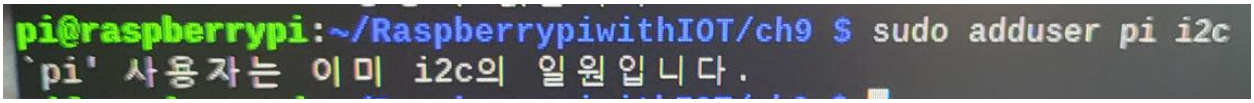


$ sudo nano /boot/config.txt

(dtparam=i2c_arm=on 이렇게 체크되어 있는지 확인)

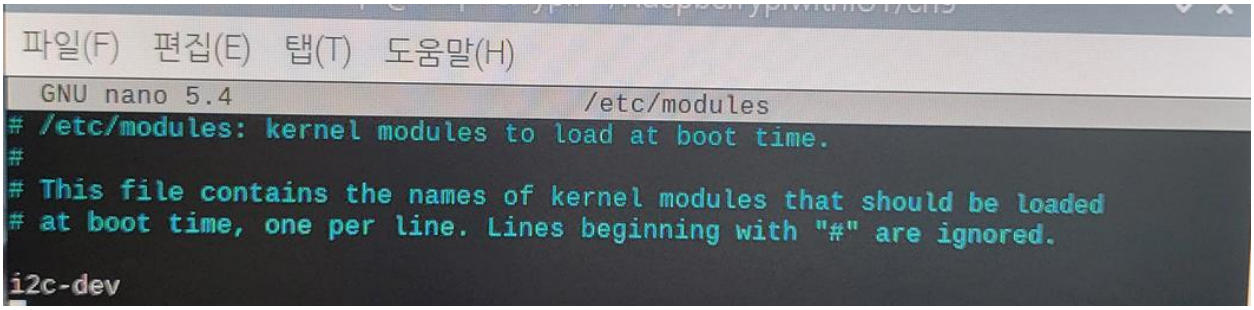


$ sudo adduser pi i2c

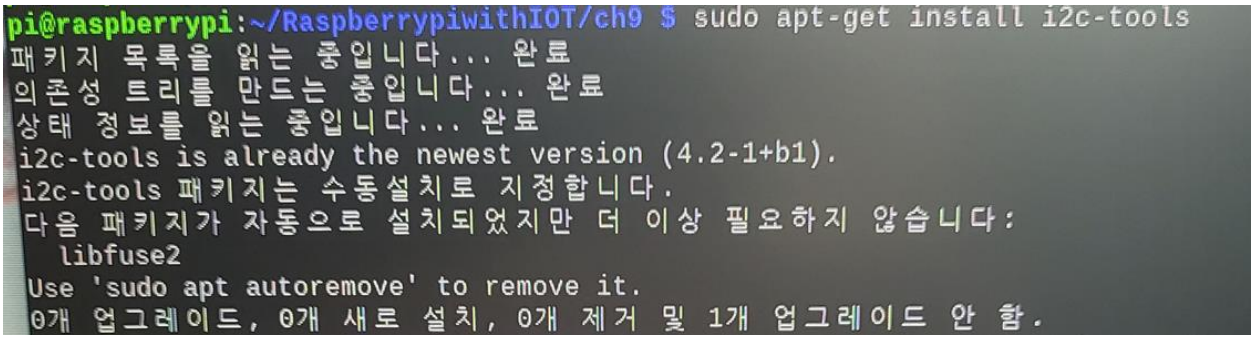


$ sudo nano /etc/modules

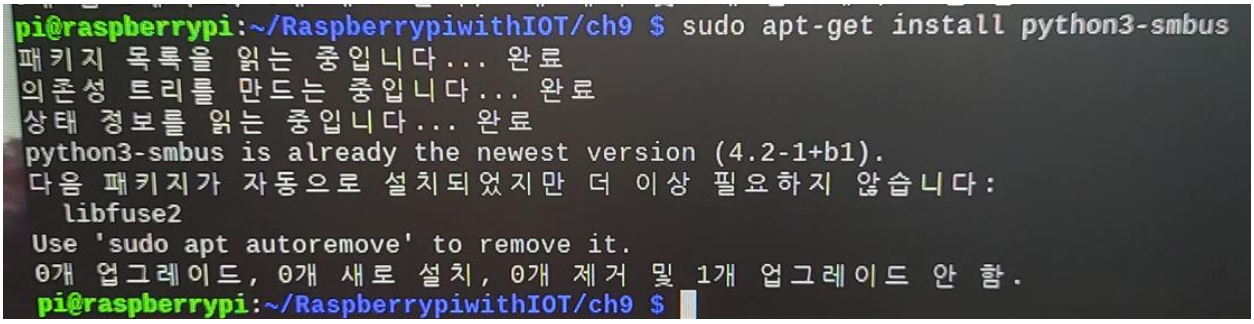
(i2c-dev 추가)



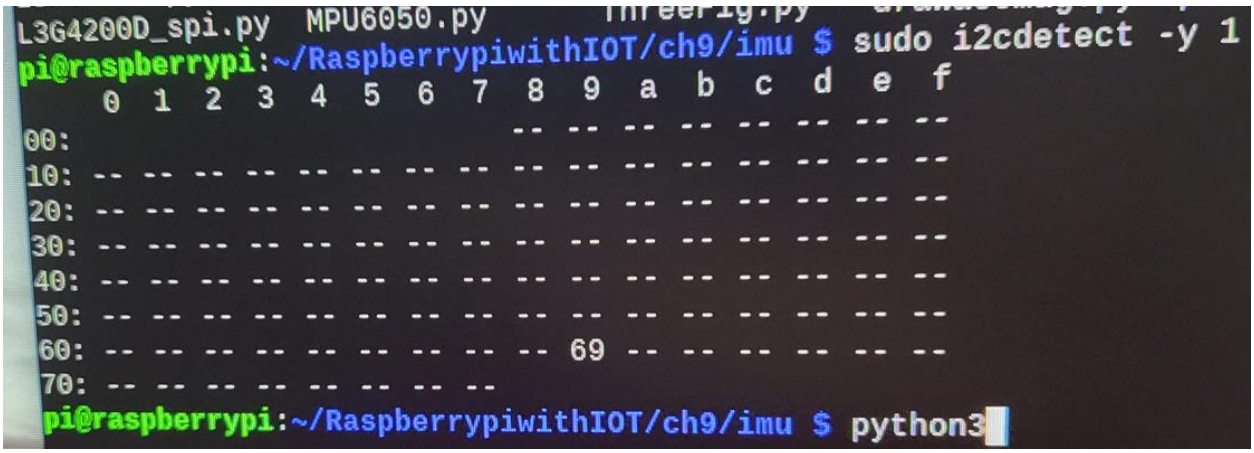
$ sudo apt-get install i2c-tools



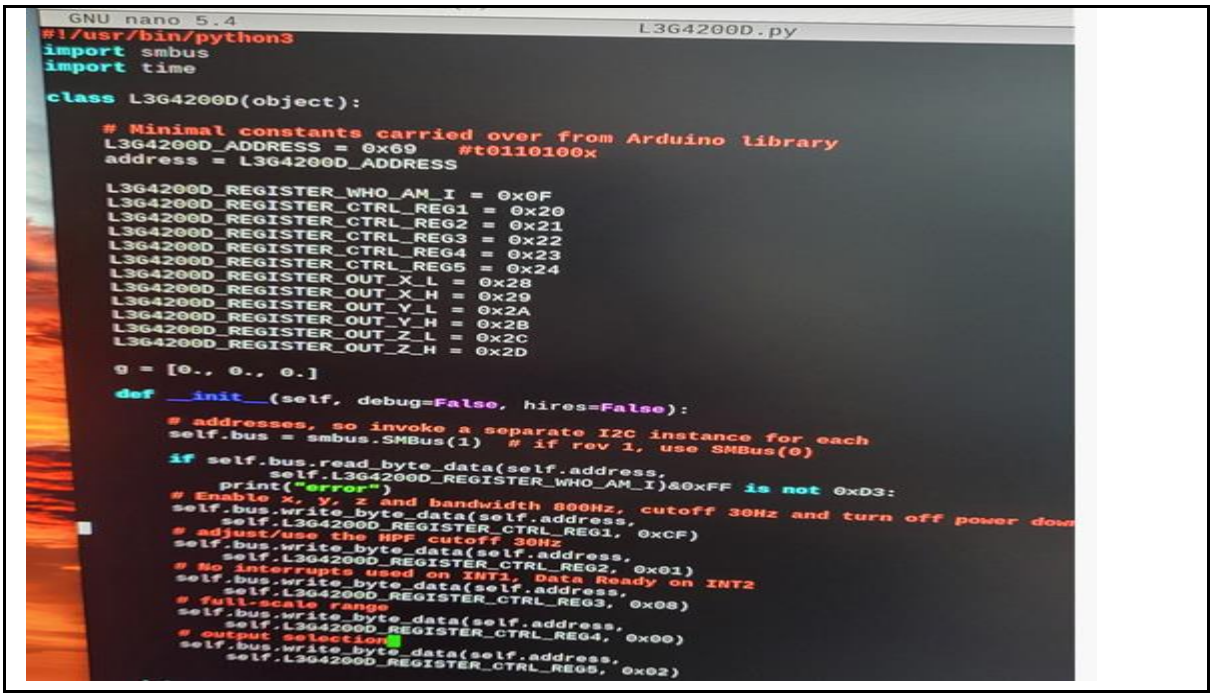
$ sudo apt-get install python3-smbus

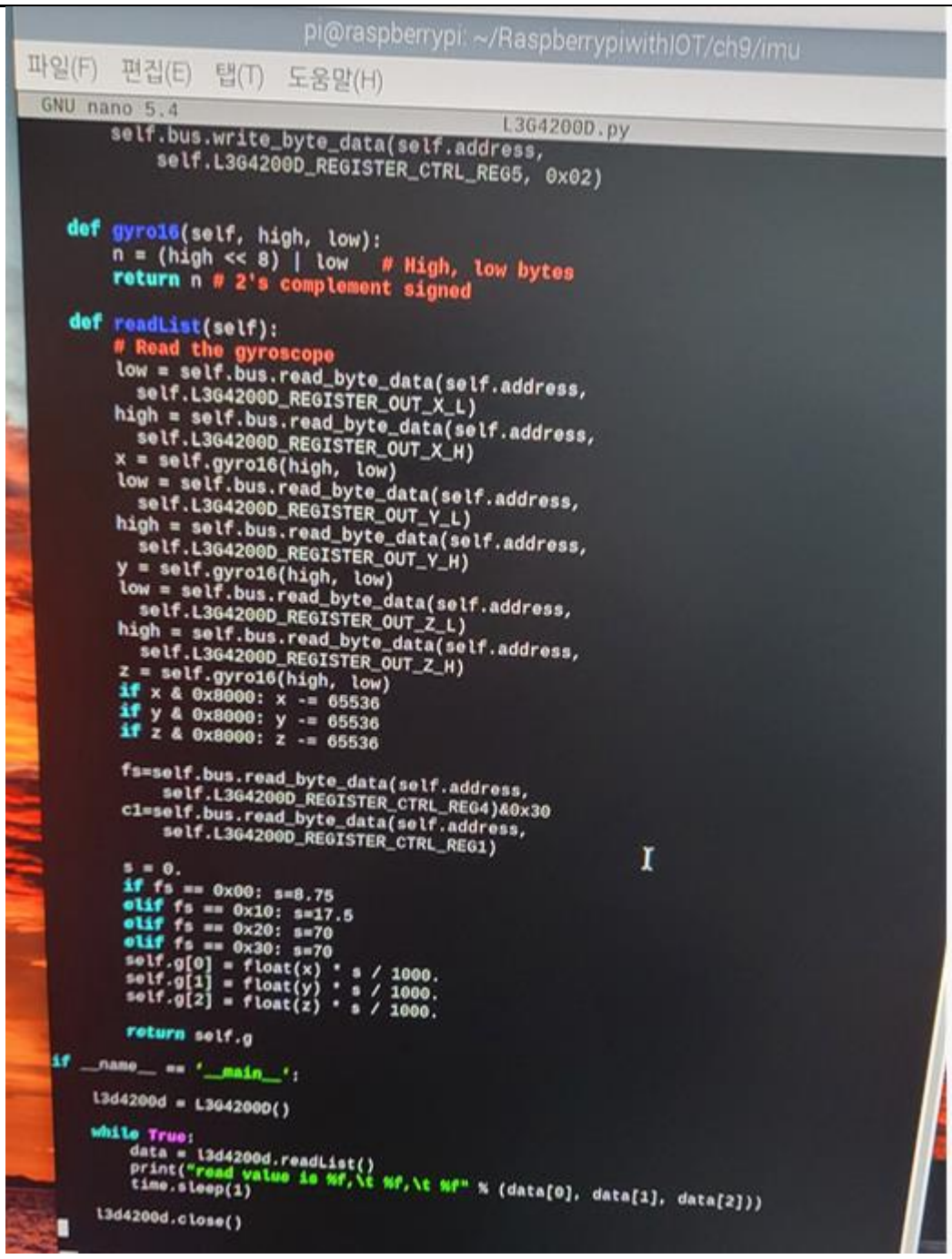


$ sudo i2cdetect –y 1

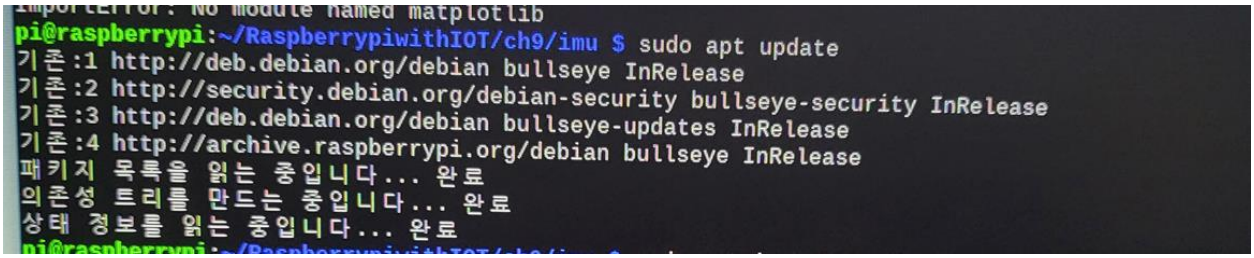


$ python3 L3G4200D.py

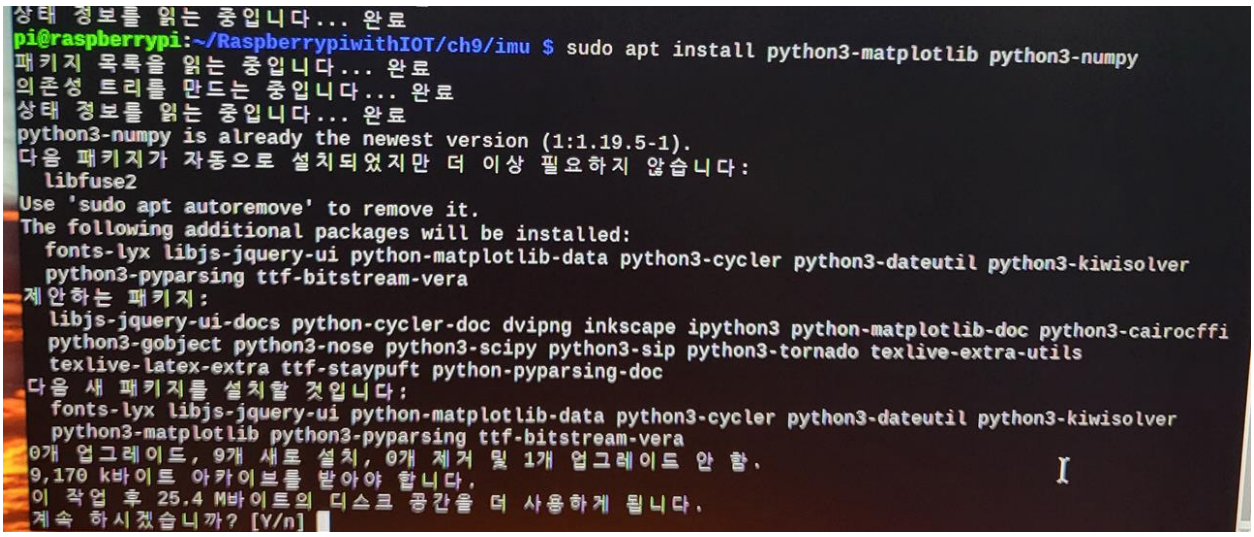



pi@raspberrypi: ~/RaspberrypiwithIOT/ch9/imu
파일(F) 편집(E) 탭(T) 도움말(H)
GNU nano 5.4 L3G4200D.py
self.bus.write_byte_data(self.address,
self.L3G4200D_REGISTER_CTRL_REG5, 0x02)
def gyro16(self, high, low):
n = (high << 8) | low # High, low bytes
return n # 2's complement signed
def readList(self):
# Read the gyroscope
low = self.bus.read_byte_data(self.address,
self.L3G4200D_REGISTER_OUT_X_L)
high = self.bus.read_byte_data(self.address,
self.L3G4200D_REGISTER_OUT_X_H)
x = self.gyro16(high, low)
low = self.bus.read_byte_data(self.address,
self.L3G4200D_REGISTER_OUT_Y_L)
high = self.bus.read_byte_data(self.address,
self.L3G4200D_REGISTER_OUT_Y_H)
y = self.gyro16(high, low)
low = self.bus.read_byte_data(self.address,
self.L3G4200D_REGISTER_OUT_Z_L)
high = self.bus.read_byte_data(self.address,
self.L3G4200D_REGISTER_OUT_Z_H)
z = self.gyro16(high, low)
if x & 0x8000: x -= 65536
if y & 0x8000: y -= 65536
if z & 0x8000: z -= 65536
fs=self.bus.read_byte_data(self.address,
self.L3G4200D_REGISTER_CTRL_REG4)&0x30
c1=self.bus.read_byte_data(self.address,
self.L3G4200D_REGISTER_CTRL_REG1)
s = 0.
if fs == 0x00: s=8.75
elif fs == 0x10: s=17.5
elif fs == 0x20: s=70
elif fs == 0x30: s=70
self.g[0] = float(x) * s / 1000.
self.g[1] = float(y) * s / 1000.
self.g[2] = float(z) * s / 1000.
return self.g
if __name__ == '__main__':
l3d4200d = L3G4200D()
while True:
data = l3d4200d.readList()
print("read value is %f,\t %f,\t %f" % (data[0], data[1], data[2]))
time.sleep(1)
l3d4200d.close()

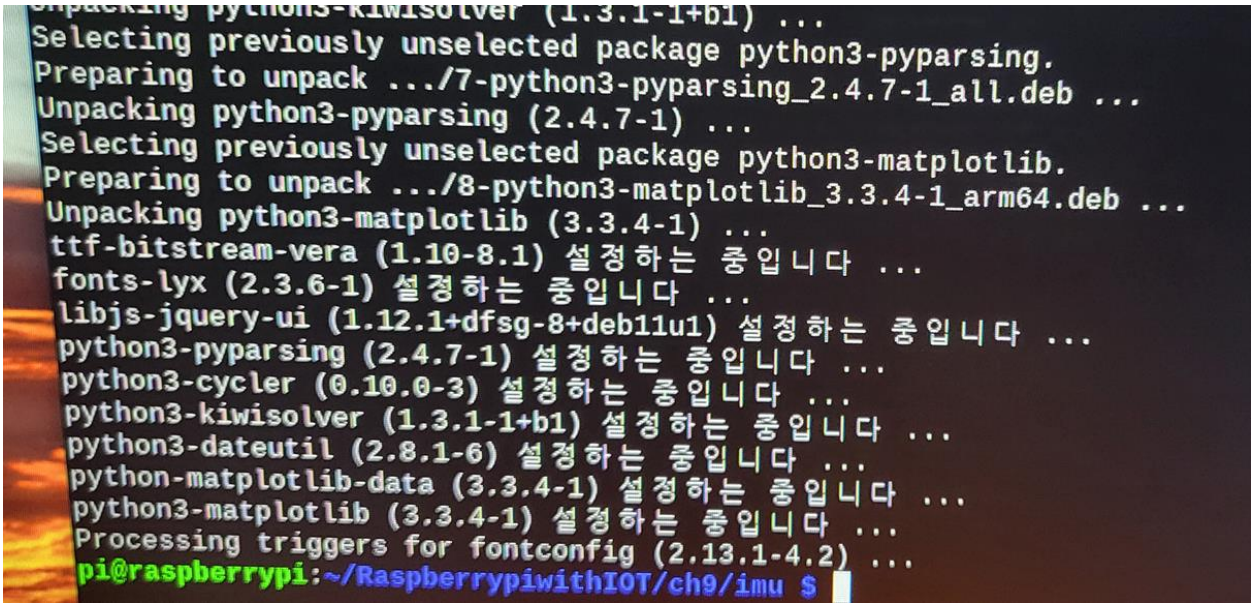
$ sudo apt update



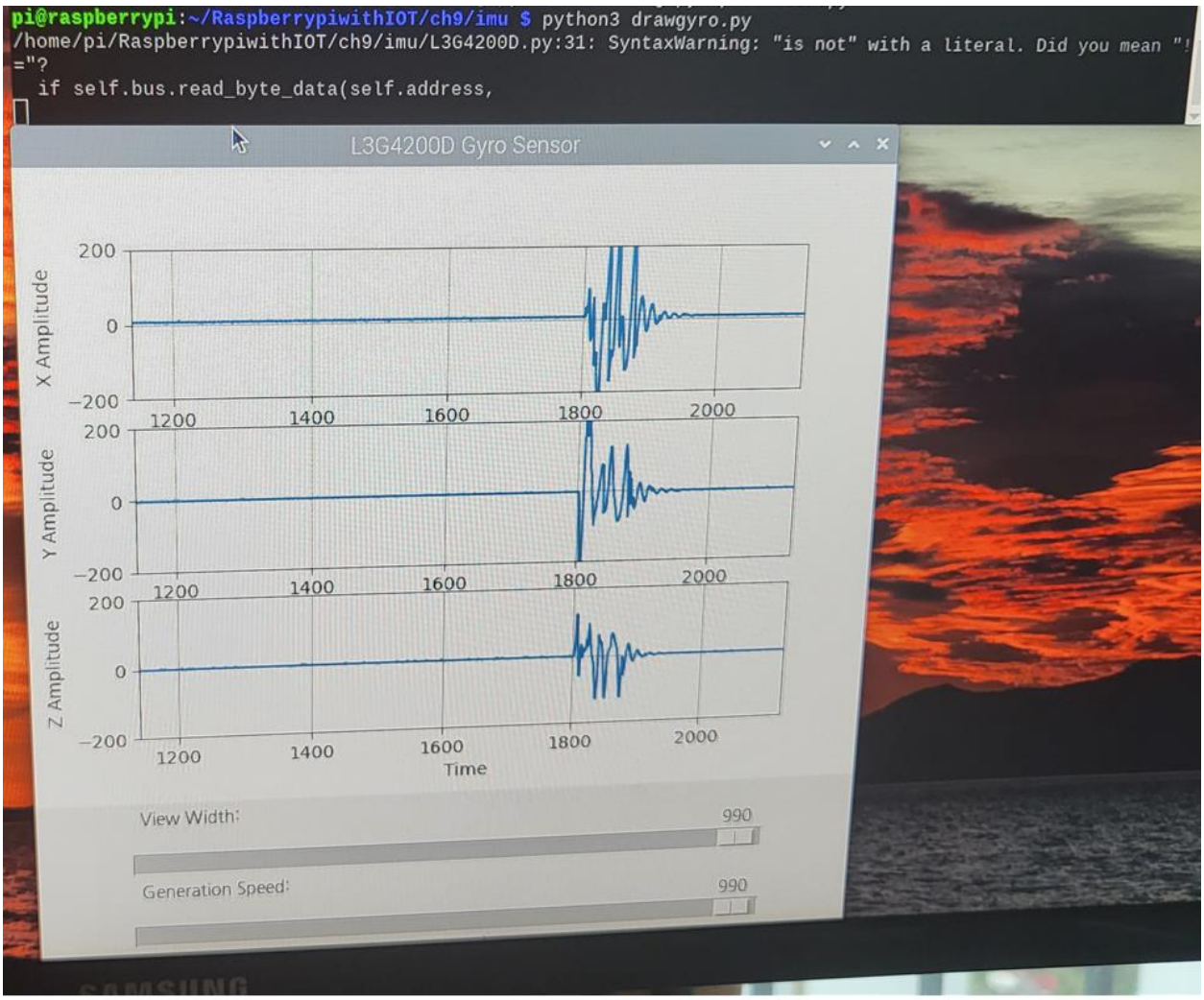
$ sudo apt install python3-matplotlib



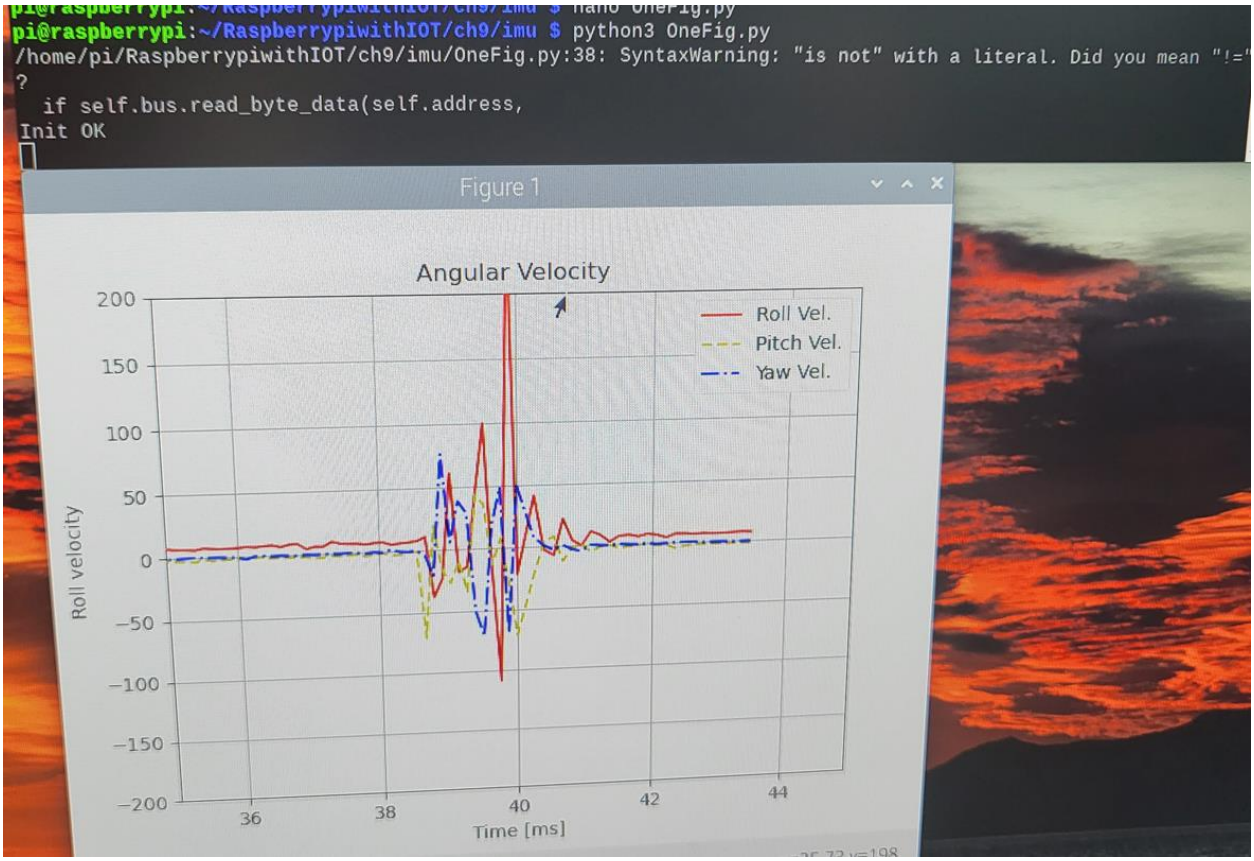
(중략)



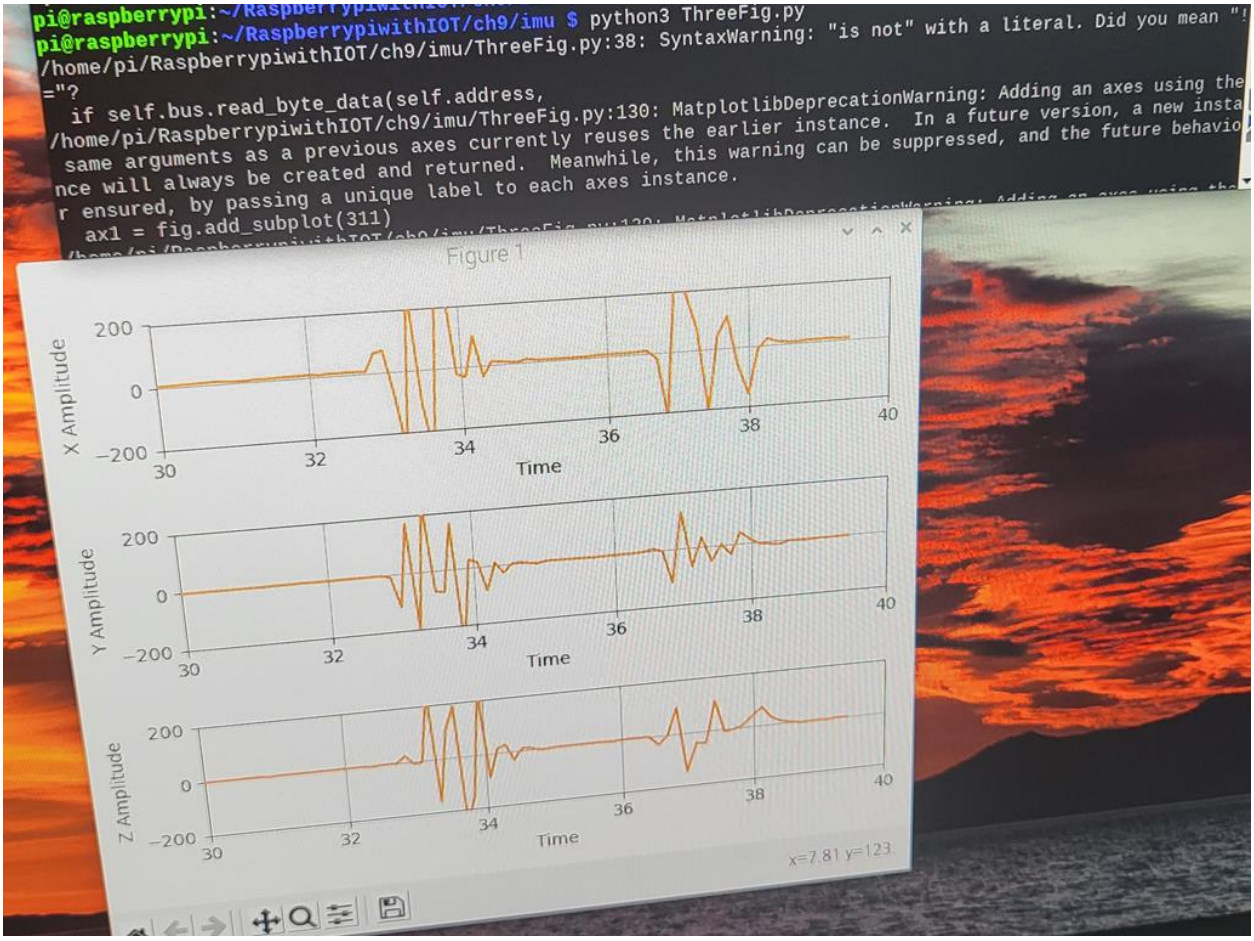
$ python3 drawgyro.py


pi@raspberrypi:~/RaspberrypiwithIOT/ch9/imu $ python3 drawgyro.py
/home/pi/RaspberrypiwithIOT/ch9/imu/L3G4200D.py:31: SyntaxWarning: "is not" with a literal. Did you mean "!
="?
if self.bus.read_byte_data(self.address,
L3G4200D Gyro Sensor
X Amplitude
Y Amplitude
Z Amplitude
200
0
−200
1200
1400
1600
1800
2000
Time
View Width:
990
Generation Speed:
990

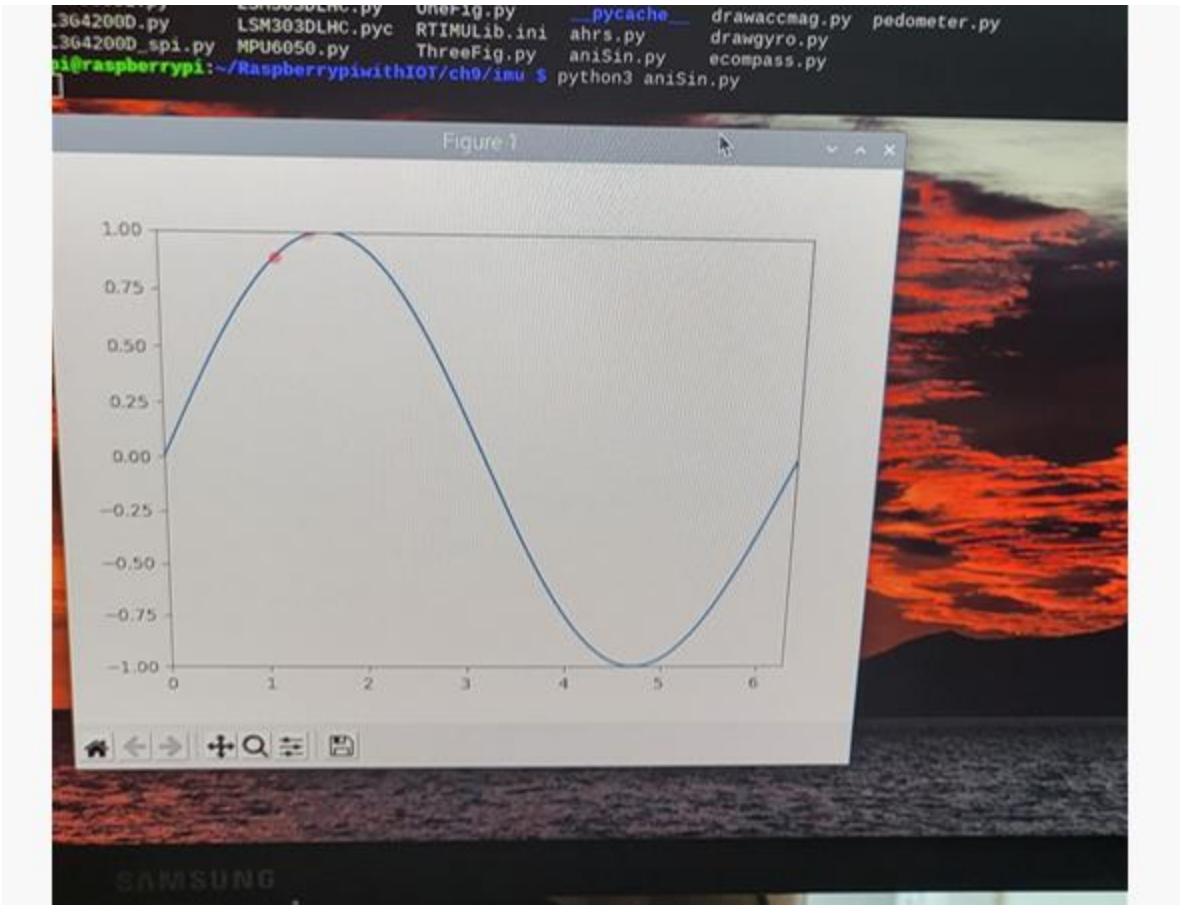
$ python3 OneFig.py



$ python3 ThreeFig.py



$ python3 aniSin.py


L3G4200D.py
L3G4200D_spi.py
LSM303DLHC.py
MPU6050.py
RTIMULib.ini
ThreeFig.py
__pycache__
ahrs.py
aniSin.py
drawaccmag.py
drawgyro.py
ecompass.py
pedometer.py
pi@raspberrypi:~/RaspberrypiwithIOT/ch9/imu $ python3 aniSin.py
Figure 1
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
0
1
2
3
4
5
6
SAMSUNG