▣ RASPBERYYPI 실험

2020.11.03 강경수

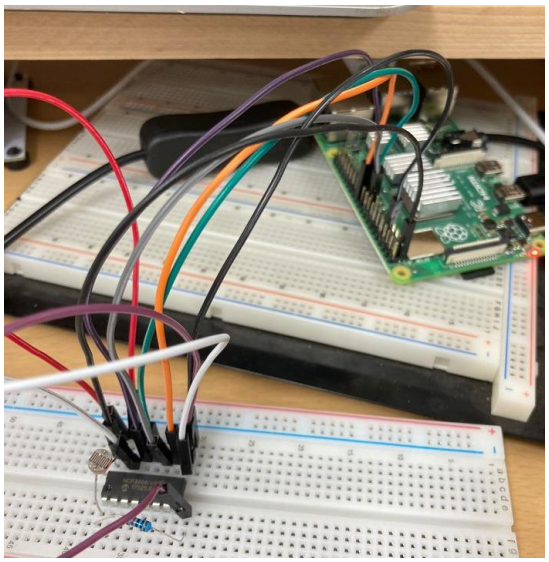
파이썬 코드 | 회로구성

pwm_led.py | spi_adc.py | i2c_oled.py | spi_pot.py

```
import spidev
import time

delay = 0.5
pot_channel = 0

spi = spidev.SpiDev()

spi.open(0, 0)

spi.max_speed_hz = 100000

def readadc(adcnum):
    if adcnum > 7 or adcnum< 0:
        return -1
    r = spi.xfer2([1,8+adcnum<<4,0])
    data = ((r[1]&3)<<8)+r[2]
    return data

while True:
    pot_value = readadc(pot_channel)
    print("---------------")
    print("POT Value : %d" % pot_value)
    time.sleep(delay)
```

Shell

```
POT Value : 921
---------------
POT Value : 912
---------------
POT Value : 911
---------------
POT Value : 923
```

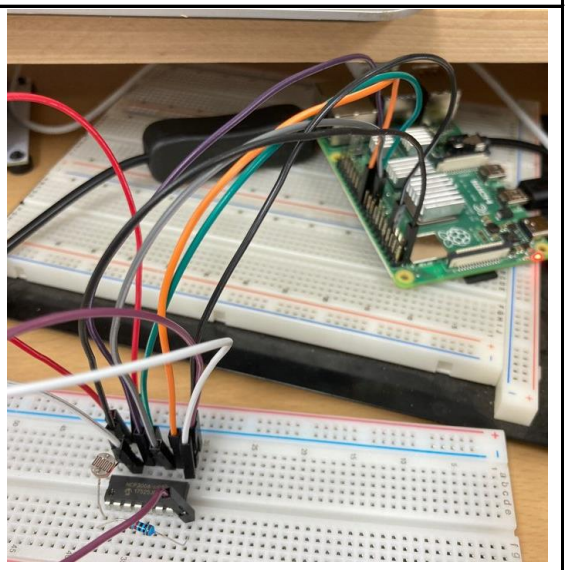


pwm_led.py | spi_adc.py

```
import spidev
import time

delay = 0.5
ldr_channel = 0

spi = spidev.SpiDev()

spi.open(0, 0)

spi.max_speed_hz = 100000

def readadc(adcnum):
    if adcnum > 7 or adcnum< 0:
        return -1
    r = spi.xfer2([1,8+adcnum<<4,0])
    data = ((r[1]&3)<<8)+r[2]
    return data

while True:
    ldr_value = readadc(ldr_channel)
    print("---------------")
    print("LDR Value : %d" % ldr_value)
    time.sleep(delay)
```

Shell

```
LDR Value : 922
---------------
LDR Value : 928
---------------
LDR Value : 916
---------------
LDR Value : 917
```

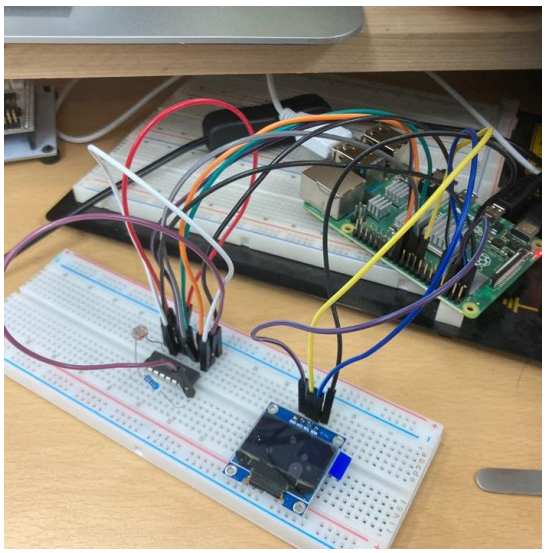


spi_pot.py | i2c_oled.py

```
import time
import Adafruit_SSD1306

from PIL import Image, ImageDraw, ImageFont

import spidev

ldr_channel = 0

spi = spidev.SpiDev()
spi.open(0,0)
spi.max_speed_hz = 100000

disp = Adafruit_SSD1306.SSD1306_128_64(rst=None,i2c_address=0x3C)
disp.begin()

dittsp.clear()
disp.display()

width = disp.width
height = disp.height
image = image.new('1',(width,height))
```

Shell

```
  File "/usr/local/lib/python3.7/dist-packages/Adafruit_SSD1306-1.6.2-py3.7.egg/Adafruit_SSD1306/SSD1306.py", line 85, in __init__
    self._gpio = GPIO.get_platform_gpio()
  File "/usr/local/lib/python3.7/dist-packages/Adafruit_GPIO-1.0.4-py3.7.egg/Adafruit_GPIO/GPIO.py", line 420, in get_platform_gpio
    import Adafruit_BBIO.GPIO
ModuleNotFoundError: No module named 'Adafruit_BBIO'
```

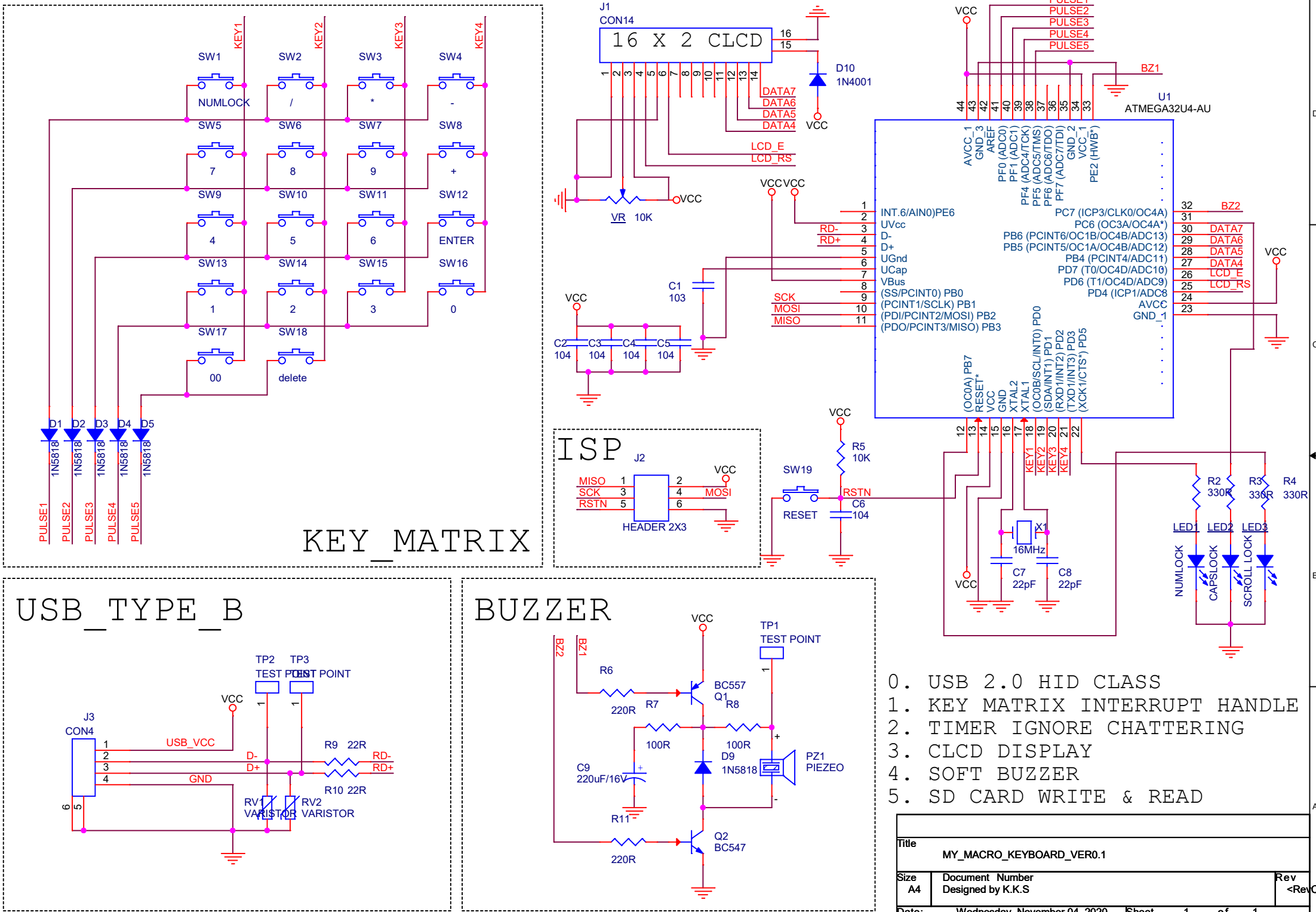


▣ Python Review

2020.11.03 강경수

```python
import time
from multiprocessing import Pool #multiprocessing 을 하기 위한 인력풀을 만든다.

def f(x):
    return x * x

pool = Pool(processes = 4) # CPU 4개 쓰는것이다.

res = pool.apply_async(f, (10, )) #async 비동기 프로세스 로직.
print(res.get(timeout = 1)) #1초안에 통과하면 pass 그러지못하면 pass 실패.

print(pool.map(f, range(10))) # 0 부터 81 까지 list 형태로 출력

it = pool.imap(f, range(10)) #이터레이션 요소를 하나씩 땡겨 올 수 있다.
print(it.next()) #다음거를 출력해주세요
print(it.next()) #그 다음거를 출력해주세요
print(it.next(timeout = 2)) #2초내에 처리해주지 못하면 TIME OUT

res = pool.apply_async(time.sleep, (10, )) # 10초 대기 하라 , 통과했으므로 NONE 출력 걸어놓고 밑에거 대기 한다 그래서 비동기 처리
print(res.get(timeout=60)) # TIME OUT은 60초 이다 그래서 통과 했을것이다.
print("pass")
res = pool.apply_async(time.sleep, (10, )) #10초 대기하라
print(res.get(timeout = 3 ))
```

```python
import time
import threading

class DummyThread(threading.Thread):
    def run(self):
        now = time.ctime()
        print("[time:%s][tid:%d] Hello Thread!\n" %(now, self.ident)) #cpu개수에 따라서 process id가 다를 수 있다.

for i in range(3):
        t = DummyThread()
        t.start()
```


KEY_MATRIX
SW1
SW2
SW3
SW4
KEY1
KEY2
KEY3
KEY4
NUMLOCK
/
*
-
7
8
9
+
4
5
6
ENTER
1
2
3
0
00
delete
D1 D2 D3 D4 D5
1N5818
PULSE1
PULSE2
PULSE3
PULSE4
PULSE5
J1
CON14
16 X 2 CLCD
DATA7
DATA6
DATA5
DATA4
LCD_E
LCD_RS
VR 10K
D10
1N4001
U1
ATMEGA32U4-AU
BZ1
BZ2
C1 103
C2 104
C3 104
C4 104
C5 104
SCK
MOSI
MISO
ISP
J2
HEADER 2X3
SW19
RESET
R5 10K
C6 104
X1
16MHz
C7 22pF
C8 22pF
R2 330R
R3 330R
R4 330R
LED1
LED2
LED3
NUMLOCK
CAPSLOCK
SCROLL LOCK
USB_TYPE_B
J3
CON4
USB_VCC
D-
D+
GND
R9 22R
R10 22R
RD-
RD+
RV1 VARISTOR
RV2 VARISTOR
TP2 TEST POINT
TP3 TEST POINT
BUZZER
TP1 TEST POINT
R6
R7
R8
220R
100R
BC557
Q1
Q2
BC547
C9 220uF/16V
R11
D9 1N5818
PZ1 PIEZEO
0. USB 2.0 HID CLASS
1. KEY MATRIX INTERRUPT HANDLE
2. TIMER IGNORE CHATTERING
3. CLCD DISPLAY
4. SOFT BUZZER
5. SD CARD WRITE & READ
Title
MY_MACRO_KEYBOARD_VER0.1
Size
A4
Document Number
Designed by K.K.S
Rev
Date:
Wednesday, November 04, 2020
Sheet
1
of
1

MACRO KEYBOARD PARTLIST

※ LEONARDO BOARD에 회로 검증 후 부품 변경 될 수 있음 **작성자 : 강경수**

※ SD카드 추가 필요 **작성일 : 201102**

ITEM	PARTNAME	DESCRITPION	QTY	LOCATION	VENDOR
1	CERAMIC CAPACITOR	103/50V	1	C1	ANY
2	CERAMIC CAPACITOR	104/50V	5	C2,C3,C4,C5,C6	ANY
3	CERAMIC CAPACITOR	22pF/50V	2	C7,C8	ANY
4	ELEC. CAPACITOR	220uF/16V	1	C9	ANY
5	SWITCHING DIODE	1N5818	6	D1,D2,D3,D4,D5,D9	ANY
6	SWITCHING DIODE	1N4001	1	D10	ANY
7	14X1 HEADER	P 2.54mm	1	J1	ANY
8	2X3 HEADER	P 2.54mm	1	J2	ANY
9	670688000	USB - B CON	1	J3	MOLEX
10	SZH - SW038	SWITCH	18	SW1~SW18	CHERRY
11	NW3-A06-B3	TACK SWITCH	1	SW19	NW3
12	3BCLSW02	WHITE 3PI	3	LED1,LED2,LED3	DAKWANG
13	FQ - 030	PIEZEO BUZZER	1	PZ1	SMG
14	BC557	NPN TR	1	Q1	ONSEMI
15	BC547	PNP TR	1	Q2	ONSEMI
16	CG0603MLC-05E	VARISTOR	2	RV1,RV2	BOURNS
17	CHIP RESISTOR	330R,J,1608,1/4W	3	R2,R3,R4	TA-I
18	CHIP RESISTOR	10K,J,1608,1/4W	1	R5	TA-I
19	CHIP RESISTOR	22R,J,1608,1/4W	2	R7,R8	TA-I
20	CHIP RESISTOR	220R,J,1608,1/4W	2	R6,R11	TA-I
21	CHIP RESISTOR	100R,J,1608,1/4W	2	R7,R8	TA-I
22	CHIP RESISTOR	22R,J,1608,1/4W	2	R9,R10	TA-I
23	CRYSTAL	16Mhz, X-TAL	1	X1	caltron
24	MCU	ATMEGA32U4-AU	1	U1	Microchip
25	16X2 CLCD (LEFT UP)	LC1621-SMLYH6	1	LCD1	-