

2022년 IoT기반 스마트 솔루션 개발자 양성과정



Programming : Python

10-PySound

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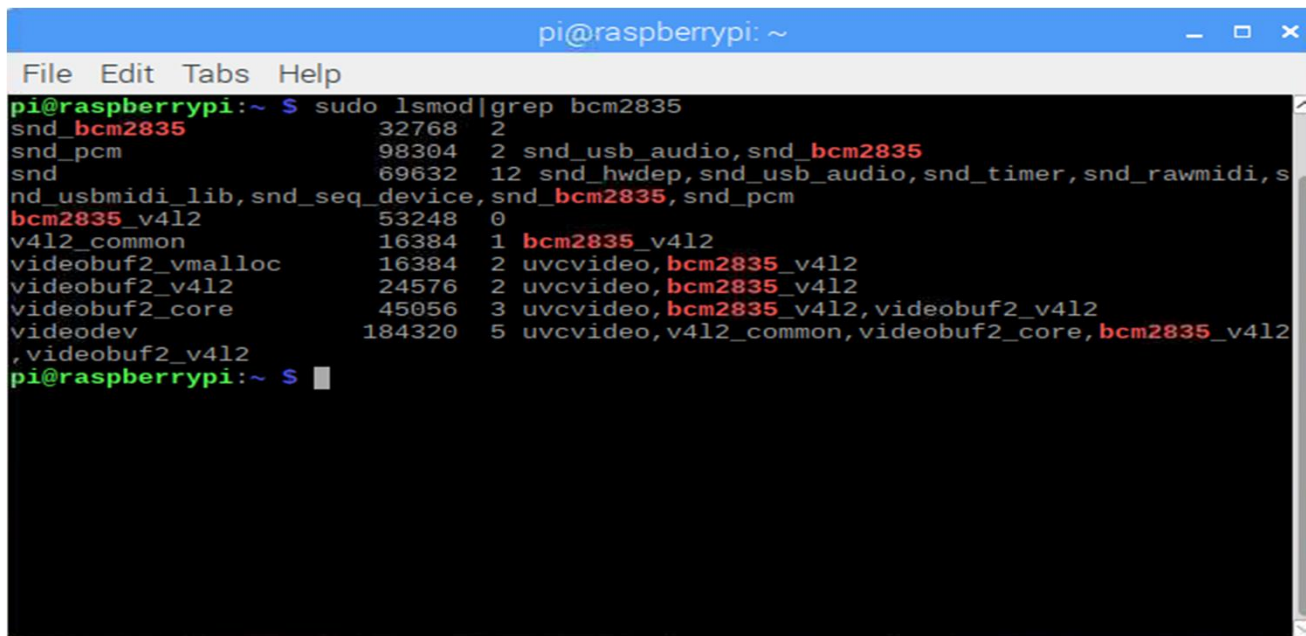
<https://cafe.naver.com/yoons2022>



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Sound Driver

- \$ sudo lsmod | grep bcm2835



```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~$ sudo lsmod | grep bcm2835  
snd_bcm2835          32768  2  
snd_pcm             98304  2 snd_usb_audio,snd_bcm2835  
snd                 69632  12 snd_hwdep,snd_usb_audio,snd_timer,snd_rawmidi,snd_usbmidi_lib,snd_seq_device,snd_bcm2835,snd_pcm  
bcm2835_v4l2        53248  0  
v4l2_common         16384  1 bcm2835_v4l2  
videobuf2_vmalloc   16384  2 uvcvideo,bcm2835_v4l2  
videobuf2_v4l2      24576  2 uvcvideo,bcm2835_v4l2  
videobuf2_core      45056  3 uvcvideo,bcm2835_v4l2,videobuf2_v4l2  
videodev            184320  5 uvcvideo,v4l2_common,videobuf2_core,bcm2835_v4l2,videobuf2_v4l2  
pi@raspberrypi:~$
```

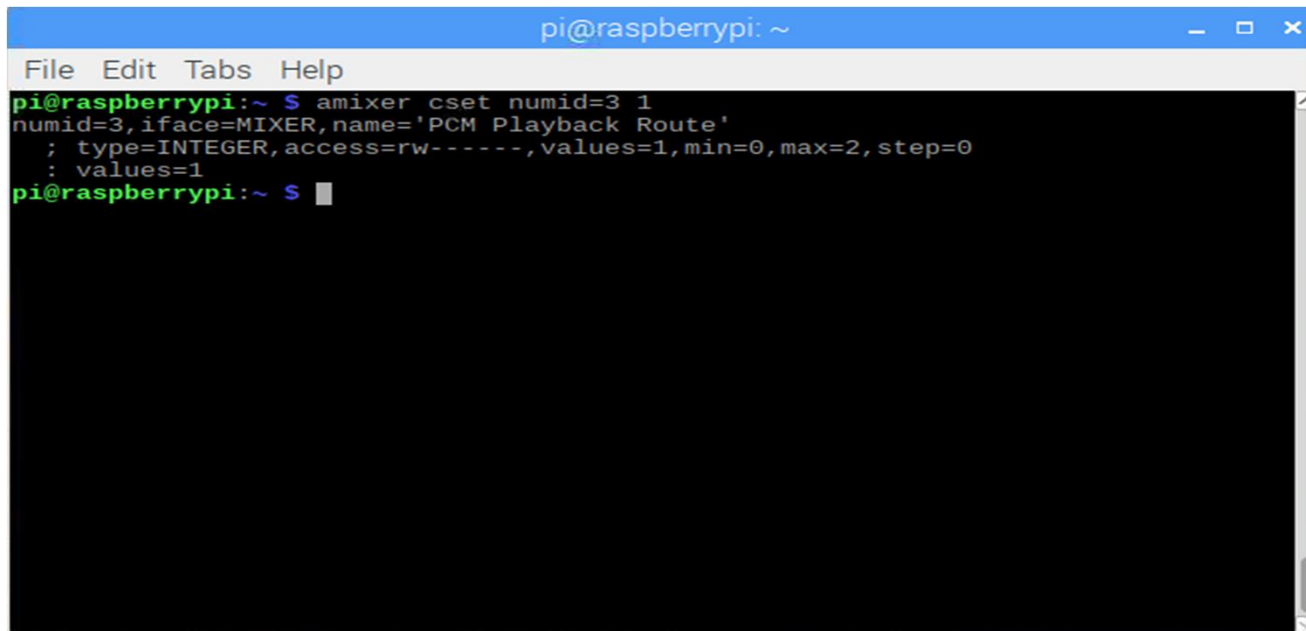
미설치시

\$ sudo apt-get install alsa-utils



Audio Out Port Set

- \$ amixer cset numid=3 n
 - n =0 auto, =1 Analog, =2 HDMI

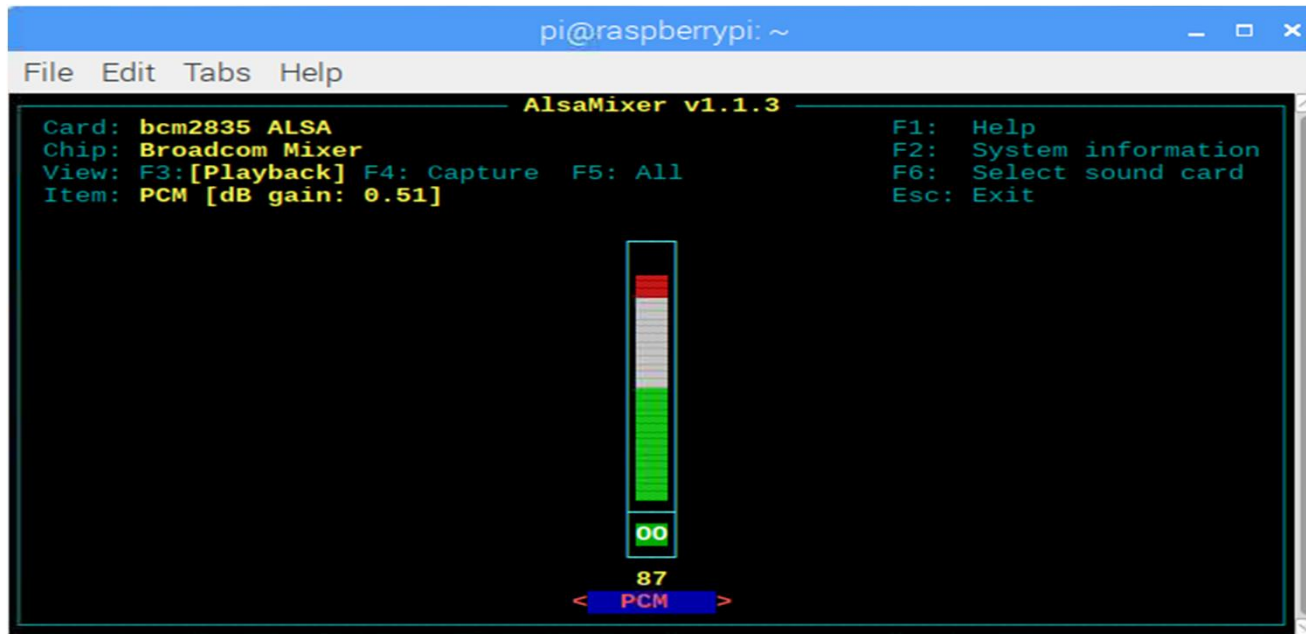


```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~ $ amixer cset numid=3 1  
numid=3,iface=MIXER,name='PCM Playback Route'  
; type=INTEGER,access=rw-----,values=1,min=0,max=2,step=0  
: values=1  
pi@raspberrypi:~ $
```

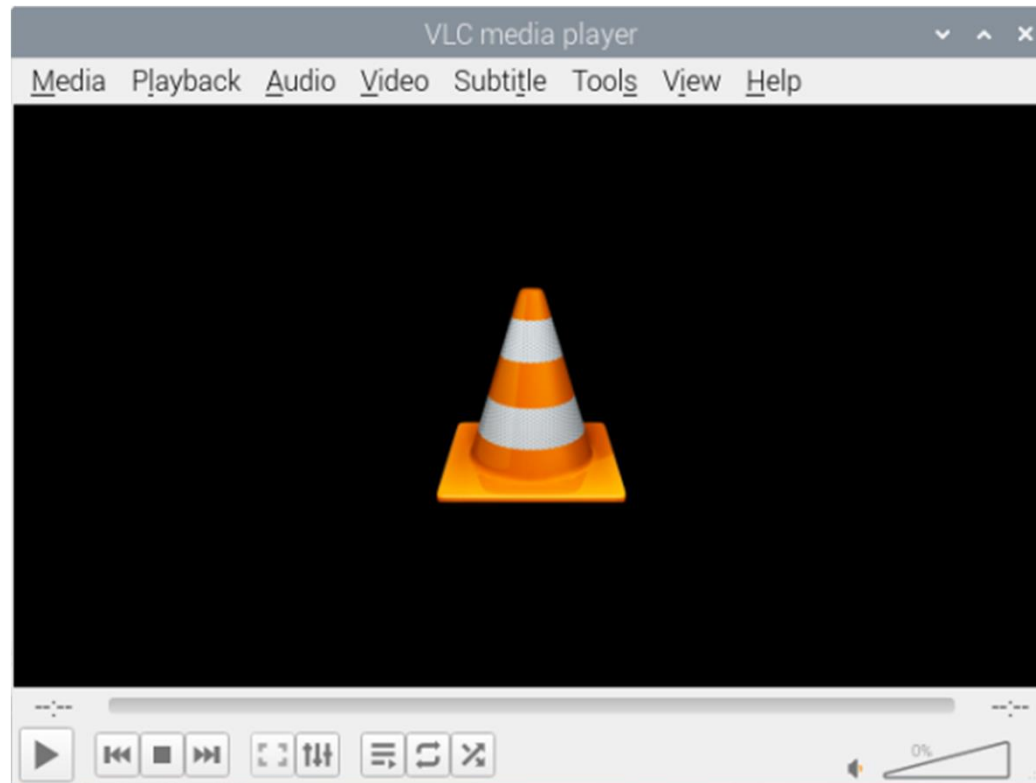


AlsaMixer

- \$ alsamixer



VLC media player



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omxplayer

- OpenMAX (omx) 하드웨어 가속 인터페이스(API)를 사용
- 오디오/비디오 파일 형식을 재생
- `omxplayer <media filename>`

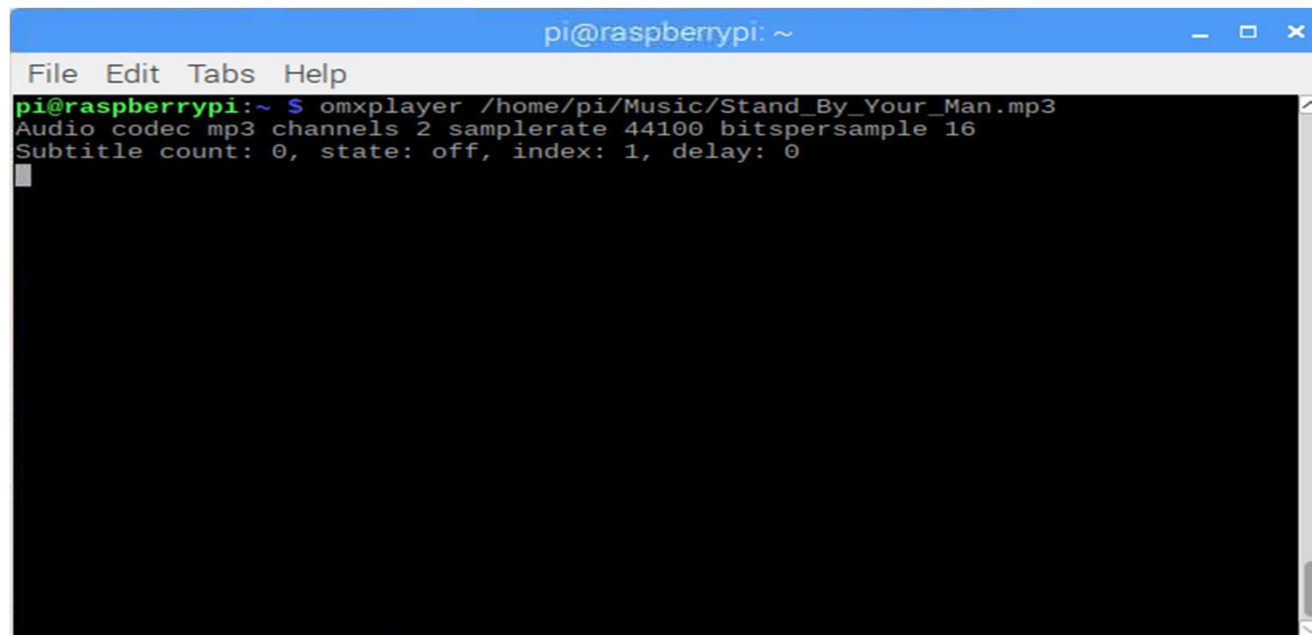
```
-h --help 이 도움말을 출력
-o --adev device 오디오 출력 장치: e.g. hdmi/local/both/alsa[:device]
--win x1,y1,x2,y2 비디오 창 위치 설정
--fps n Set fps of video where timestamps are not present
--alpha 비디오 투명도 설정(0..255)

-k --keys 키 바인딩을 출력
- 볼륨 작게
+ / = 볼륨 크게
p / space 정지/복귀
q omxplayer 종료
```



omxplayer

- `$ omxplayer /home/pi/Music/Stand_By_Your_Man.mp3`

A terminal window titled 'pi@raspberrypi: ~' with a menu bar containing 'File', 'Edit', 'Tabs', and 'Help'. The terminal shows the command 'omxplayer /home/pi/Music/Stand_By_Your_Man.mp3' being executed. Below the command, the output displays audio metadata: 'Audio codec mp3 channels 2 samplerate 44100 bitspersample 16' and 'Subtitle count: 0, state: off, index: 1, delay: 0'. The rest of the terminal area is black.

```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~ $ omxplayer /home/pi/Music/Stand_By_Your_Man.mp3  
Audio codec mp3 channels 2 samplerate 44100 bitspersample 16  
Subtitle count: 0, state: off, index: 1, delay: 0
```



subprocess

- Child process를 생성/실행
- subprocess.call()
 - 단순 호출
- subprocess.Popen()
 - Subprocess의 입출력
 - 문자열 출력에 대한 변환
 - 컨텍스트 매니저
 - Methode
 - poll () : child process가 종료되었는지 확인
 - wait () : child process가 종료될 때까지 대기
 - communicate () : child process와 입출력
 - terminate () : child process에 종료 signal을 전송
 - kill () : child process 강제 종료
 - stdin () : child process read/write (stream 객체)
 - stdout () : child process read
 - stderr () : child process read



Ex1 : Play_MP3.py

```
Play_MP3.py x
1  import subprocess
2
3  mediafile="/home/pi/Music/Stand_By_Your_Man.mp3"
4
5  try:
6      print ('Play',mediafile)
7      proc=subprocess.Popen(['omxplayer','-o','local',mediafile],\
8                             shell=False, stdin=subprocess.PIPE,\
9                             stdout=subprocess.PIPE,stderr=subprocess.PIPE)
10
11     while proc.poll() is None:
12         pass
13
14     print ('End')
15
16 except KeyboardInterrupt:
17     proc.stdin.write('q'.encode())
18     proc.stdin.flush()
19     print ('Quit')
```



Ex1 : Run

```
Shell
Python 3.5.3 (/usr/bin/python3)
>>> %Run Play_MP3.py
    Play /home/pi/Music/Stand_By_Your_Man.mp3
    Quit
>>> %Run Play_MP3.py
    Play /home/pi/Music/Stand_By_Your_Man.mp3
    End
>>>
```



Ex2 : pygame music

```
pygame_sound.py x
1  import pygame
2
3  mp3File='/home/pi/Music/Johnny_B_Goode.mp3'
4
5  pygame.mixer.init()
6  pygame.mixer.music.load(mp3File)
7
8  print ('Play')
9  pygame.mixer.music.play()
10 while pygame.mixer.music.get_busy() == True:
11     continue
12 print ('End Play')
```



Ex2 : Run

```
Shell
>>> %Run pygame_sound.py
      Play
      End Play
>>>
```

