EMBEDDED

SCHOOL

Raspberry-HW3

임베디드스쿨1기

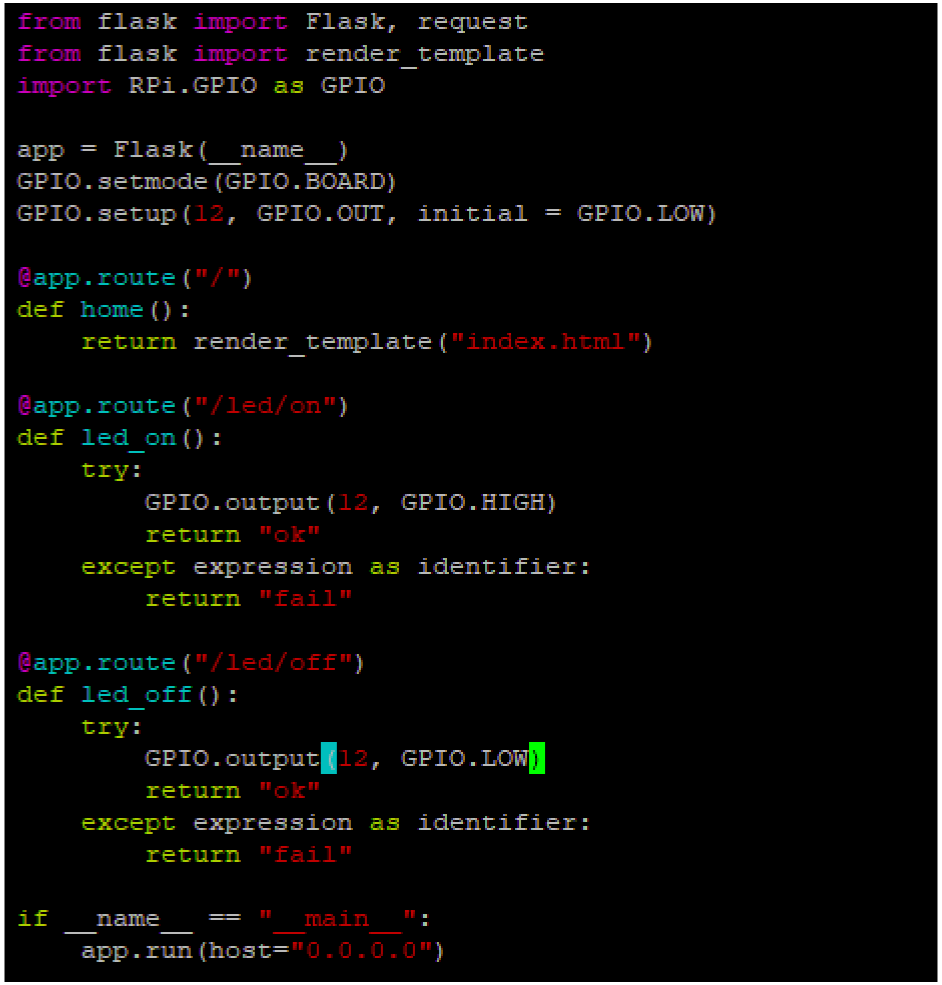
Lv1과정

2020. 11 17

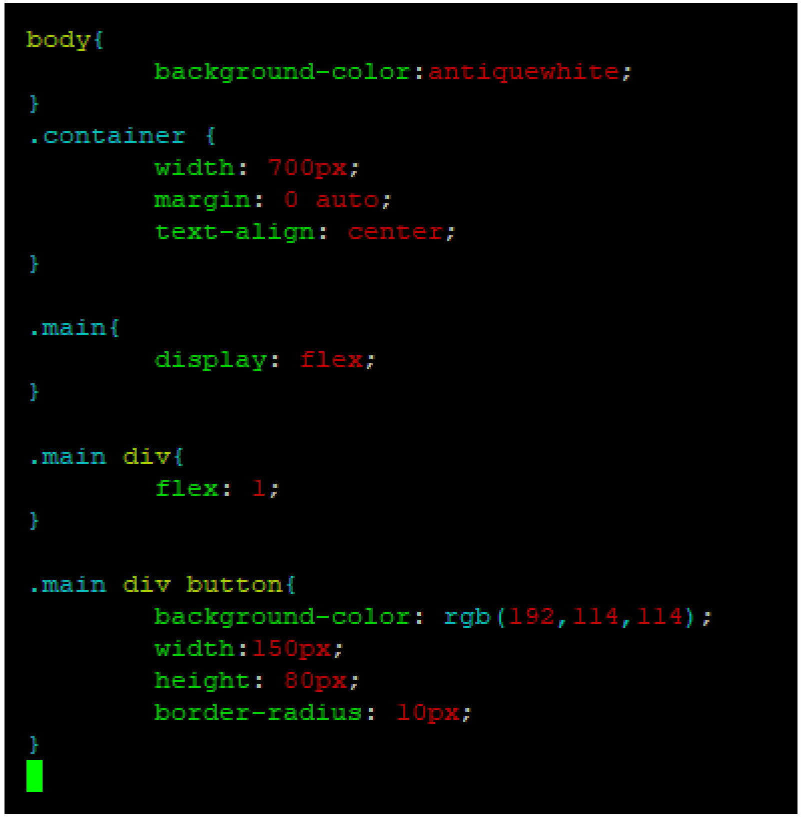
박하늘

1. Flask based home network

1) flask_based_home_network.py
2) statics > style.css



```
from flask import Flask, request
from flask import render_template
import RPi.GPIO as GPIO

app = Flask(__name__)
GPIO.setmode(GPIO.BOARD)
GPIO.setup(12, GPIO.OUT, initial = GPIO.LOW)

@app.route("/")
def home():
    return render_template("index.html")

@app.route("/led/on")
def led_on():
    try:
        GPIO.output(12, GPIO.HIGH)
        return "ok"
    except expression as identifier:
        return "fail"

@app.route("/led/off")
def led_off():
    try:
        GPIO.output(12, GPIO.LOW)
        return "ok"
    except expression as identifier:
        return "fail"

if __name__ == "__main__":
    app.run(host="0.0.0.0")
```

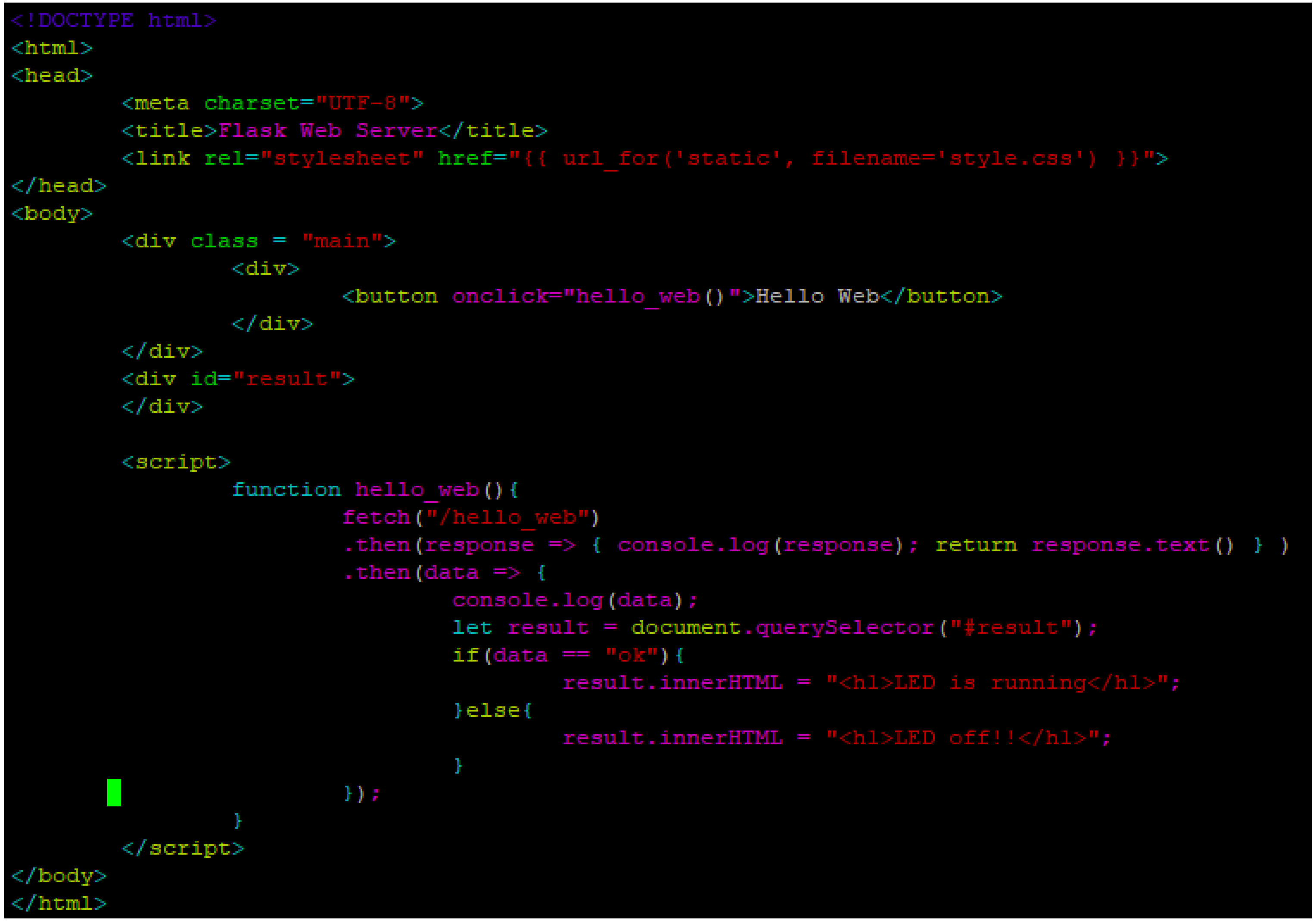


```
body{
        background-color:antiquewhite;
}
.container {
        width: 700px;
        margin: 0 auto;
        text-align: center;
}

.main{
        display: flex;
}

.main div{
        flex: 1;
}

.main div button{
        background-color: rgb(192,114,114);
        width:150px;
        height: 80px;
        border-radius: 10px;
}
```

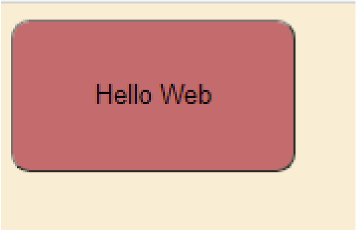
1. Flask based home network

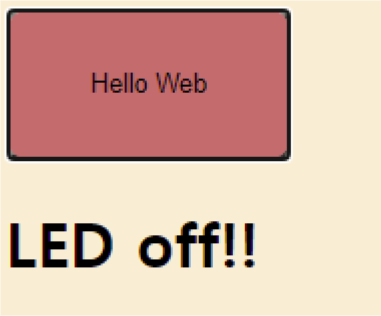
1) template > index.html

- LED Button ON 안됨, 다스 소스 확인 필요



```
<!DOCTYPE html>
<html>
<head>
        <meta charset="UTF-8">
        <title>Flask Web Server</title>
        <link rel="stylesheet" href="{{ url_for('static', filename='style.css') }}">
</head>
<body>
        <div class = "main">
                <div>
                        <button onclick="hello_web()">Hello Web</button>
                </div>
        </div>
        <div id="result">
        </div>

        <script>
                function hello_web(){
                        fetch("/hello_web")
                        .then(response => { console.log(response); return response.text() } )
                        .then(data => {
                                console.log(data);
                                let result = document.querySelector("#result");
                                if(data == "ok"){
                                        result.innerHTML = "<h1>LED is running</h1>";
                                }else{
                                        result.innerHTML = "<h1>LED off!!</h1>";
                                }
                        });
                }
        </script>
</body>
</html>
```

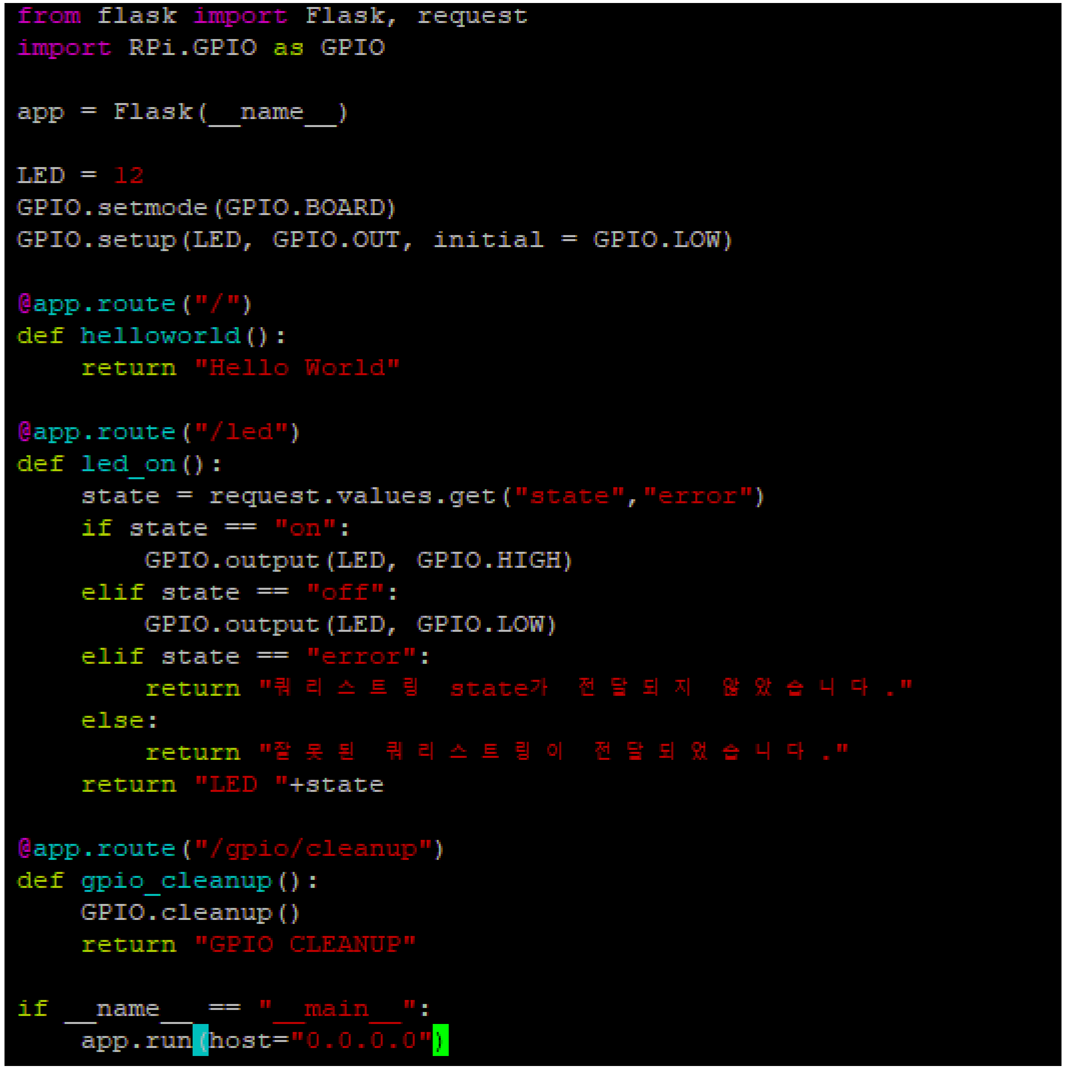




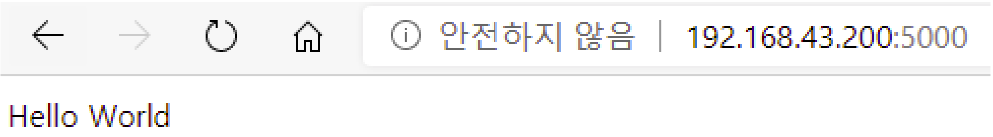
LED off!!

2. Flask based web server

1) Flask_based_web_server.py

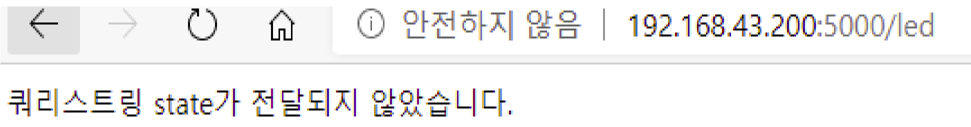


```
from flask import Flask, request
import RPi.GPIO as GPIO

app = Flask(__name__)

LED = 12
GPIO.setmode(GPIO.BOARD)
GPIO.setup(LED, GPIO.OUT, initial = GPIO.LOW)

@app.route("/")
def helloworld():
    return "Hello World"

@app.route("/led")
def led_on():
    state = request.values.get("state","error")
    if state == "on":
        GPIO.output(LED, GPIO.HIGH)
    elif state == "off":
        GPIO.output(LED, GPIO.LOW)
    elif state == "error":
        return "쿼리스트링 state가 전달되지 않았습니다."
    else:
        return "잘못된 쿼리스트링이 전달되었습니다."
    return "LED "+state

@app.route("/gpio/cleanup")
def gpio_cleanup():
    GPIO.cleanup()
    return "GPIO CLEANUP"

if __name__ == "__main__":
    app.run(host="0.0.0.0")
```



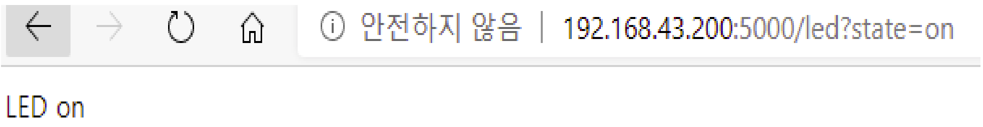
ⓘ 안전하지 않음 | 192.168.43.200:5000

Hello World



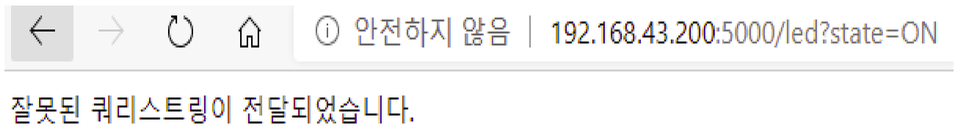
ⓘ 안전하지 않음 | 192.168.43.200:5000/led

쿼리스트링 state가 전달되지 않았습니다.



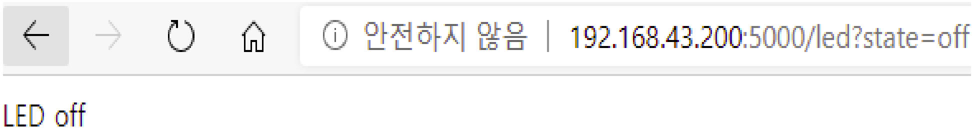
ⓘ 안전하지 않음 | 192.168.43.200:5000/led?state=on

LED on



ⓘ 안전하지 않음 | 192.168.43.200:5000/led?state=ON

잘못된 쿼리스트링이 전달되었습니다.

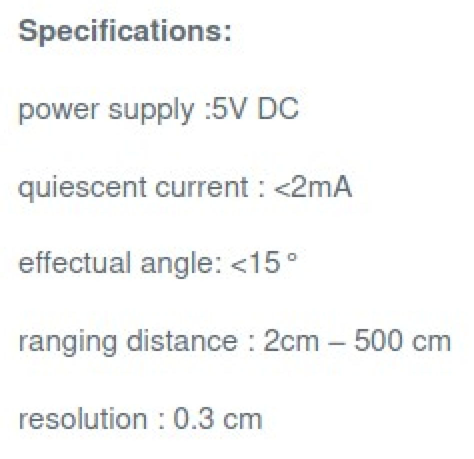


ⓘ 안전하지 않음 | 192.168.43.200:5000/led?state=off

LED off

3. ultrasonic wave control

2) 초음파 거리센서 HC-SR04



Specifications:

power supply :5V DC

quiescent current : <2mA

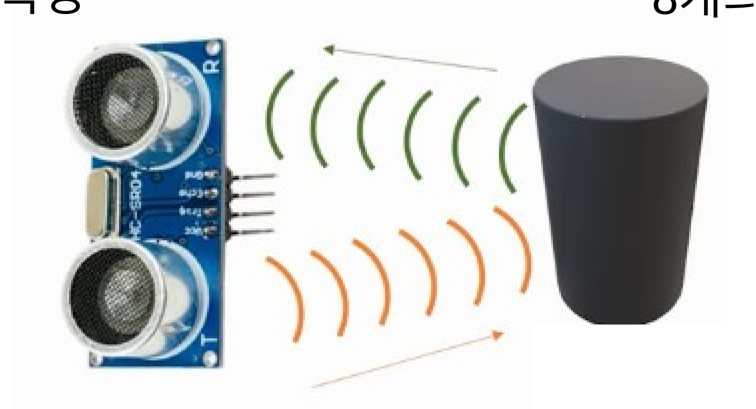
effectual angle: <15 °

ranging distance : 2cm – 500 cm

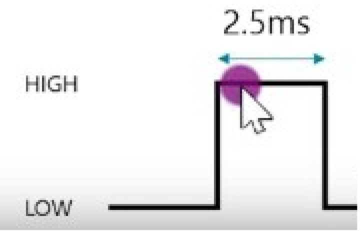
resolution : 0.3 cm

Echo핀을 High로 올려
거리 측정

8개의 초음파



10us동안 high 신호

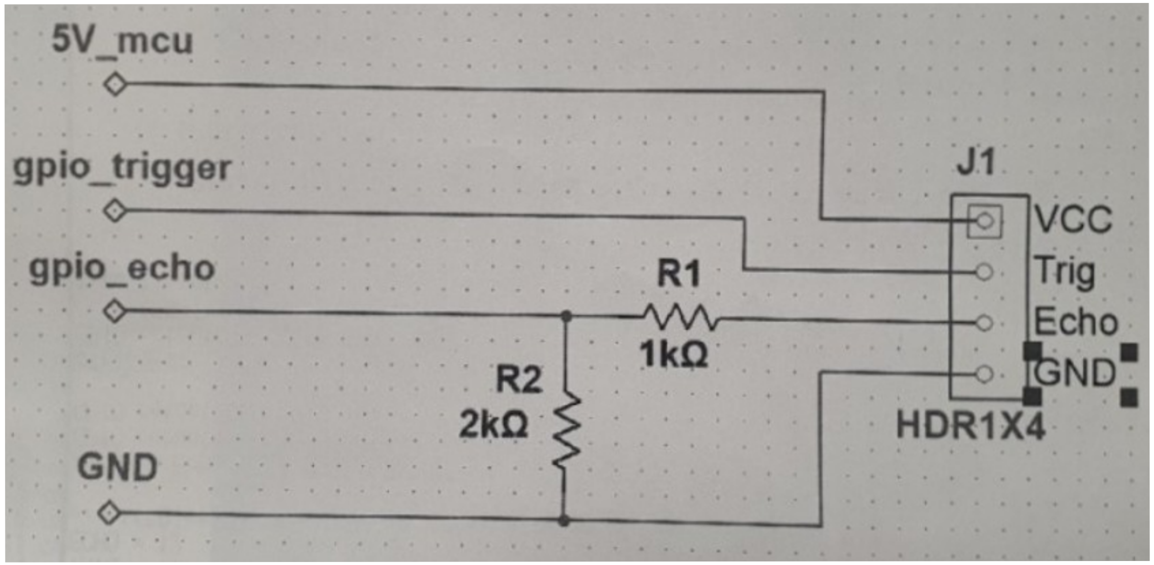


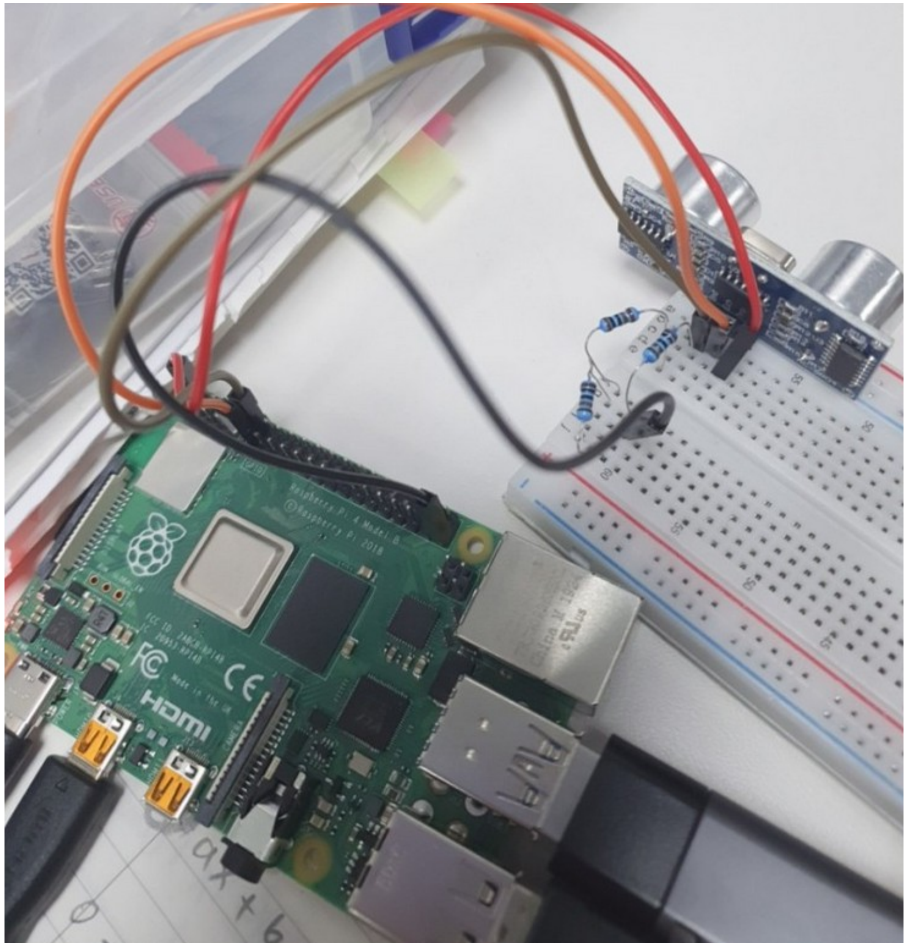
해당 Pulse width 길이를 ms단위로 반환

3. ultrasonic wave control

2) ultrasonic_wave_control circuit

- trigger 11번, echo 12번, 전원 5V

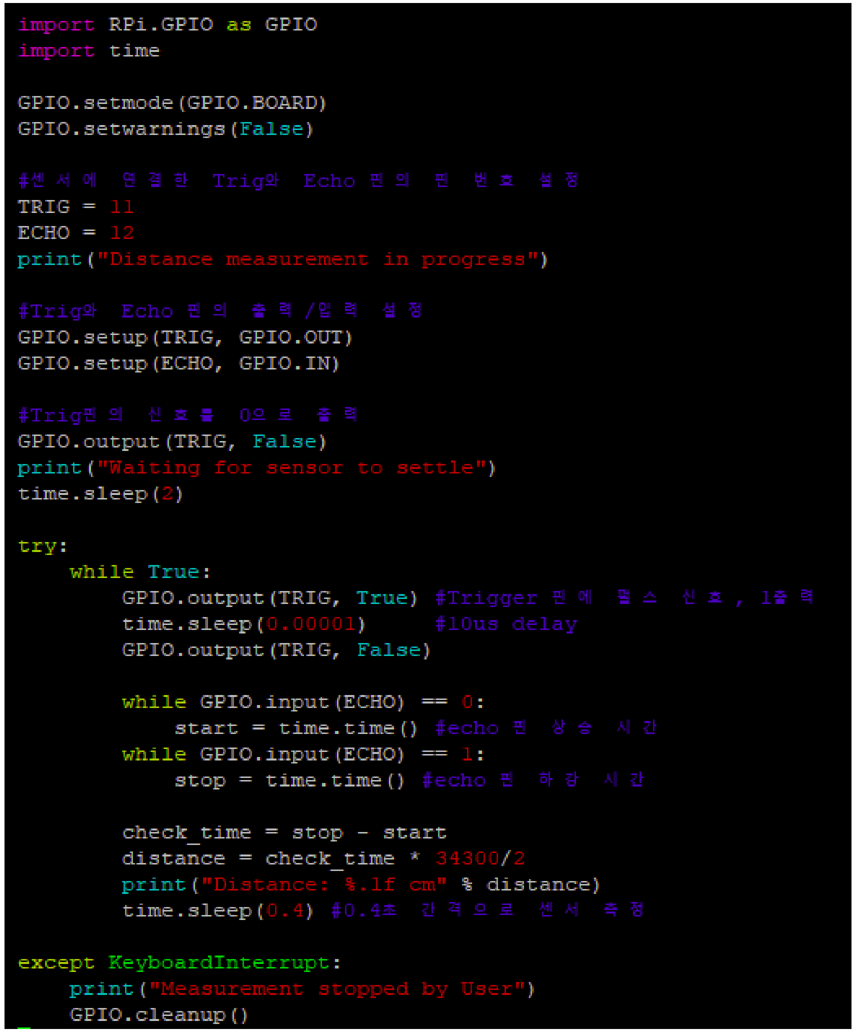




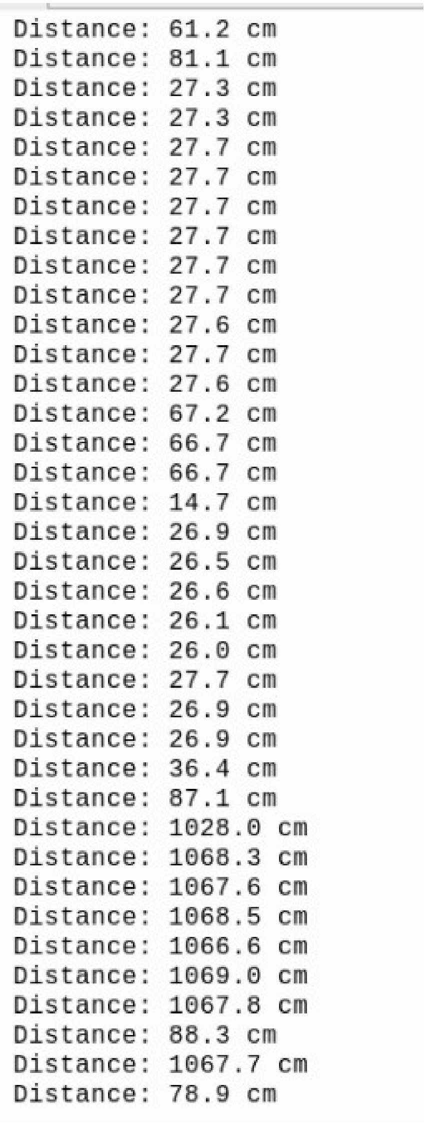
3. ultrasonic wave control

3) ultrasonic_wave_control.py

- TRIG 핀으로 신호를 보내고, ECHO 핀으로 신호를 받는다.



```
import RPi.GPIO as GPIO
import time

GPIO.setmode(GPIO.BOARD)
GPIO.setwarnings(False)

#센서에 연결한 Trig와 Echo 핀의 핀 번호 설정
TRIG = 11
ECHO = 12
print("Distance measurement in progress")

#Trig와 Echo 핀의 출력/입력 설정
GPIO.setup(TRIG, GPIO.OUT)
GPIO.setup(ECHO, GPIO.IN)

#Trig핀의 신호를 0으로 출력
GPIO.output(TRIG, False)
print("Waiting for sensor to settle")
time.sleep(2)

try:
    while True:
        GPIO.output(TRIG, True) #Trigger 핀에 펄스 신호, 1출력
        time.sleep(0.00001)     #10us delay
        GPIO.output(TRIG, False)

        while GPIO.input(ECHO) == 0:
            start = time.time() #echo 핀 상승 시간
        while GPIO.input(ECHO) == 1:
            stop = time.time() #echo 핀 하강 시간

        check_time = stop - start
        distance = check_time * 34300/2
        print("Distance: %.1f cm" % distance)
        time.sleep(0.4) #0.4초 간격으로 센서 측정

except KeyboardInterrupt:
    print("Measurement stopped by User")
    GPIO.cleanup()
```

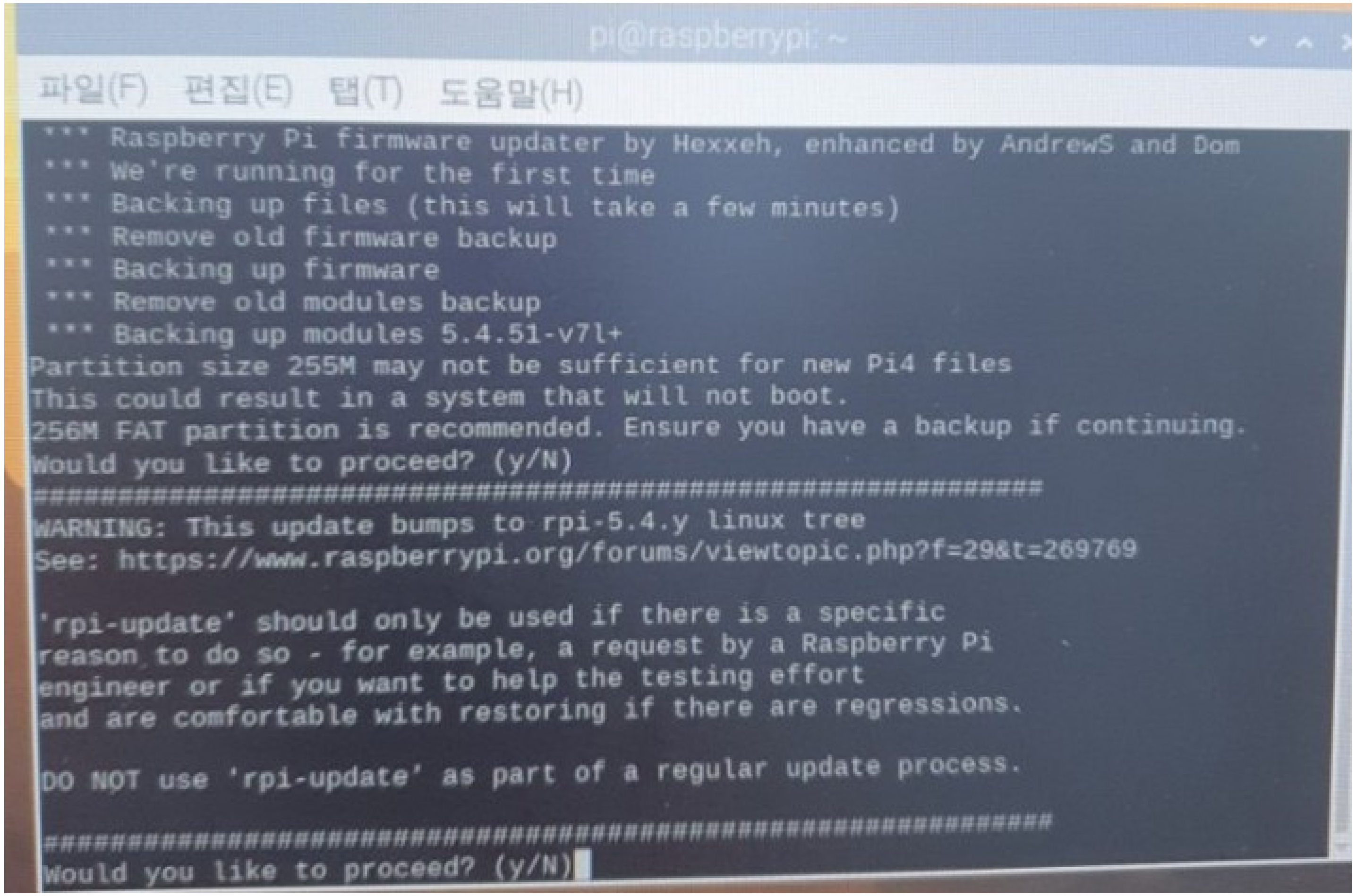


```
Distance: 61.2 cm
Distance: 81.1 cm
Distance: 27.3 cm
Distance: 27.3 cm
Distance: 27.7 cm
Distance: 27.7 cm
Distance: 27.7 cm
Distance: 27.7 cm
Distance: 27.7 cm
Distance: 27.7 cm
Distance: 27.6 cm
Distance: 27.7 cm
Distance: 27.6 cm
Distance: 67.2 cm
Distance: 66.7 cm
Distance: 66.7 cm
Distance: 14.7 cm
Distance: 26.9 cm
Distance: 26.5 cm
Distance: 26.6 cm
Distance: 26.1 cm
Distance: 26.0 cm
Distance: 27.7 cm
Distance: 26.9 cm
Distance: 26.9 cm
Distance: 36.4 cm
Distance: 87.1 cm
Distance: 1028.0 cm
Distance: 1068.3 cm
Distance: 1067.6 cm
Distance: 1068.5 cm
Distance: 1066.6 cm
Distance: 1069.0 cm
Distance: 1067.8 cm
Distance: 88.3 cm
Distance: 1067.7 cm
Distance: 78.9 cm
```

4. UV4L based web streaming

1) 여기까지 수행 완료, 이후 패키지 목록 부터는 문제 발생

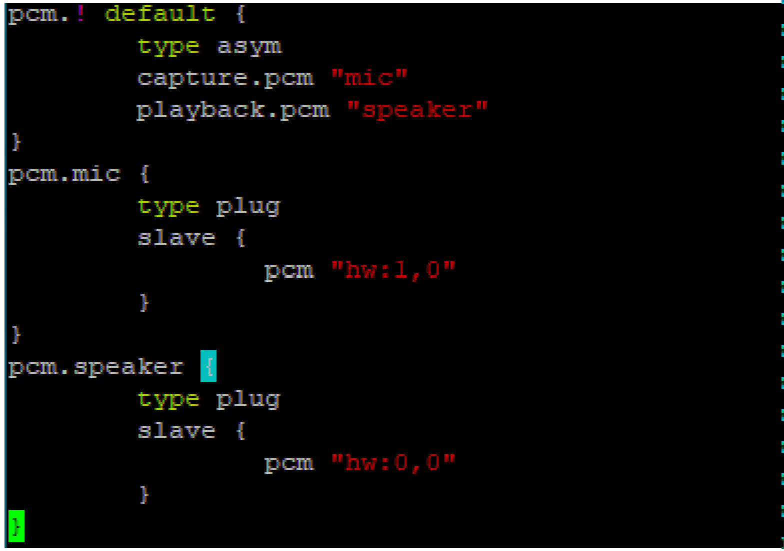
- 다시 확인 필요



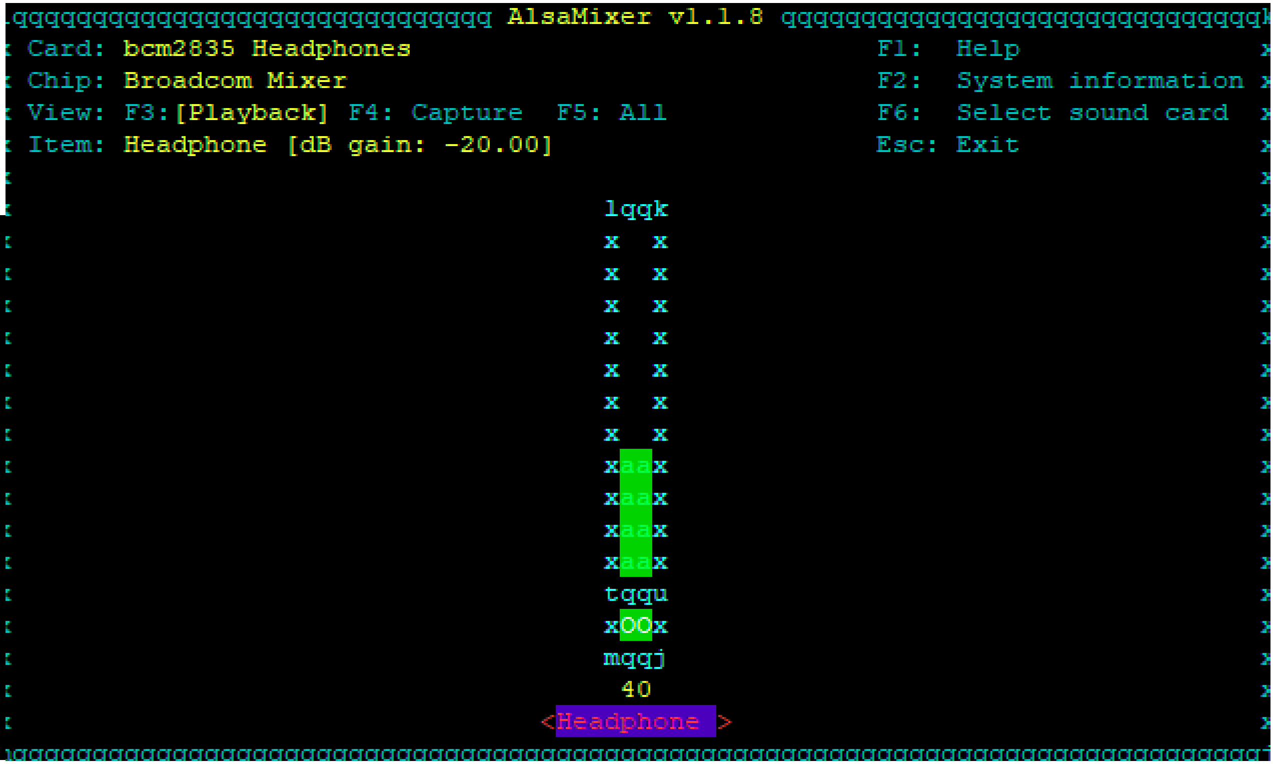
```
 *** Raspberry Pi firmware updater by Hexxeh, enhanced by AndrewS and Dom
 *** We're running for the first time
 *** Backing up files (this will take a few minutes)
 *** Remove old firmware backup
 *** Backing up firmware
 *** Remove old modules backup
 *** Backing up modules 5.4.51-v7l+
Partition size 255M may not be sufficient for new Pi4 files
This could result in a system that will not boot.
256M FAT partition is recommended. Ensure you have a backup if continuing.
Would you like to proceed? (y/N)
#############################################################
WARNING: This update bumps to rpi-5.4.y linux tree
See: https://www.raspberrypi.org/forums/viewtopic.php?f=29&t=269769

'rpi-update' should only be used if there is a specific
reason to do so - for example, a request by a Raspberry Pi
engineer or if you want to help the testing effort
and are comfortable with restoring if there are regressions.

DO NOT use 'rpi-update' as part of a regular update process.

#############################################################
Would you like to proceed? (y/N)
```

5. Google assistance

1) vi ~/.asoundrc작성 및 alsamixer결과



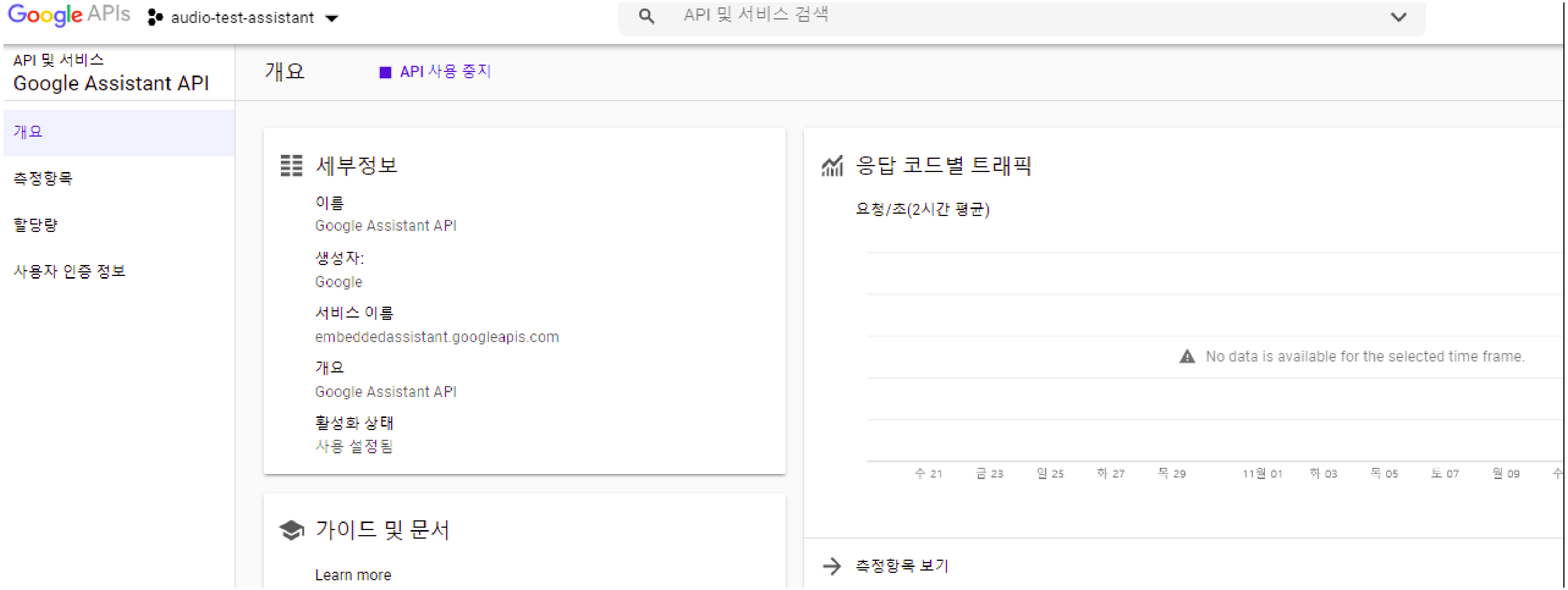
```
pcm.! default {
        type asym
        capture.pcm "mic"
        playback.pcm "speaker"
}
pcm.mic {
        type plug
        slave {
                pcm "hw:1,0"
        }
}
pcm.speaker {
        type plug
        slave {
                pcm "hw:0,0"
        }
}
```



```
lqqqqqqqqqqqqqqqqqqqqqqqqqqqqqq AlsaMixer v1.1.8 qqqqqqqqqqqqqqqqqqqqqqqqqqqqqqk
x Card: bcm2835 Headphones                                  F1:  Help               x
x Chip: Broadcom Mixer                                      F2:  System information x
x View: F3:[Playback] F4: Capture  F5: All                  F6:  Select sound card  x
x Item: Headphone [dB gain: -20.00]                         Esc: Exit               x
x                                                                                   x
x                                     lqqk                                          x
x                                     x  x                                          x
x                                     x  x                                          x
x                                     x  x                                          x
x                                     x  x                                          x
x                                     x  x                                          x
x                                     x  x                                          x
x                                     x  x                                          x
x                                     xaax                                          x
x                                     xaax                                          x
x                                     xaax                                          x
x                                     xaax                                          x
x                                     tqqu                                          x
x                                     xOOx                                          x
x                                     mqqj                                          x
x                                      40                                           x
x                                 <Headphone >                                      x
mqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqqj
```

5. Google assistance

2) google assistance에서 audio-test-assistant API 프로젝트 만듦



Google APIs audio-test-assistant ▾

API 및 서비스 검색

API 및 서비스
Google Assistant API

개요 ■ API 사용 중지

- 개요
- 측정항목
- 할당량
- 사용자 인증 정보

세부정보

이름
Google Assistant API

생성자:
Google

서비스 이름
embeddedassistant.googleapis.com

개요
Google Assistant API

활성화 상태
사용 설정됨

가이드 및 문서

Learn more

응답 코드별 트래픽

요청/초(2시간 평균)

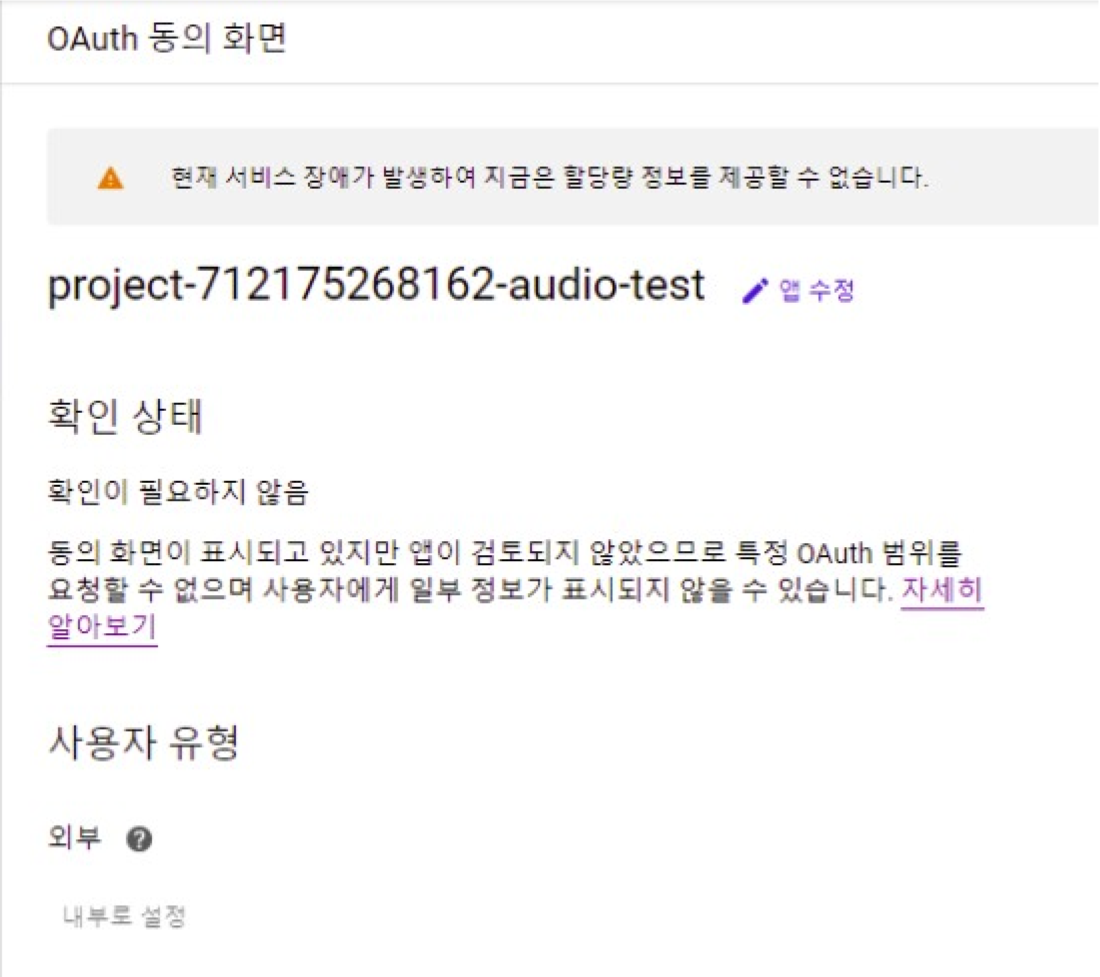
No data is available for the selected time frame.

→ 측정항목 보기

5. Google assistance

3) OAuth동의 화면

- Q. 할당량 정보를 제공할 수 없다는 에러 확인 필요



OAuth 동의 화면

⚠ 현재 서비스 장애가 발생하여 지금은 할당량 정보를 제공할 수 없습니다.

project-712175268162-audio-test ✏ 앱 수정

확인 상태

확인이 필요하지 않음

동의 화면이 표시되고 있지만 앱이 검토되지 않았으므로 특정 OAuth 범위를 요청할 수 없으며 사용자에게 일부 정보가 표시되지 않을 수 있습니다. 자세히 알아보기

사용자 유형

외부 ?

내부로 설정