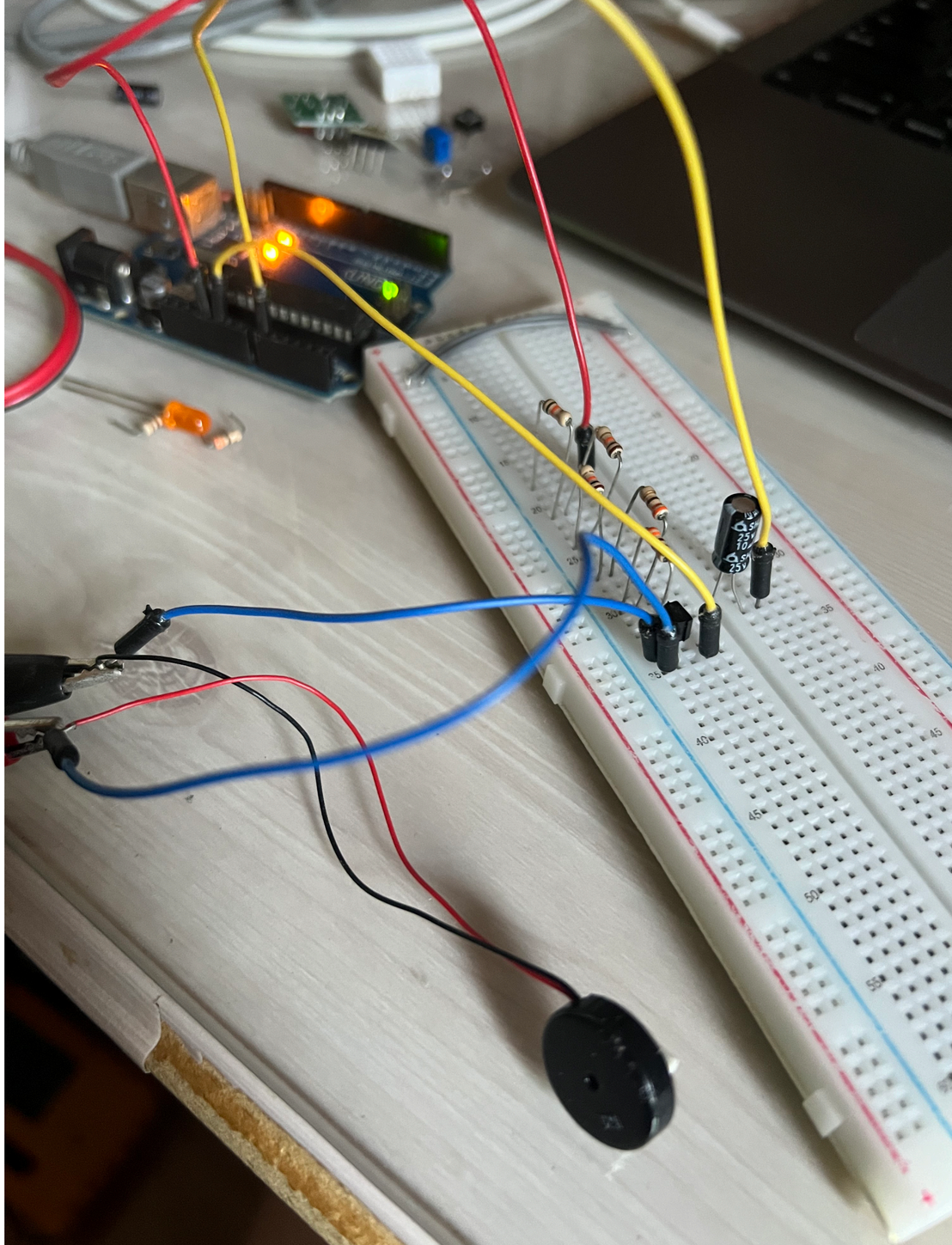
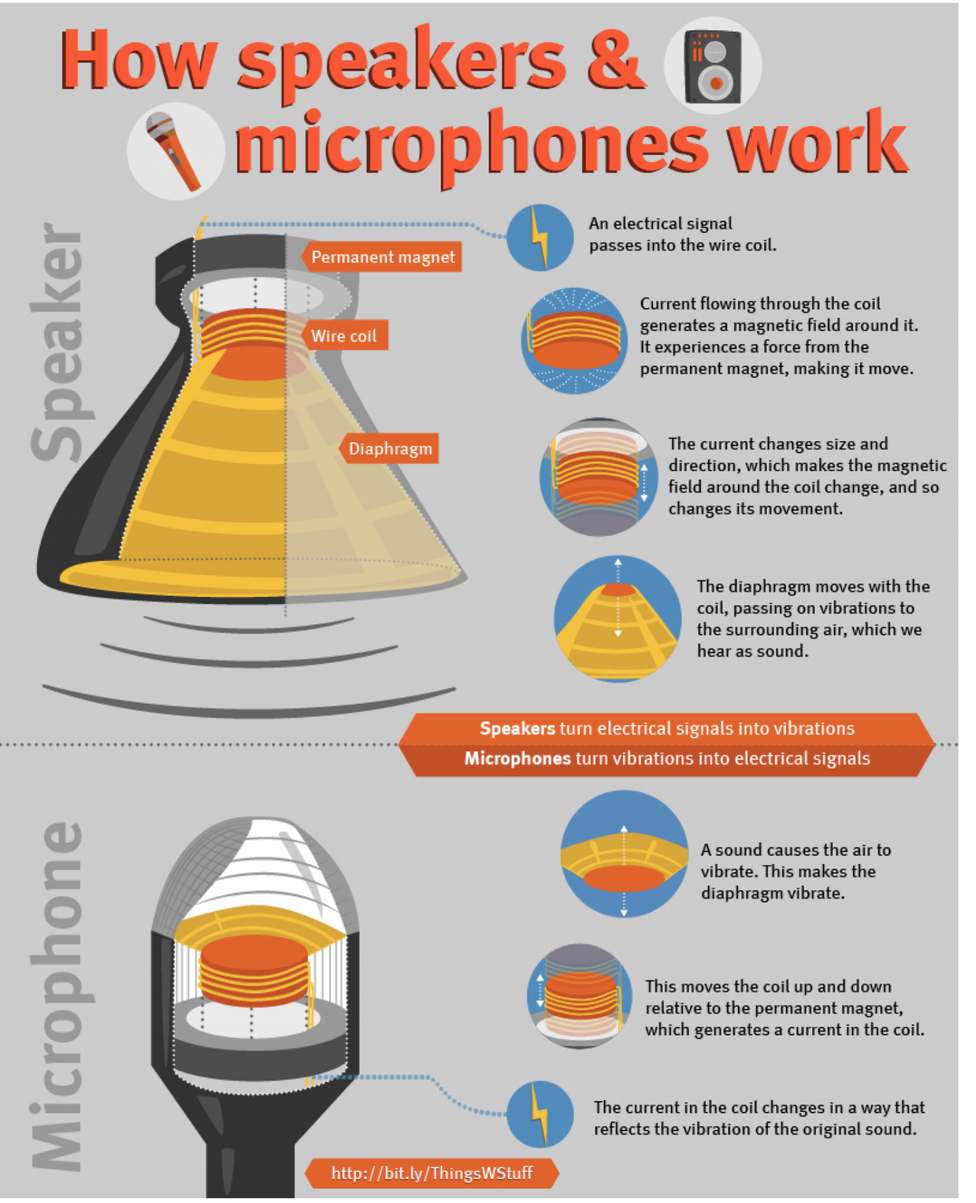
아두이노로 마이크 샘플링해서 녹음하기

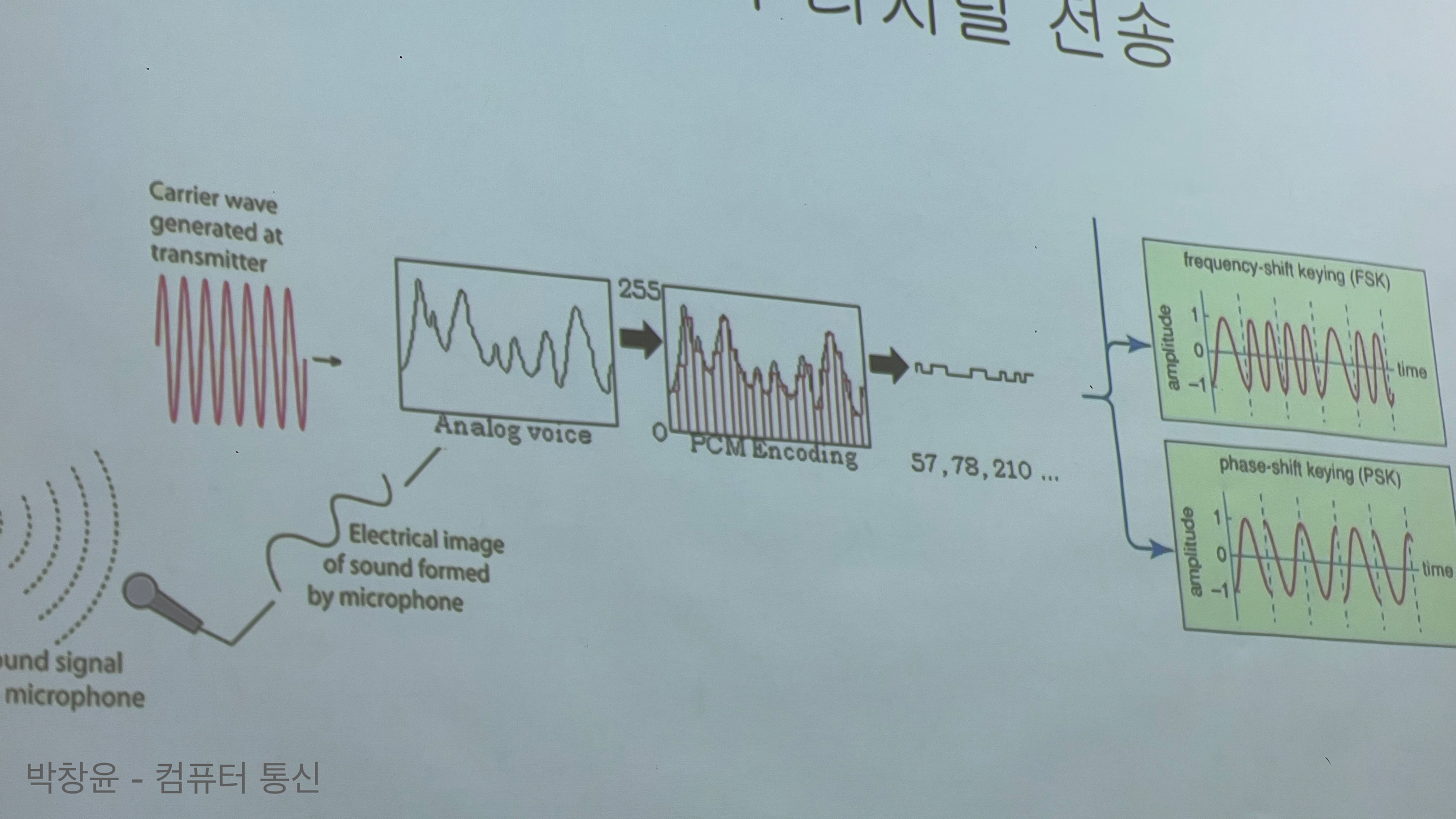
조영호



왜?

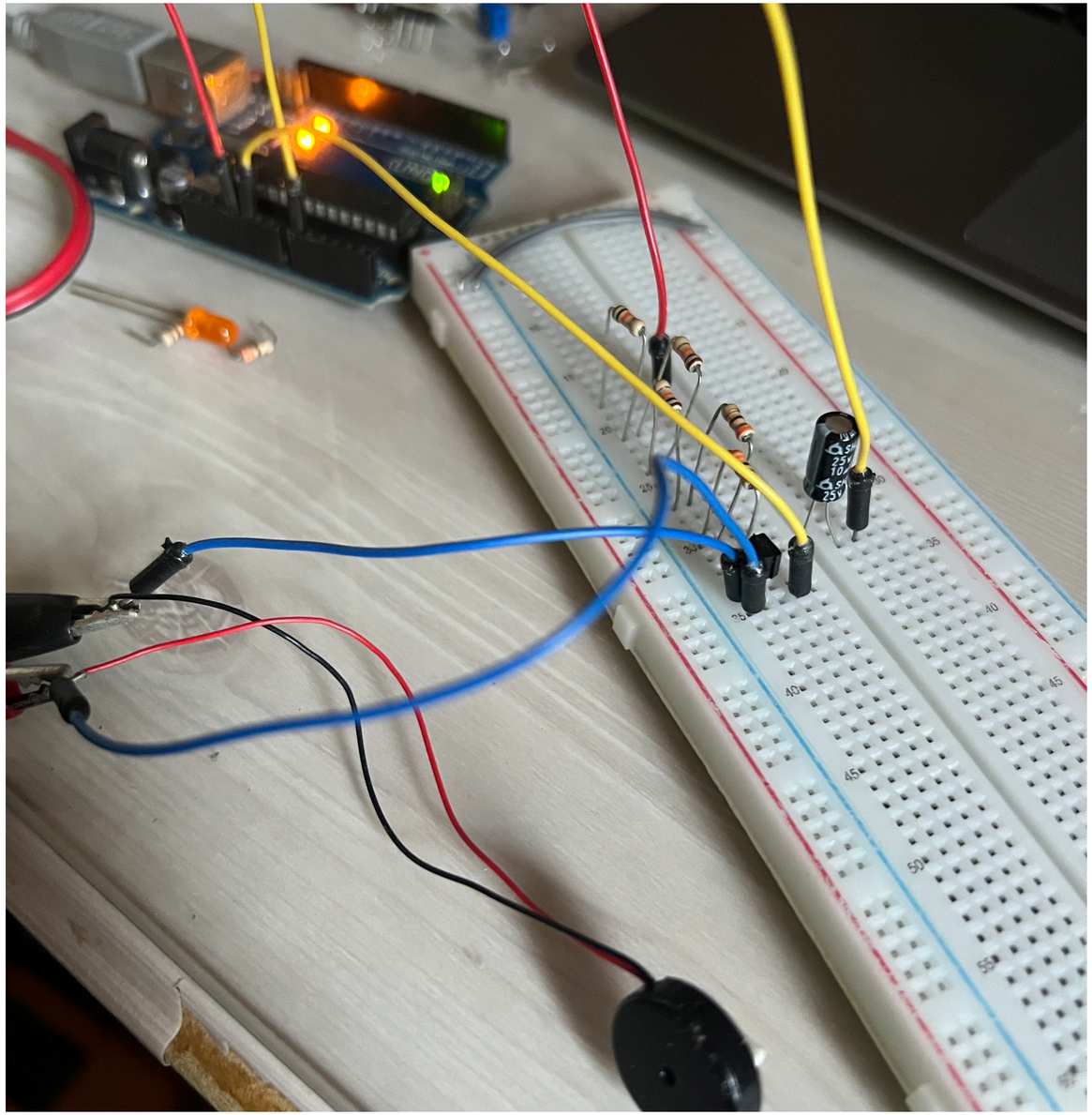


https://visual.ly/community/Infographics/technology/how-speakers-and-microphones-work


Carrier wave generated at transmitter
Analog voice
255
0
PCM Encoding
57, 78, 210 ...
frequency-shift keying (FSK)
amplitude
1
0
−1
time
phase-shift keying (PSK)
amplitude
1
0
−1
time
Electrical image of sound formed by microphone
und signal
microphone

개발

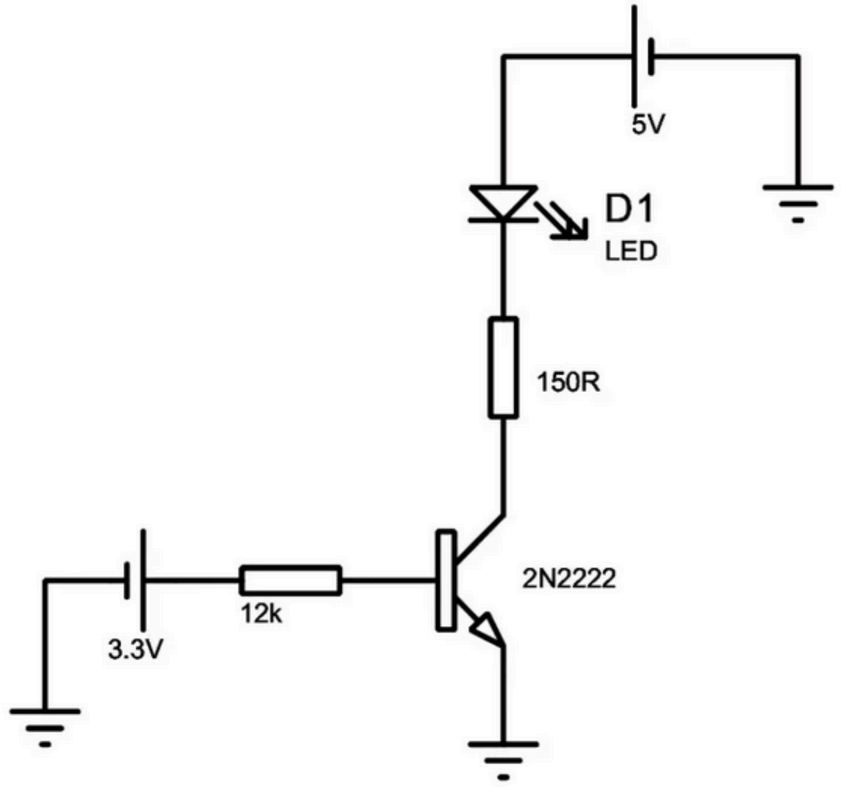
회로



TMI: 전자전기 복전 신청했다가 접음

개발

회로



2n2222 transistor as a switch

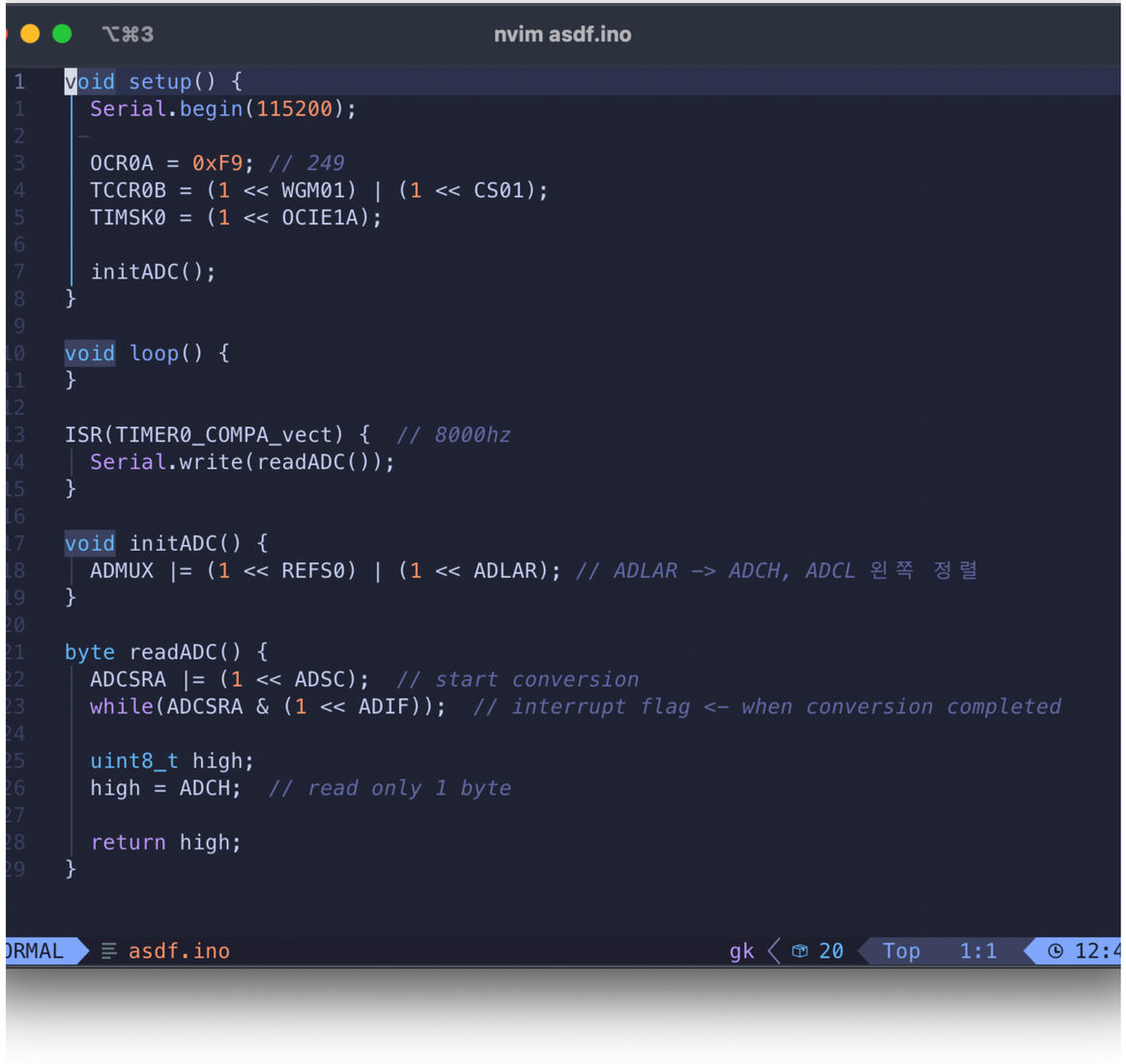
https://www.npntransistors.com/2n2222-transistor-datasheet/

개발

코드

~~delay(1);~~

~~analogRead(A0);~~



개발

ADC Datasheet

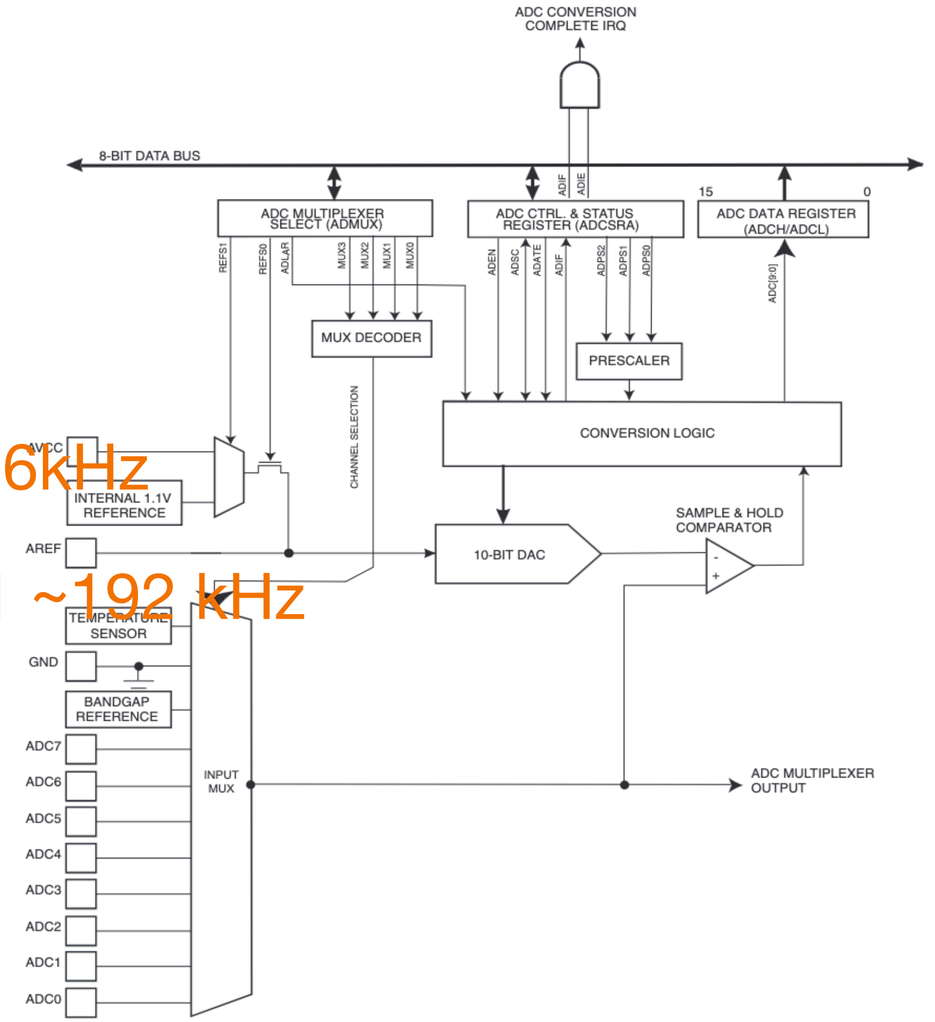
- ATmega328 ADC 분해능: 10bit

- 8bit / 8kHz

Youtube: 16bit, 24bit / 44.1 ~ 96kHz

Apple music: 16bit, 24bit / 44.1 ~192 kHz

igure 24-1. Analog to Digital Converter Block Schematic Operation

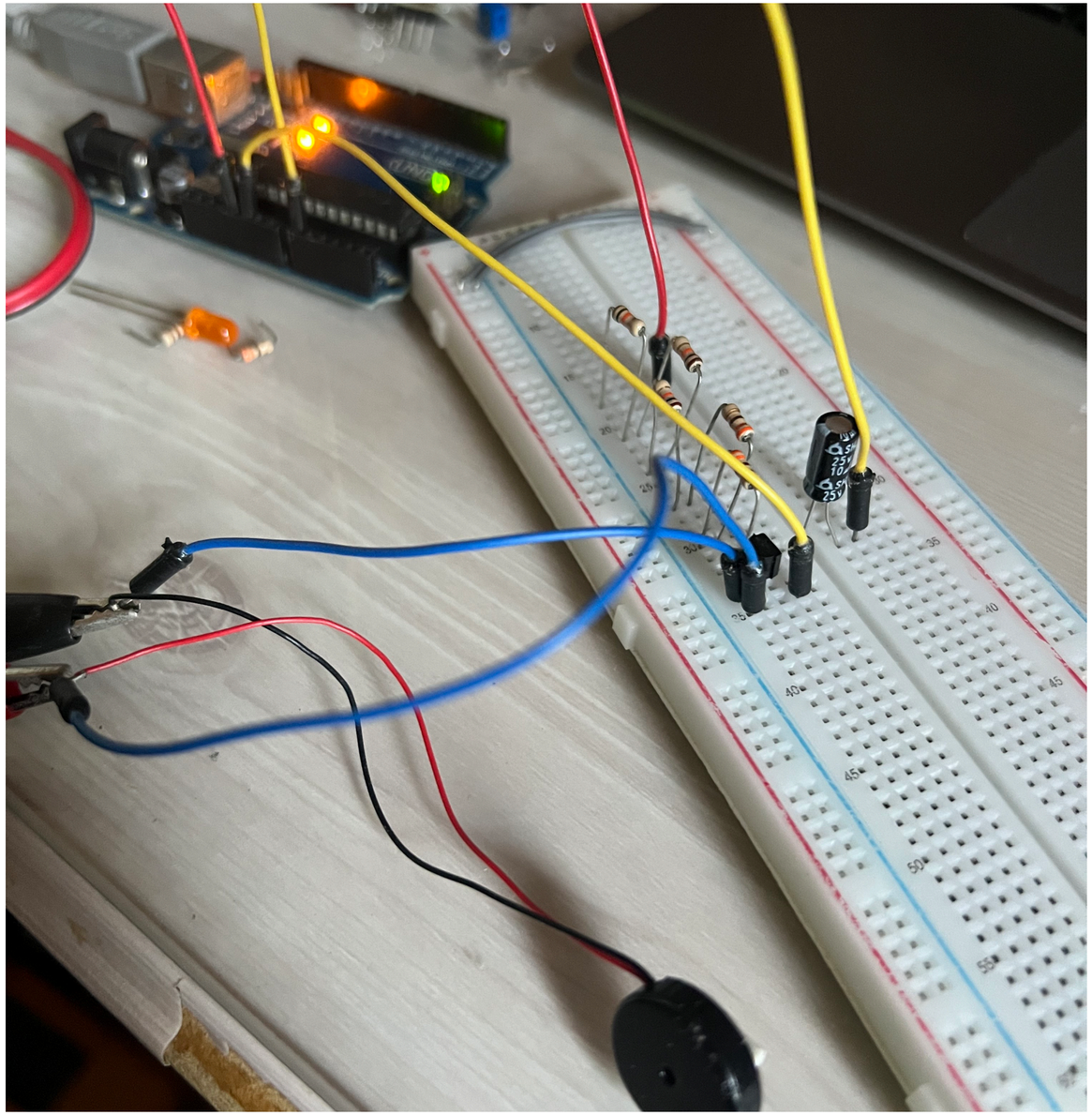


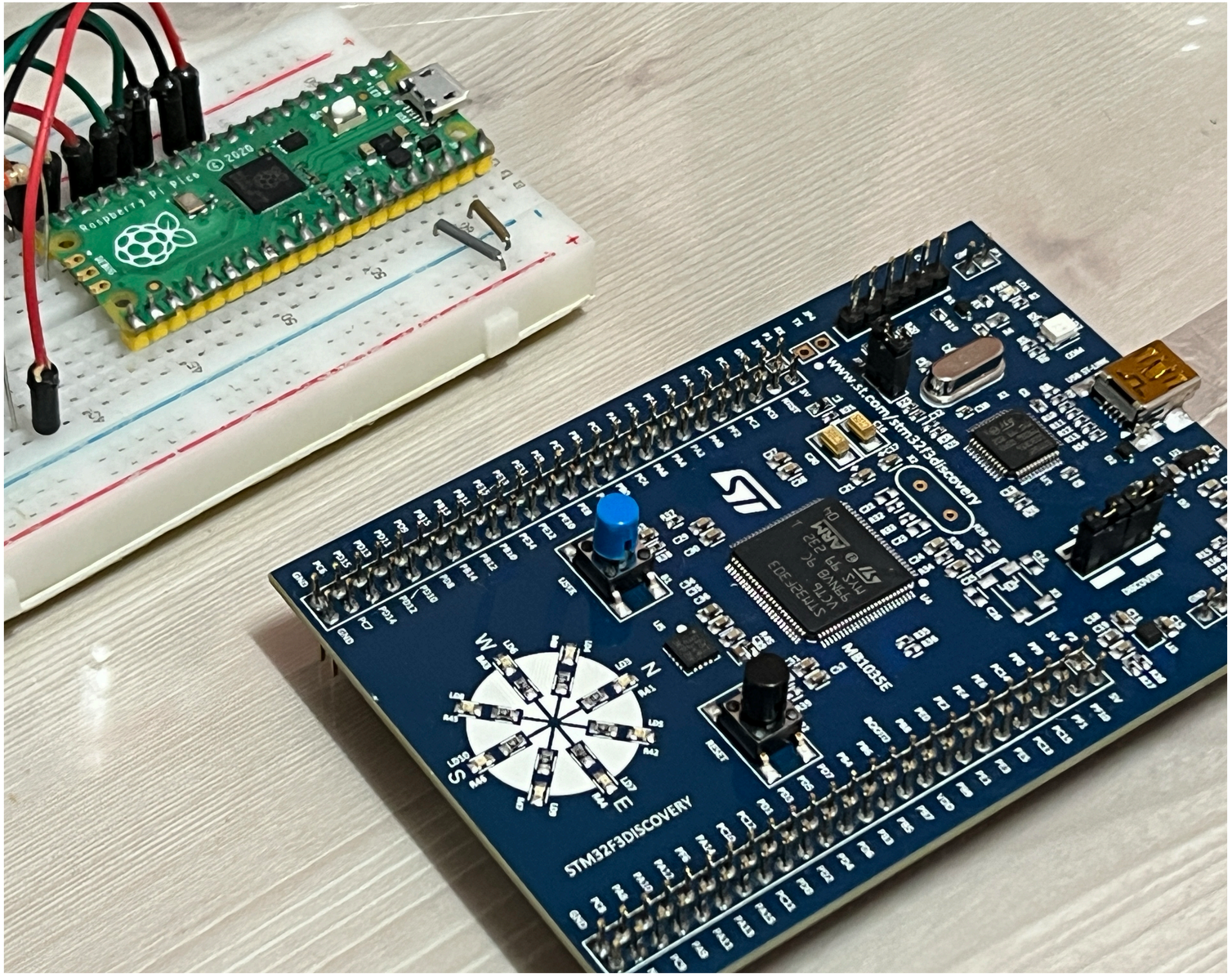
24.9.3.2 ADLAR = 1

Bit	15	14	13	12	11	10	9	8	
(0x79)	ADC9	ADC8	ADC7	ADC6	ADC5	ADC4	ADC3	ADC2	ADCH
(0x78)	ADC1	ADC0	–	–	–	–	–	–	ADCL
	7	6	5	4	3	2	1	0	
Read/Write	R	R	R	R	R	R	R	R	
	R	R	R	R	R	R	R	R	
Initial Value	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	

When an ADC conversion is complete, the result is found in these two registers.

결과





- 더 높은 분해능 (12bit)

- 더 높은 샘플링 래이트 (44kHz)

- 더 좋은 AMP

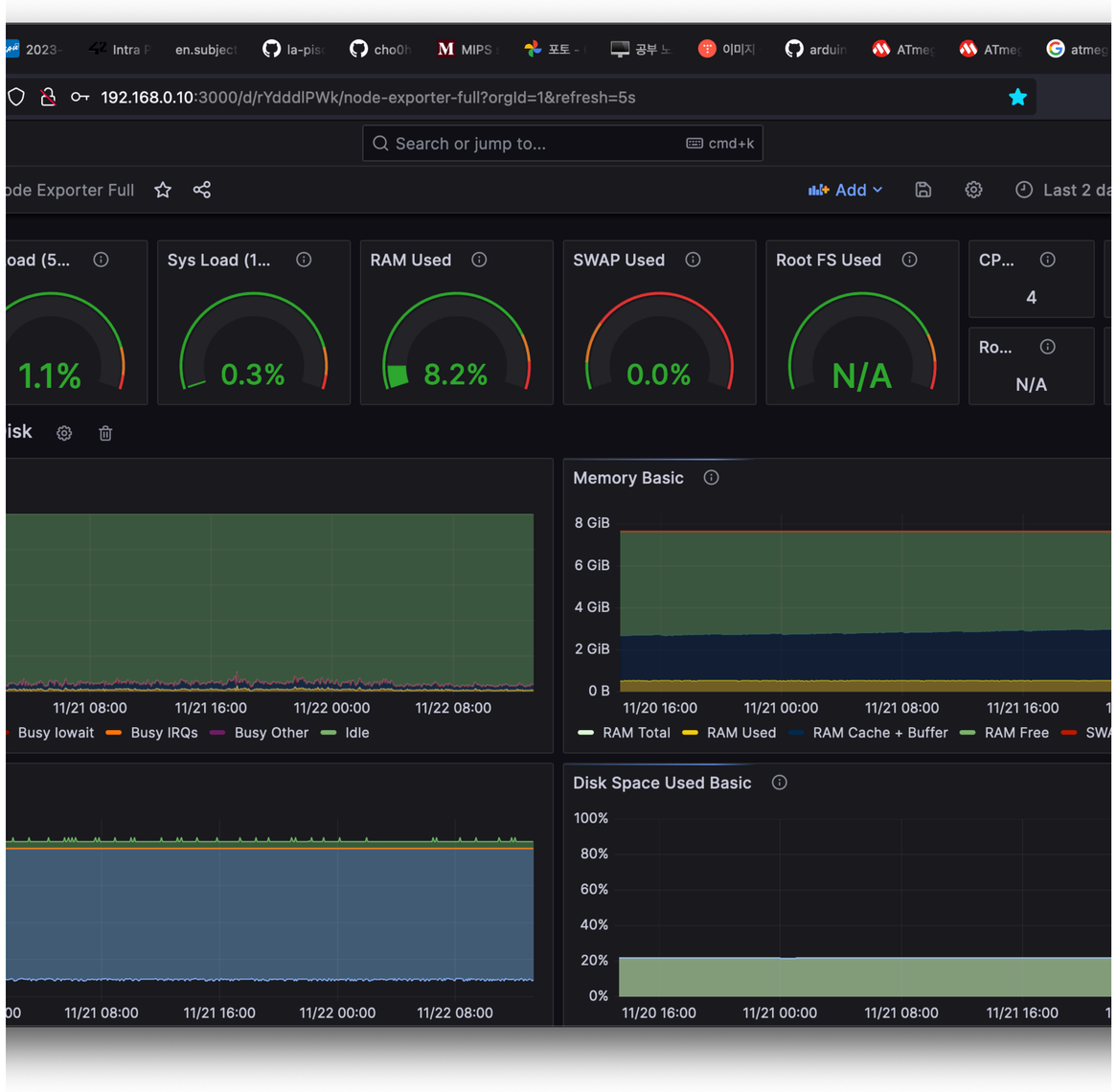
- 더 좋은 mic소자

감사합니..


Weather - Indoor - Dashboards
192.168.0.10:3000/d/aa1126c9-c934-4ed2-b06d-6ca9aa0c522c/weather-indoor?orgId=1&refresh=5s&from=now-2d&to=
Search or jump to...
cmd+k
Temperature
Humidity
24.8 °C
45.9 %H
10/01 16:00
10/02 00:00
10/02 08:00
Pressure
1025.00 hPa
1020.00 hPa
1015.00 hPa
1010.00 hPa
1005.00 hPa
1000.00 hPa
09/30 16:00
10/01 00:00
10/01 08:00
pressure bmp180 / 100
MacBook Air

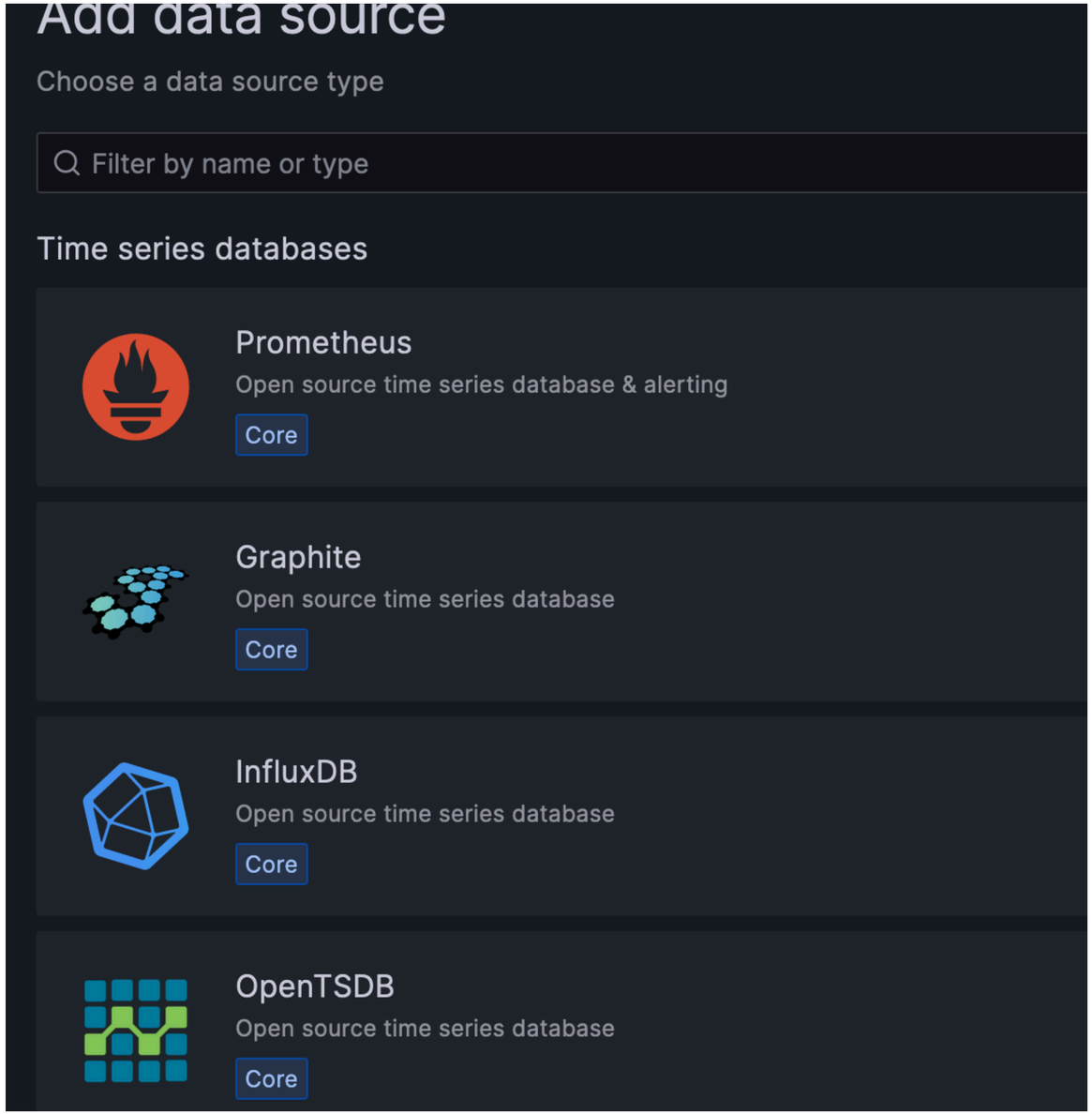
개요

Grafana란?


192.168.0.10:3000/d/rYdddlPWk/node-exporter-full?orgId=1&refresh=5s
Search or jump to...
cmd+k
Add
Load (5...
Sys Load (1...
RAM Used
SWAP Used
Root FS Used
CP...
4
Ro...
N/A
1.1%
0.3%
8.2%
0.0%
N/A
Memory Basic
8 GiB
6 GiB
4 GiB
2 GiB
0 B
11/21 08:00
11/21 16:00
11/22 00:00
11/22 08:00
Busy Iowait
Busy IRQs
Busy Other
Idle
11/20 16:00
11/21 00:00
11/21 08:00
11/21 16:00
RAM Total
RAM Used
RAM Cache + Buffer
RAM Free
Disk Space Used Basic
100%
80%
60%
40%
20%
0%

개요

시계열 DB?


Add data source
Choose a data source type
Filter by name or type
Time series databases
Prometheus
Open source time series database & alerting
Core
Graphite
Open source time series database
Core
InfluxDB
Open source time series database
Core
OpenTSDB
Open source time series database
Core

InfluxDB

write

InfluxDB

query

younghoc@joyeonghos-MacBook-Air-2:~/tmp/influx2

```
query2.sh


://192.168.0.10:8087/api/v2/query?org=my-org' \
e: application/vnd.flux' \
lication/csv' \
ion: Token mytokennnnnnnnnn' \
"my-bucket")
 -24h)
(r) => r._measurement == "weather-test")'
```

InfluxDB

설치 (docker compose)


```
⌥⌘3          pi@raspberrypi: ~/tmp
@raspberrypi:~/tmp $ cat docker-compose.yml
rsion: "3.9"
rvices:
weather-influx:
  image: influxdb:latest
  environment:
    - DOCKER_INFLUXDB_INIT_MODE=setup
    - DOCKER_INFLUXDB_INIT_USERNAME=my-userrrrr
    - DOCKER_INFLUXDB_INIT_PASSWORD=my-passwordddddd
    - DOCKER_INFLUXDB_INIT_ORG=my-org
    - DOCKER_INFLUXDB_INIT_BUCKET=my-bucket
    - DOCKER_INFLUXDB_INIT_ADMIN_TOKEN=mytokennnnn
  volumes:
    - ./config:/etc/influxdb2
    - weather-influx:/var/lib/influxdb2
  ports:
    - 8086:8086
  restart: unless-stopped
lumes:
weather-influx:
@raspberrypi:~/tmp $
```

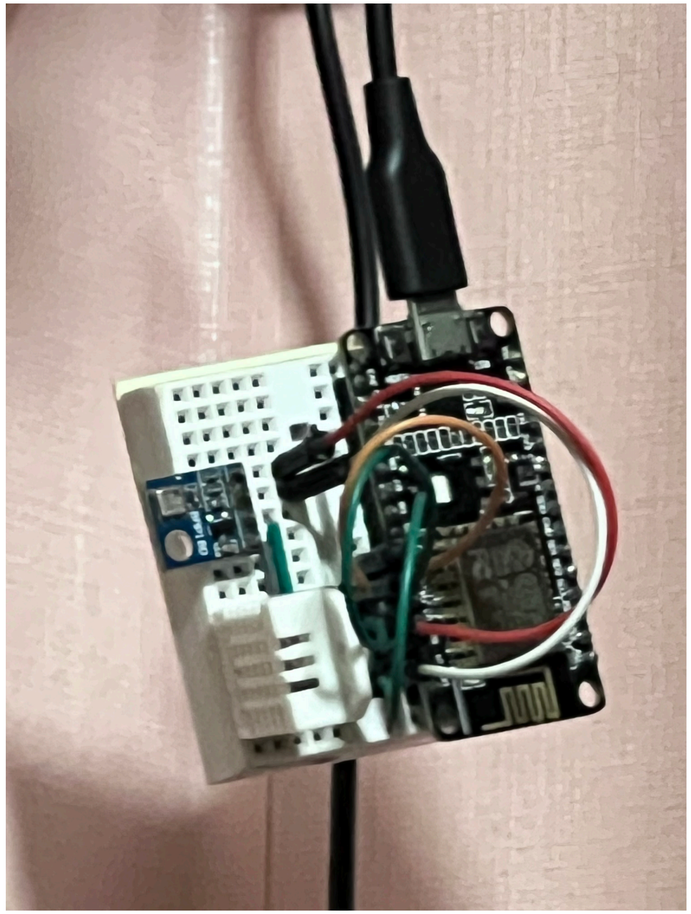
하드웨어

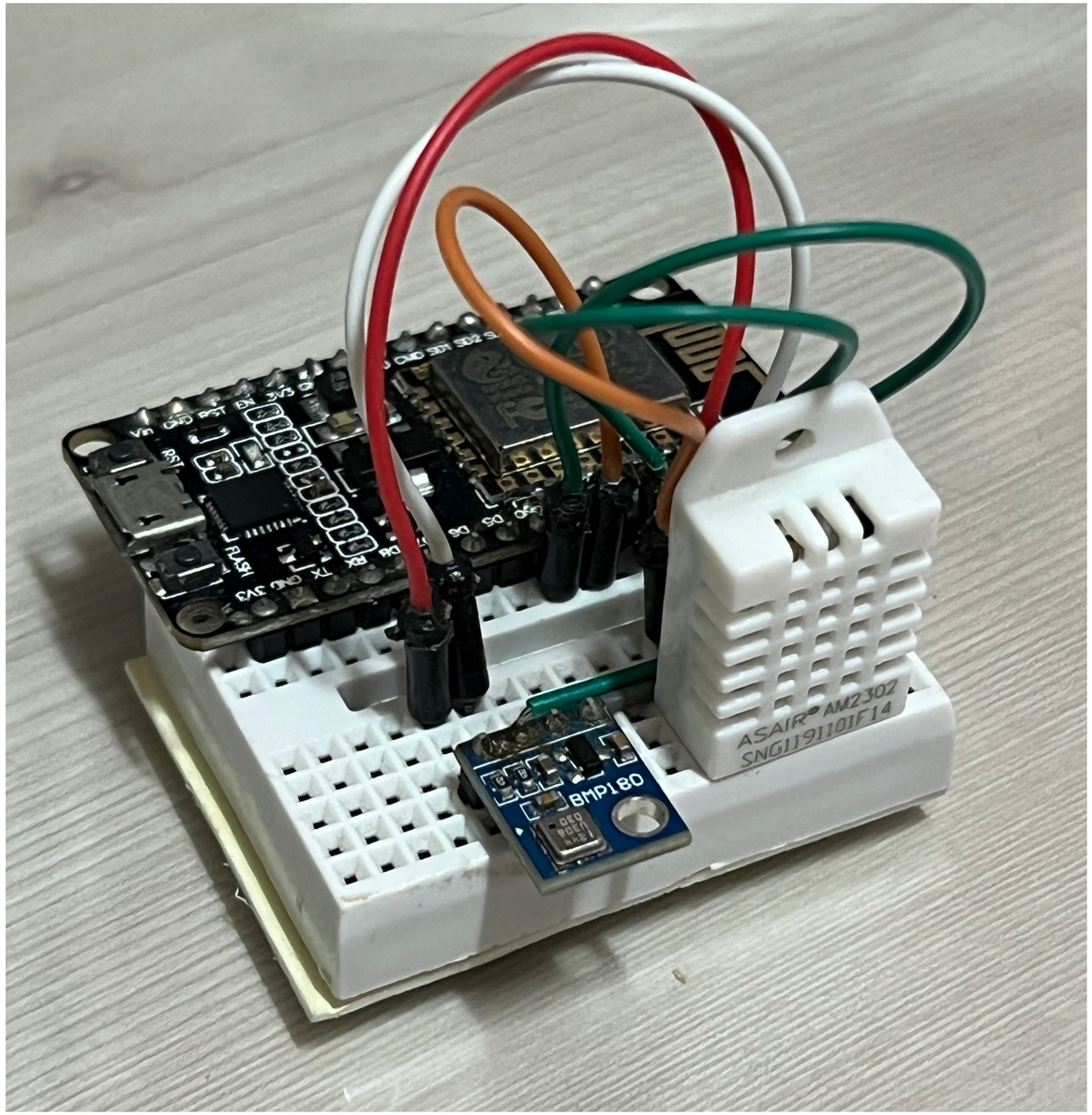
부품

- 온도, 습도 (DHT22)
- 온도, 기압 (BMP180

하드웨어

조립, 설치





소프트웨어

arduino code (생략 버전)

Demo

다음에..

백엽상

- 장치의 소모 전력 측정하기

- sleep mode를 이용하여
  더 오래 작동하도록

- 데이터를 더 드물게 전송하도록

조영호

감사합니다


Weather - Indoor - Dashboards
192.168.0.10:3000/d/aa1126c9-c934-4ed2-b06d-6ca9aa0c522c/weather-indoor?orgId=1&refresh=5s&from=now-2d&to=
Search or jump to...
cmd+k
Add
Temperature
24.8 °C
Humidity
45.9 %H
Pressure
1025.00 hPa
1020.00 hPa
1015.00 hPa
1010.00 hPa
1005.00 hPa
1000.00 hPa
09/30 16:00
10/01 00:00
10/01 08:00
10/01 16:00
pressure bmp180 / 100
10/01 16:00
10/02 00:00
10/02 08:00