

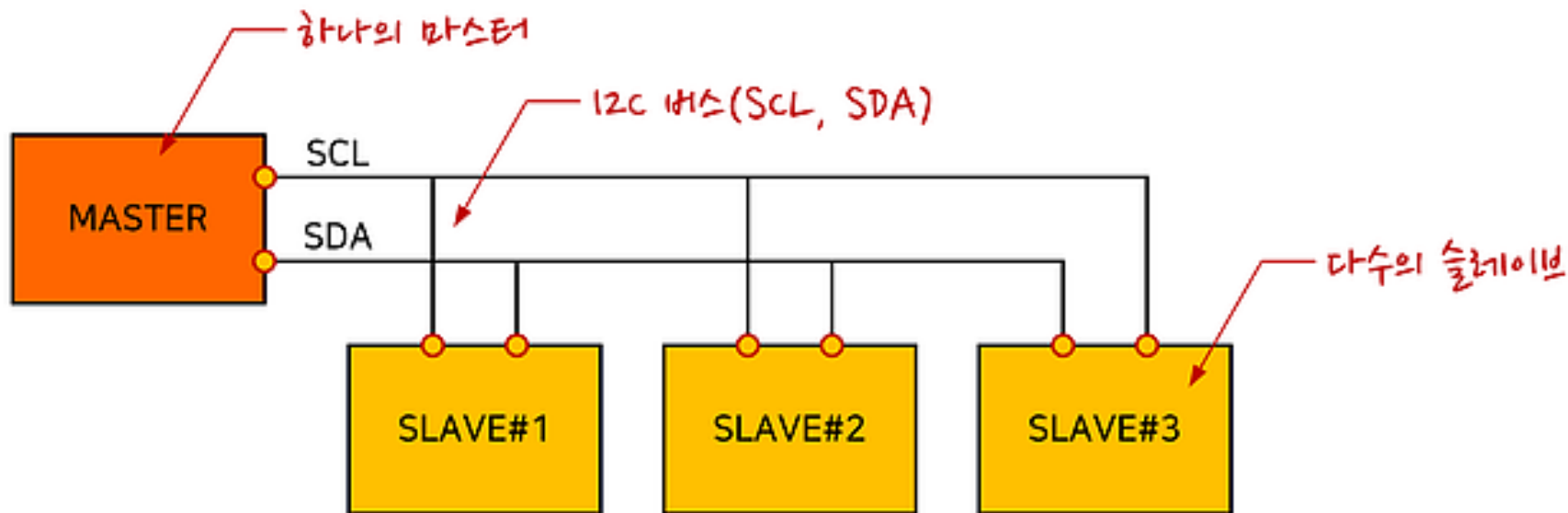
비접촉식 온도센서 실험

MLX90614

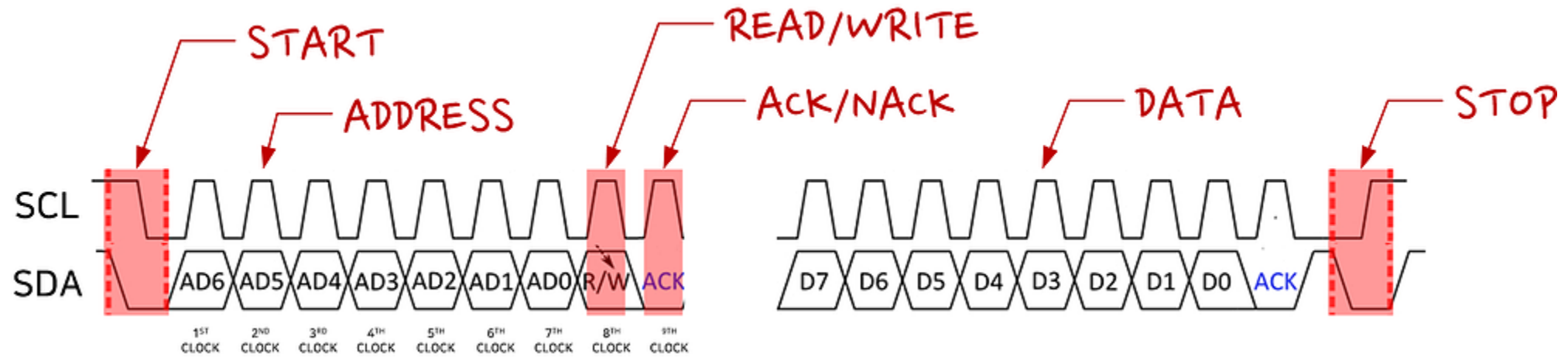
- 비접촉식 온도센서 모듈
- FOV 90°
- 측정범위 : -70°C ~ 380°C
- 인터페이스 : I2C



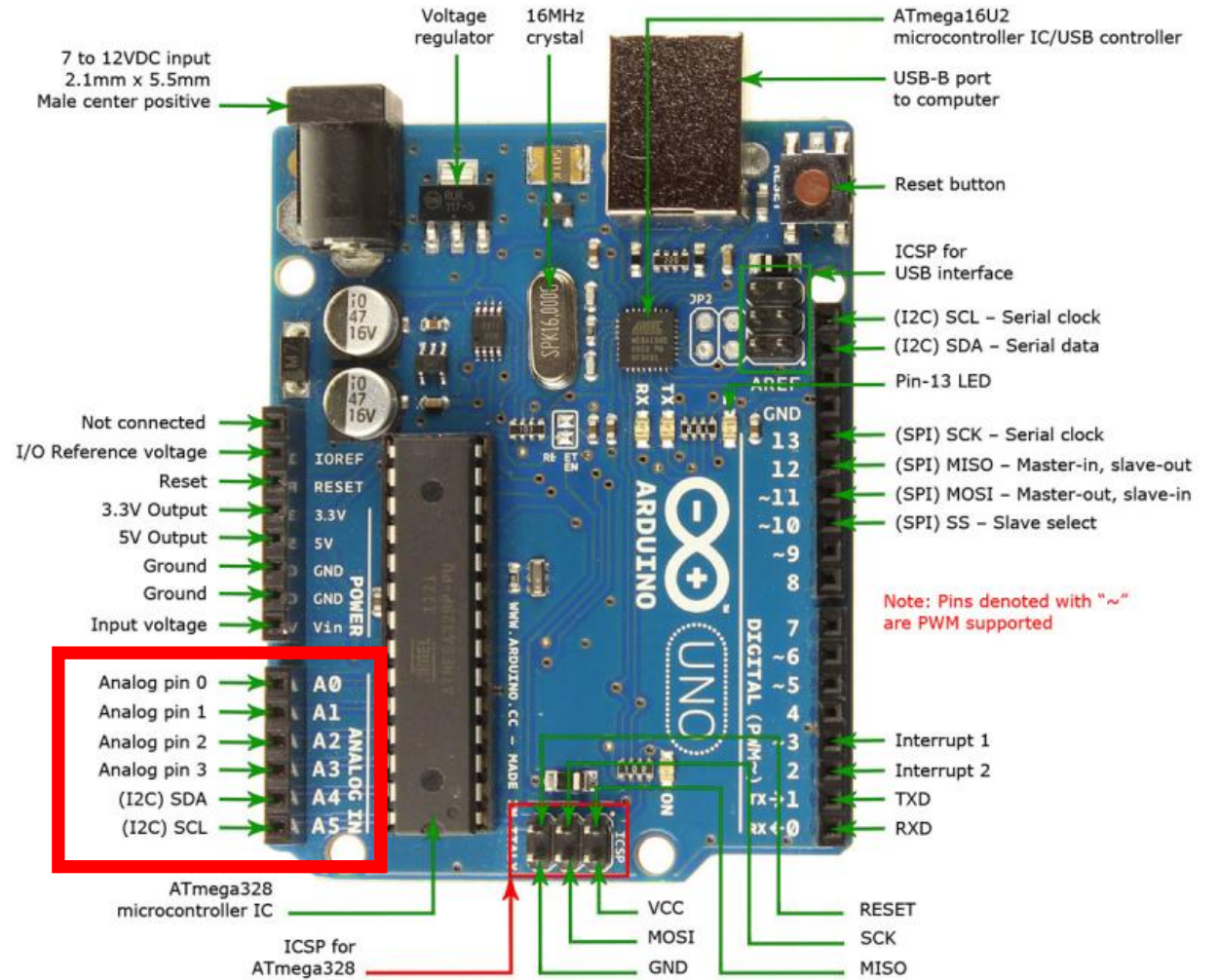
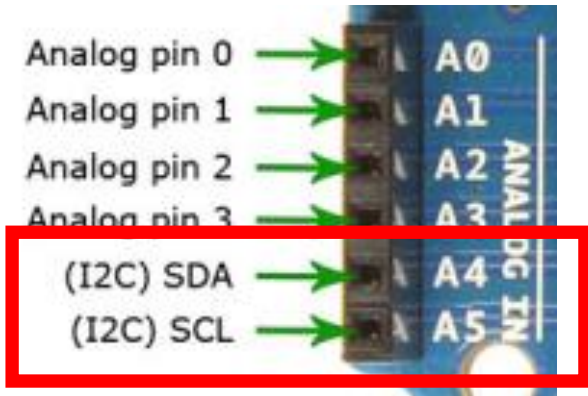
I2C 통신



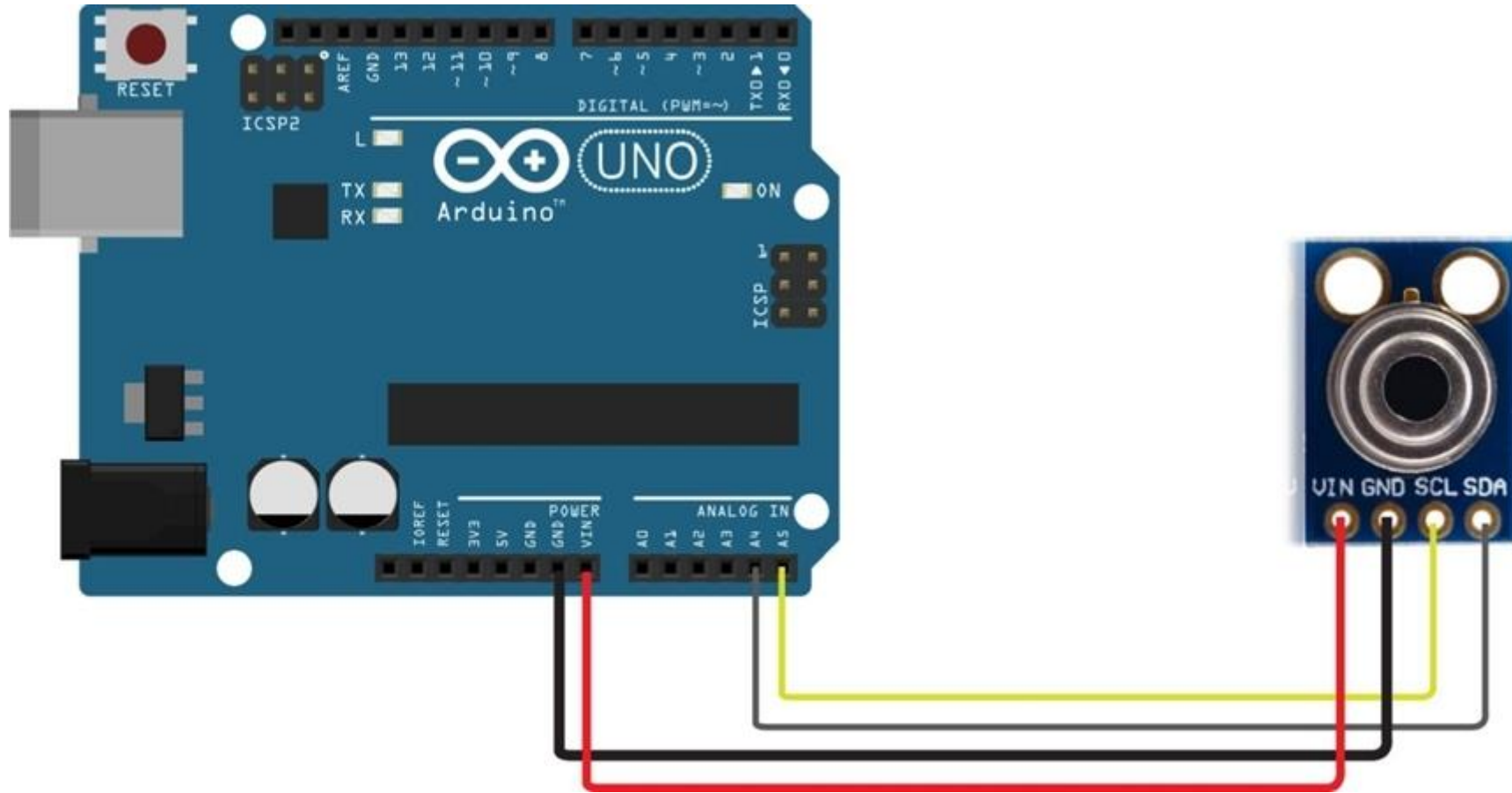
I2C 통신



아두이노의 I2C통신

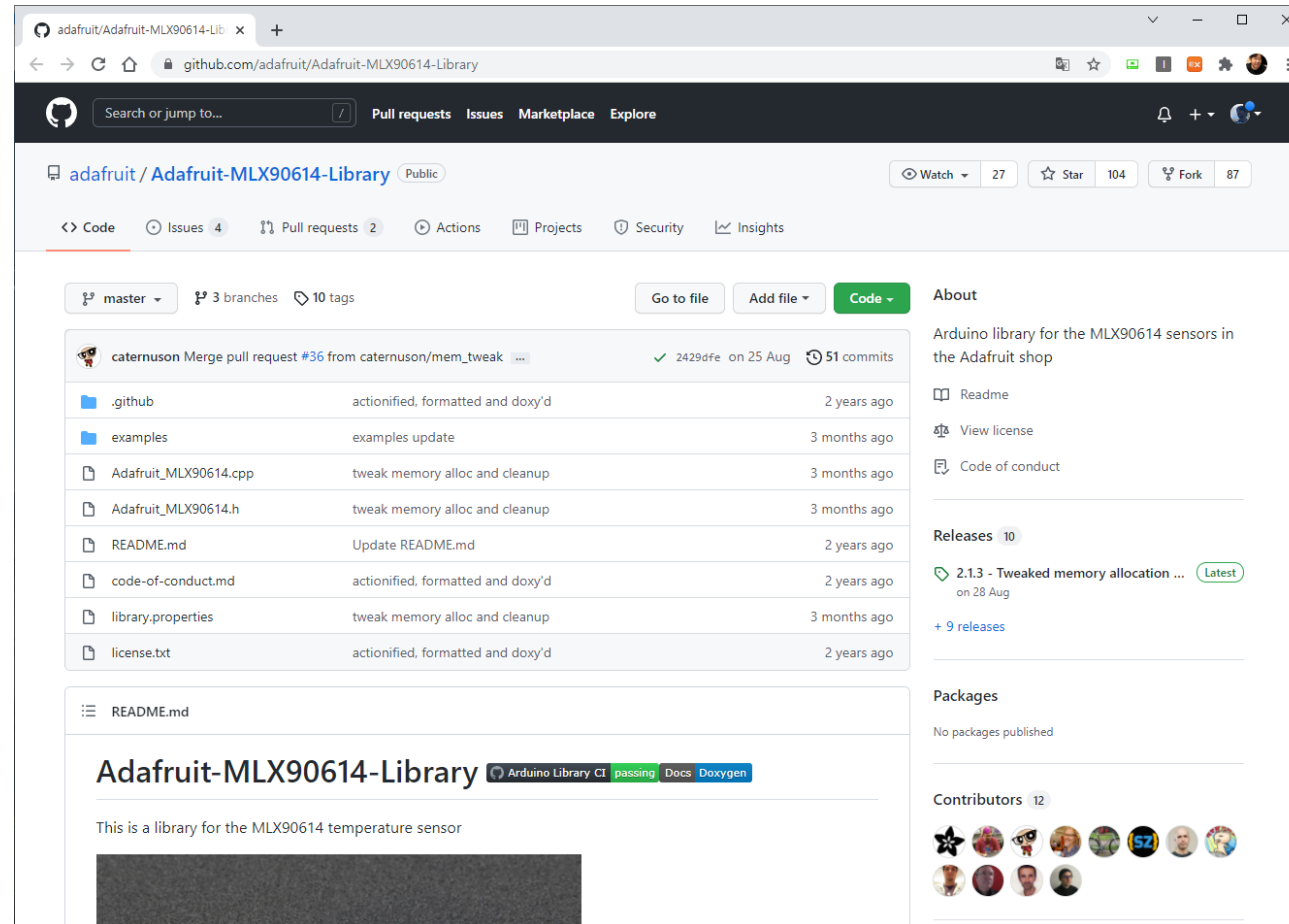


MLX90614 테스트



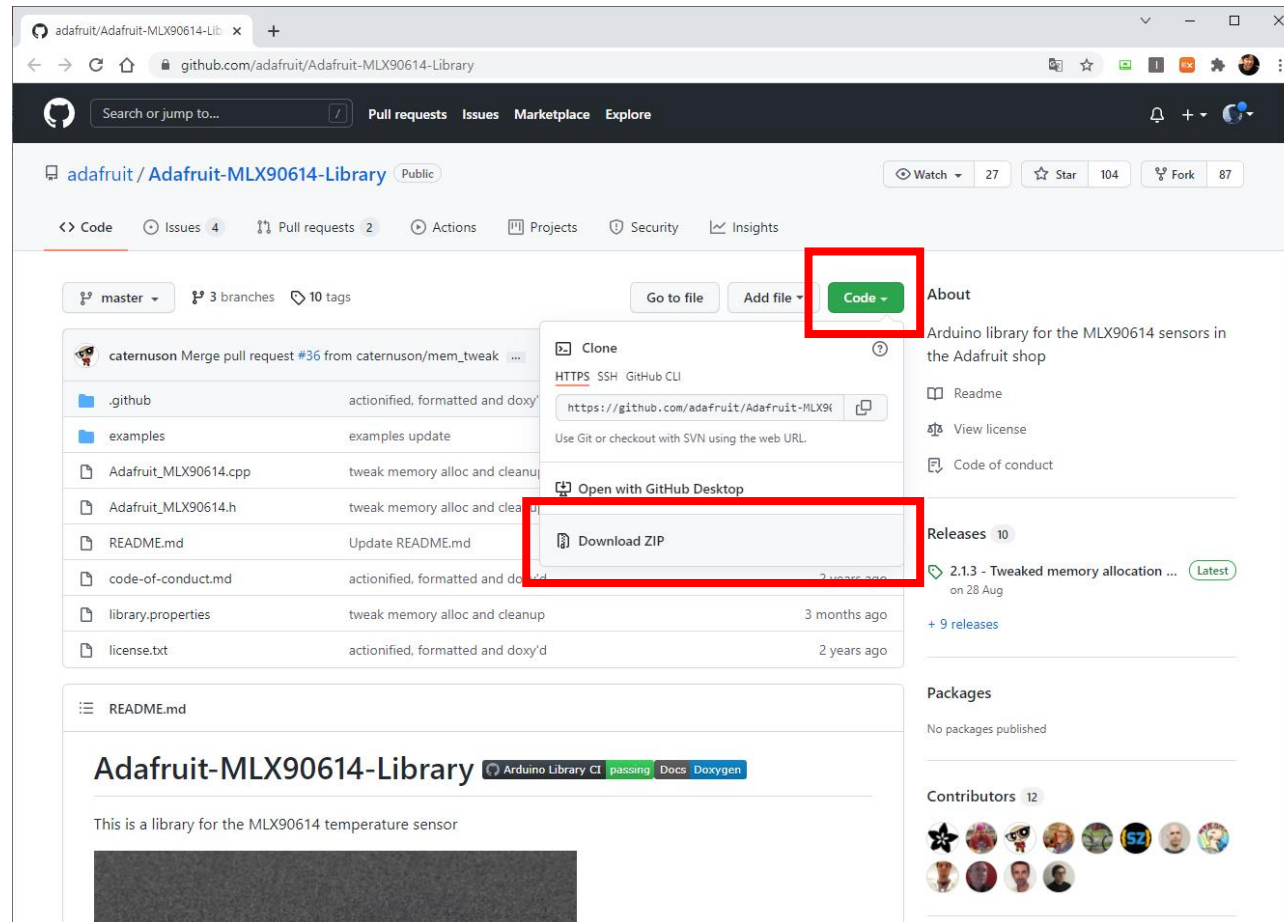
MLX90614 라이브러리 사용

- <https://github.com/adafruit/Adafruit-MLX90614-Library>

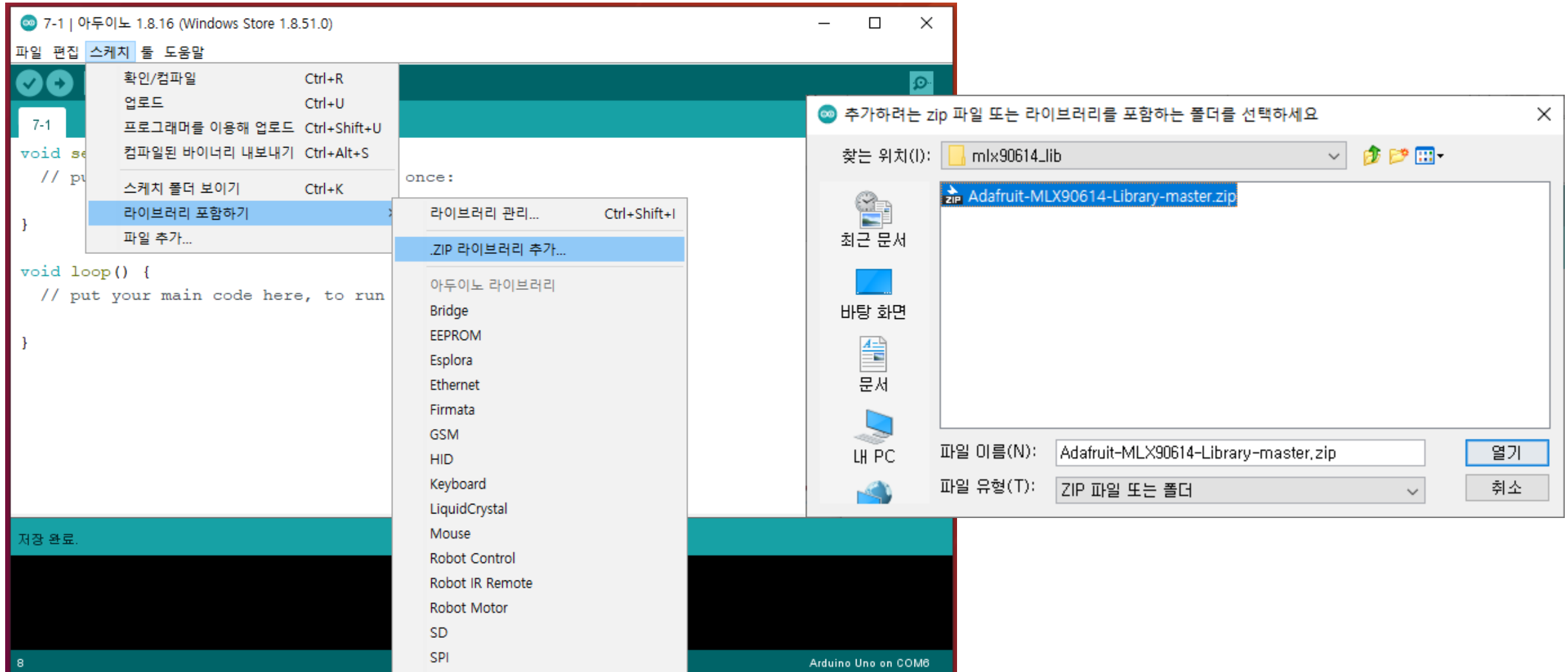


MLX90614 라이브러리 사용

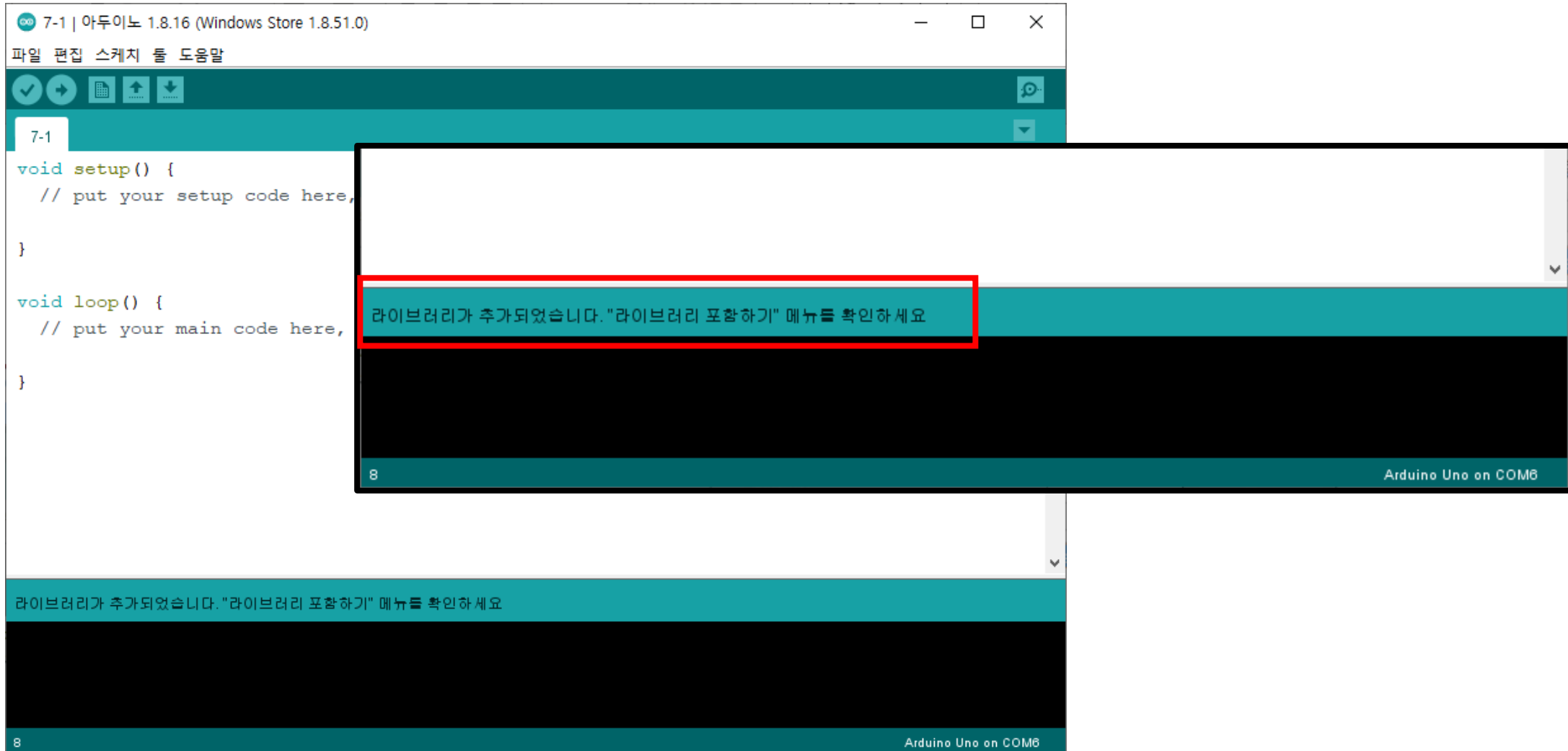
- <https://github.com/adafruit/Adafruit-MLX90614-Library>



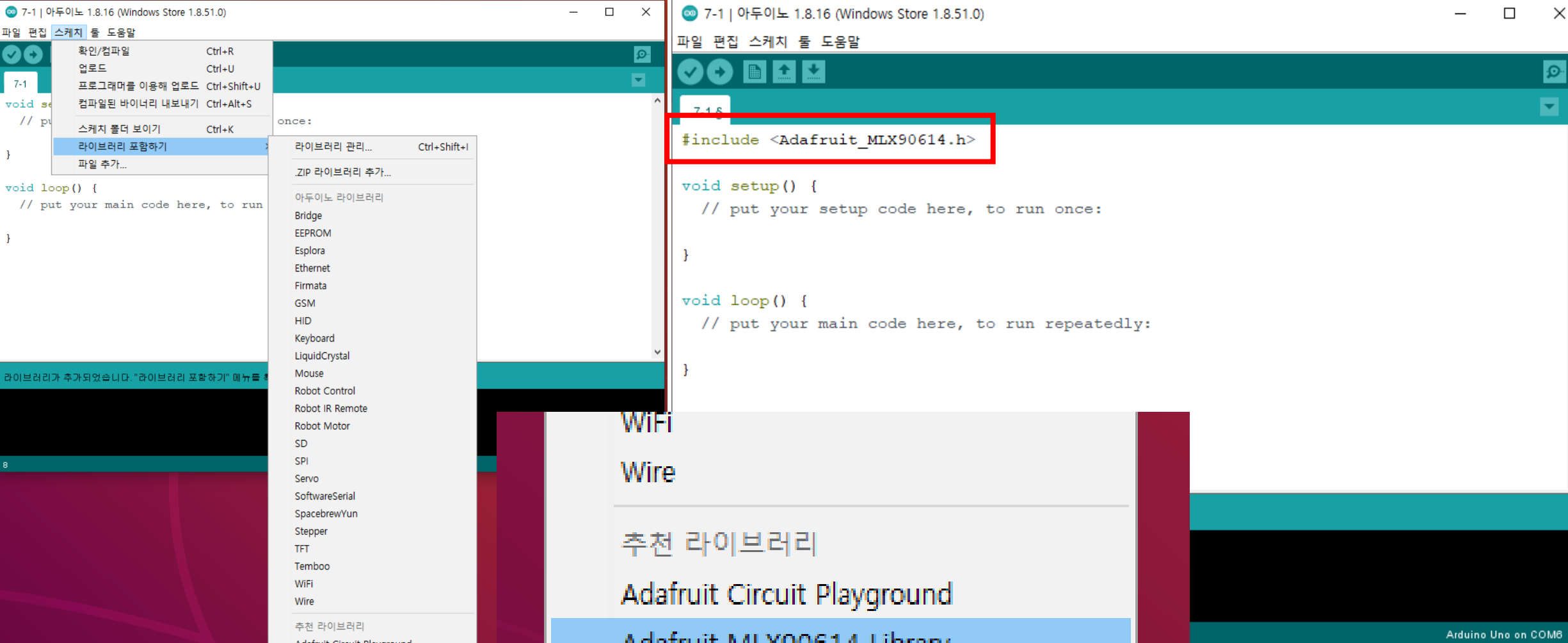
MLX90614 라이브러리 사용



MLX90614 라이브러리 사용



MLX90614 라이브러리 사용



7-1 | 아두이노 1.8.16 (Windows Store 1.8.51.0)

파일 편집 스케치 툴 도움말

확인/컴파일 Ctrl+R
업로드 Ctrl+U
프로그래머를 이용해 업로드 Ctrl+Shift+U
컴파일된 바이너리 내보내기 Ctrl+Alt+S
스케치 폴더 보기 Ctrl+K
라이브러리 포함하기
파일 추가...

라이브러리 관리... Ctrl+Shift+I

.ZIP 라이브러리 추가...

아두이노 라이브러리

Bridge
EEPROM
Esplora
Ethernet
Firmata
GSM
HID
Keyboard
LiquidCrystal
Mouse
Robot Control
Robot IR Remote
Robot Motor
SD
SPI
Servo
SoftwareSerial
SpacebrewYun
Stepper
TFT
Temboo
WiFi
Wire

추천 라이브러리

Adafruit Circuit Playground
Adafruit MLX90614 Library

7-1 | 아두이노 1.8.16 (Windows Store 1.8.51.0)

파일 편집 스케치 툴 도움말

7-16

#include <Adafruit_MLX90614.h>

void setup() {
 // put your setup code here, to run once:
}

void loop() {
 // put your main code here, to run repeatedly:
}

WiFi
Wire

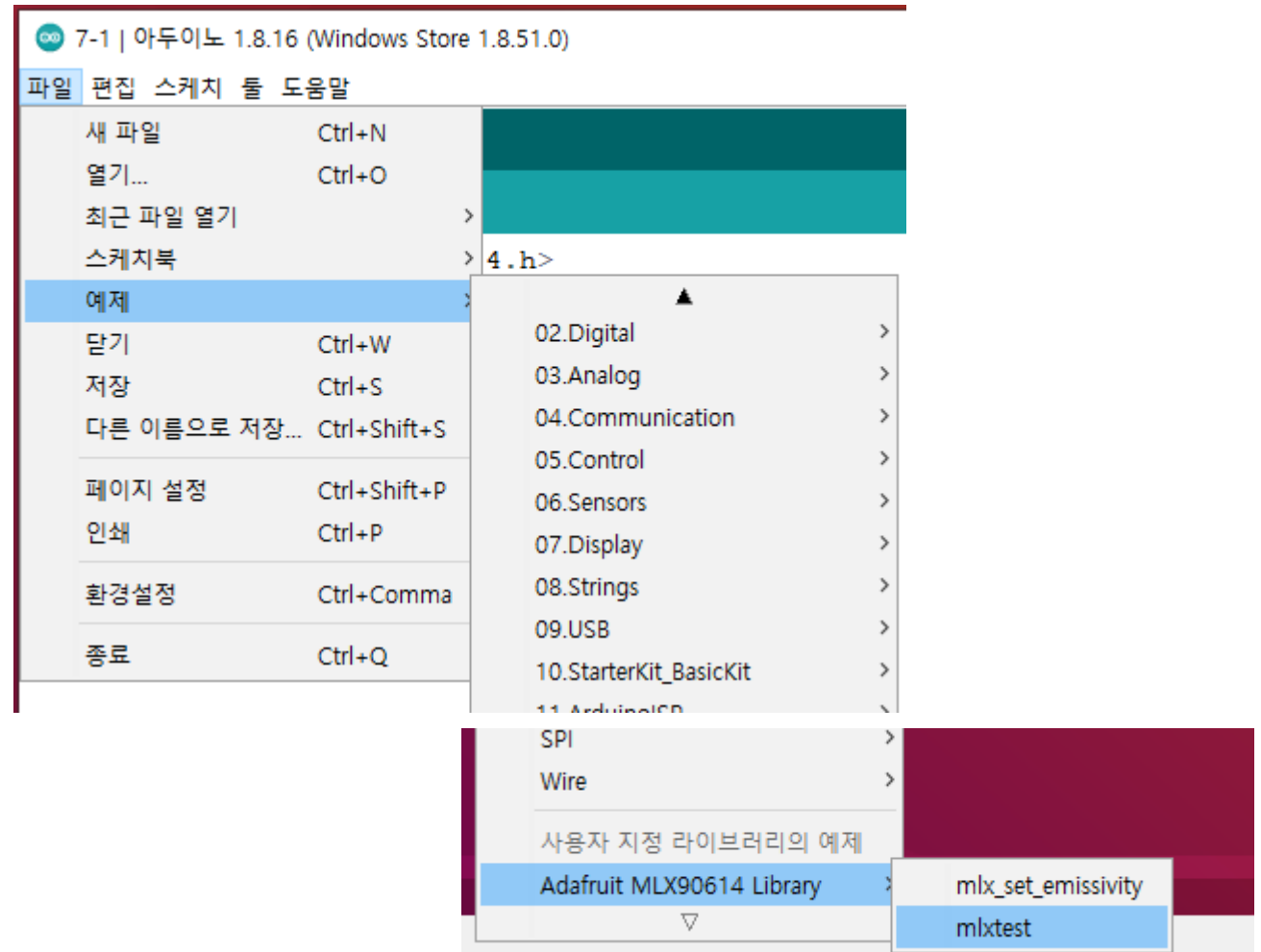
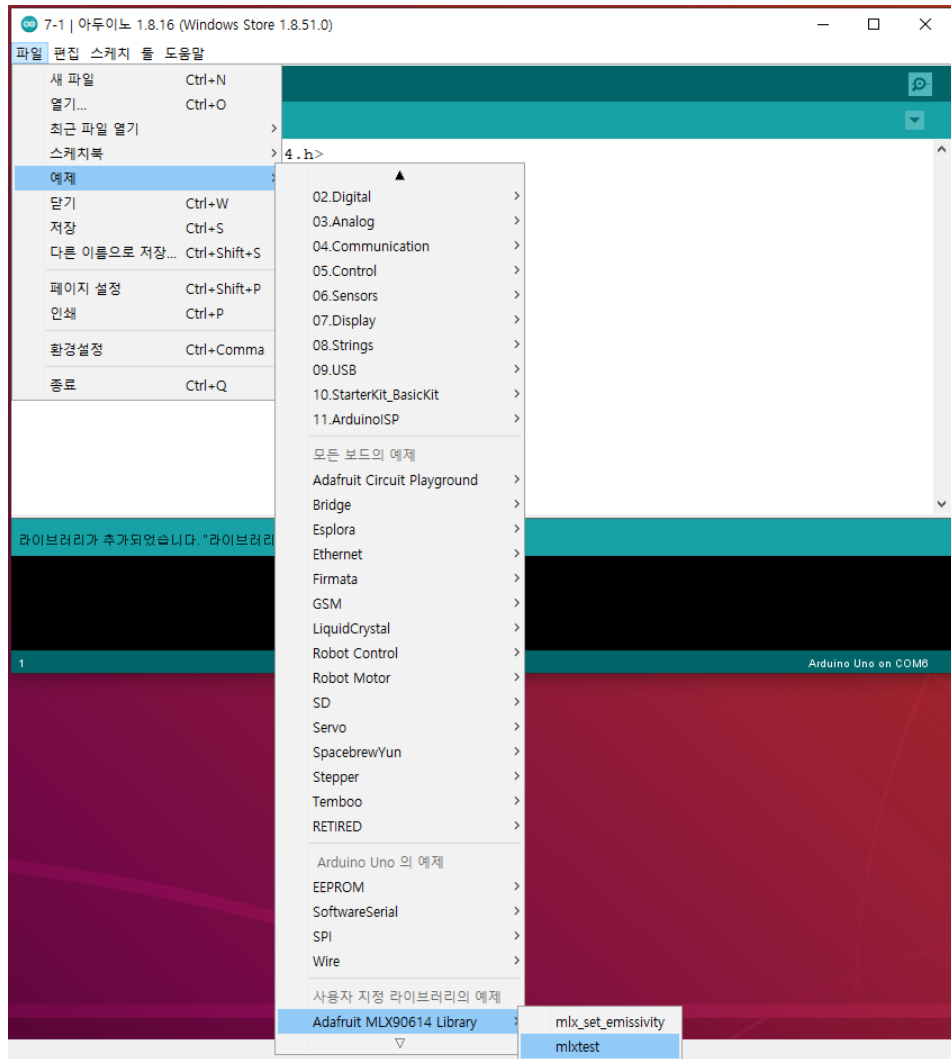
추천 라이브러리

Adafruit Circuit Playground

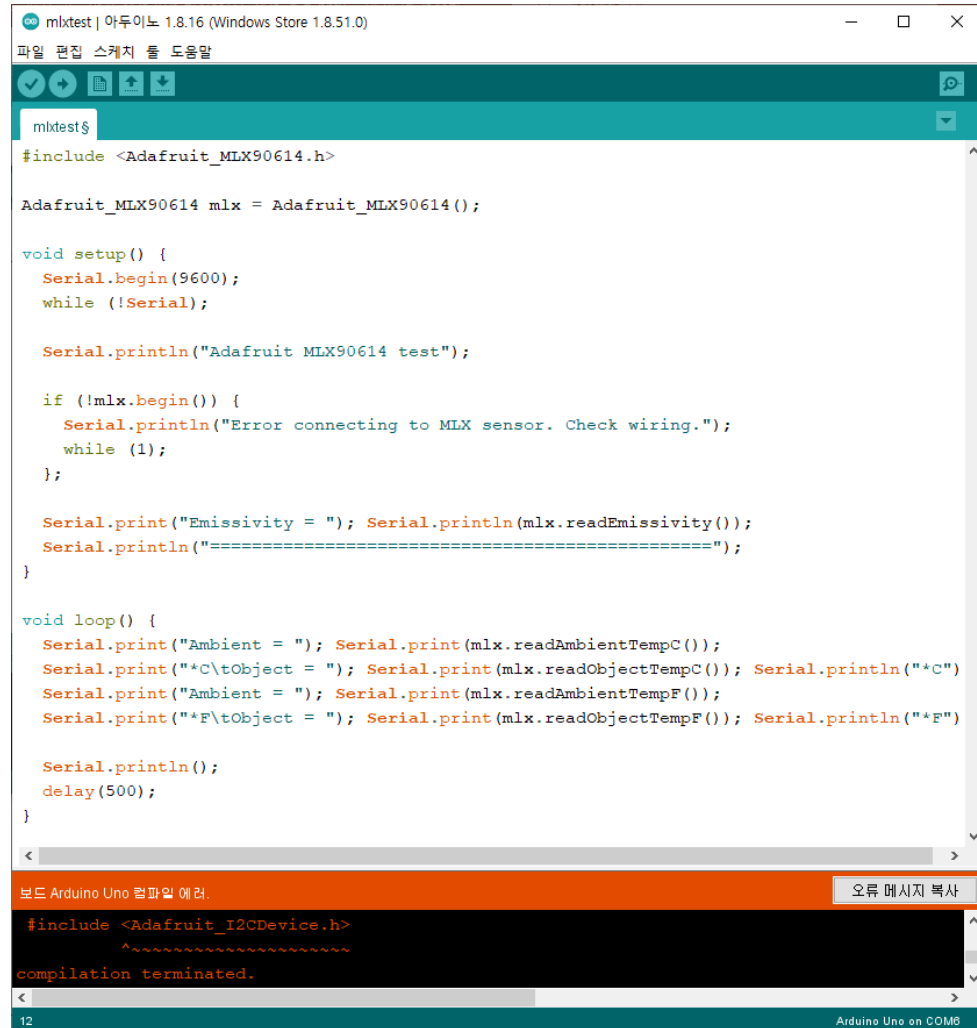
Adafruit MLX90614 Library

Arduino Uno on COM8

MLX90614 라이브러리 예제 테스트



MLX90614 라이브러리 예제 테스트



```
mlxtest | 아두이노 1.8.16 (Windows Store 1.8.51.0)
파일 편집 스케치 툴 도움말
mlxtest$
#include <Adafruit_MLX90614.h>

Adafruit_MLX90614 mlx = Adafruit_MLX90614();

void setup() {
  Serial.begin(9600);
  while (!Serial);

  Serial.println("Adafruit MLX90614 test");

  if (!mlx.begin()) {
    Serial.println("Error connecting to MLX sensor. Check wiring.");
    while (1);
  };

  Serial.print("Emissivity = "); Serial.println(mlx.readEmissivity());
  Serial.println("=====");
}

void loop() {
  Serial.print("Ambient = "); Serial.print(mlx.readAmbientTempC());
  Serial.print("C\tObject = "); Serial.print(mlx.readObjectTempC()); Serial.println("C");
  Serial.print("Ambient = "); Serial.print(mlx.readAmbientTempF());
  Serial.print("F\tObject = "); Serial.print(mlx.readObjectTempF()); Serial.println("F");

  Serial.println();
  delay(500);
}
```

보드 Arduino Uno 컴파일 에러. 오류 메시지 복사

```
#include <Adafruit_I2CDevice.h>
^~~~~~
compilation terminated.
```

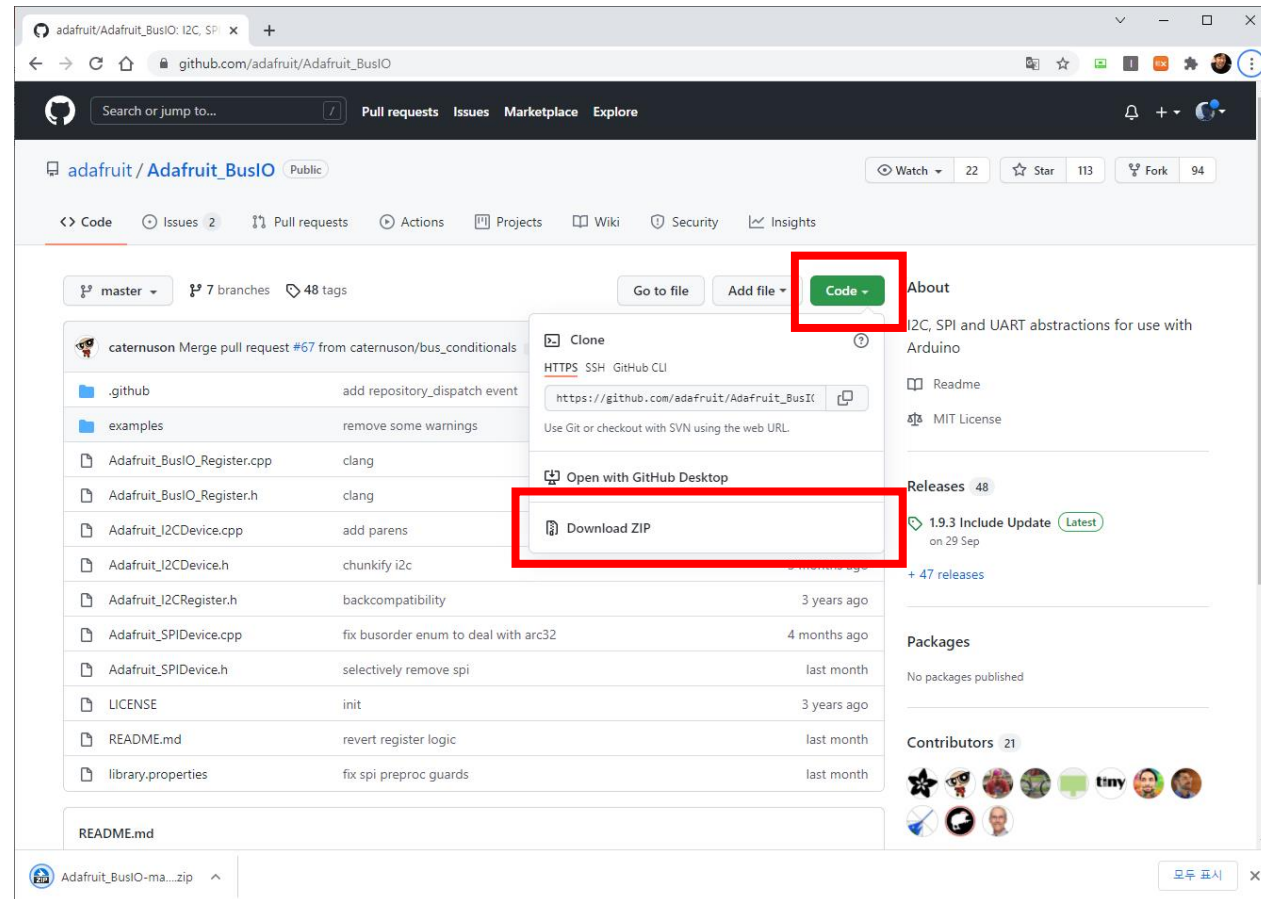
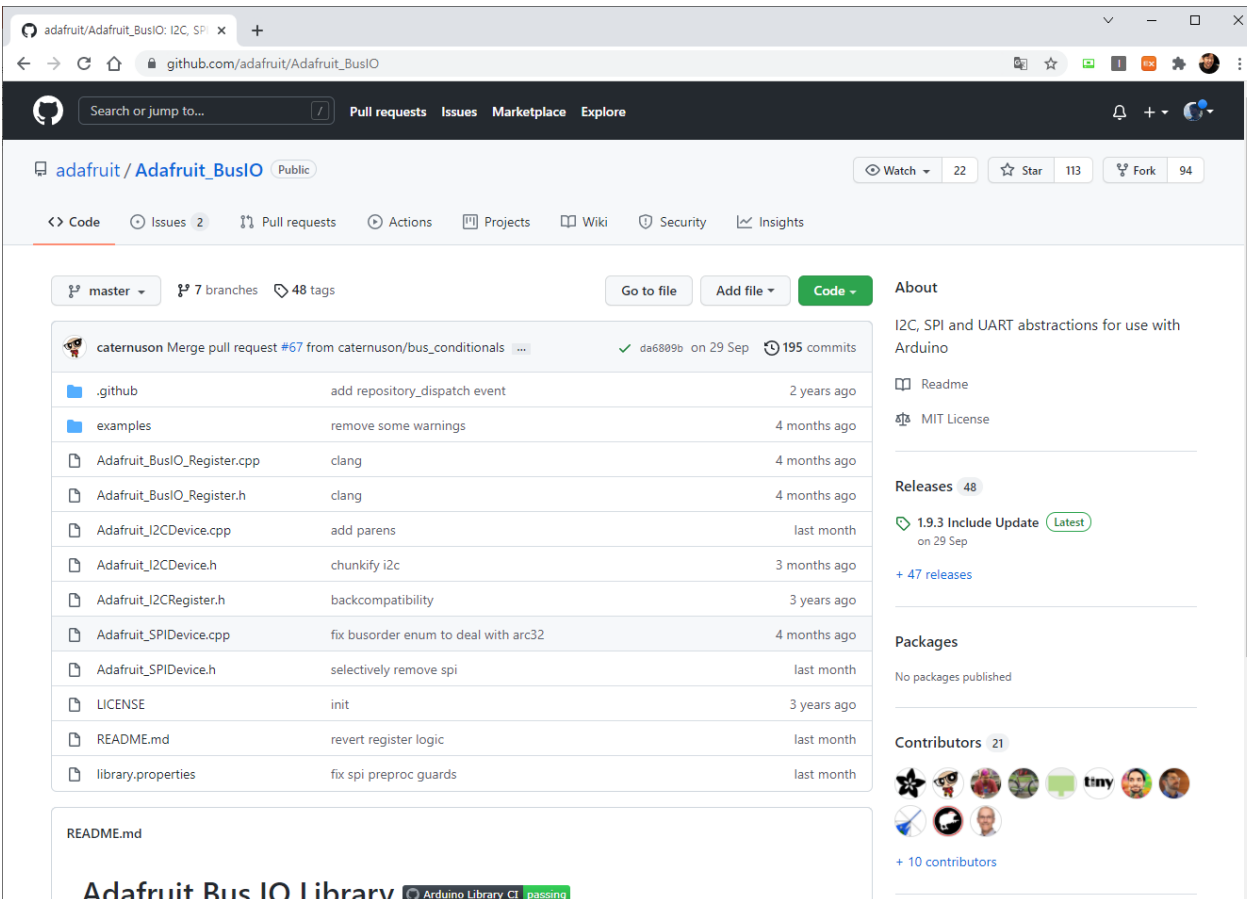
12 Arduino Uno on COM8

보드 Arduino Uno 컴파일 에러.

```
#include <Adafruit_I2CDevice.h>
^~~~~~
compilation terminated.
```

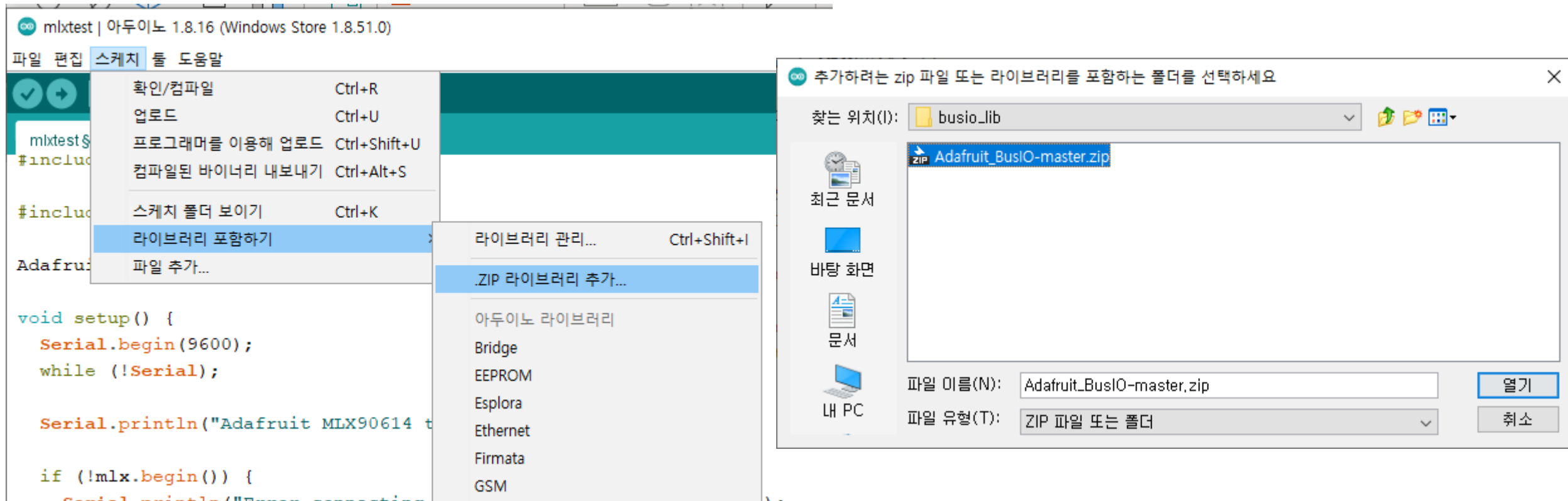
MLX90614 라이브러리 예제 테스트

- https://github.com/adafruit/Adafruit_BusIO 라이브러리 다운로드



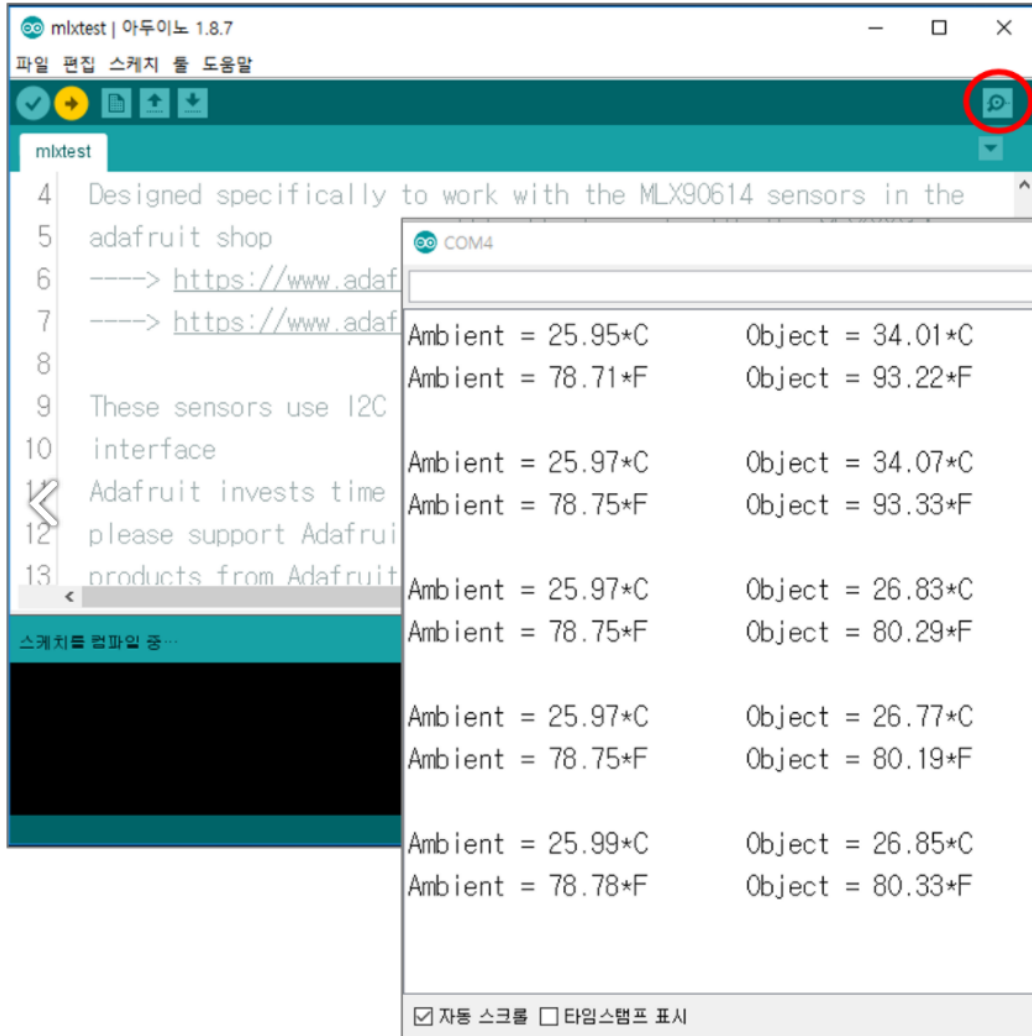
MLX90614 라이브러리 예제 테스트

- https://github.com/adafruit/Adafruit_BusIO 라이브러리 추가



MLX90614 라이브러리 예제 테스트

예제 7-1



The screenshot shows the Arduino IDE interface. The top window displays the 'mlxtest' sketch, which is a test program for the MLX90614 non-contact infrared thermometer. The code includes comments in Korean and C++ code that initializes the sensor and prints temperature readings. The serial monitor window, titled 'COM4', shows the output of the program, displaying ambient and object temperatures in both Celsius and Fahrenheit. The output is as follows:

Ambient (C)	Object (C)	Ambient (F)	Object (F)
25.95	34.01	78.71	93.22
25.97	34.07	78.75	93.33
25.97	26.83	78.75	80.29
25.97	26.77	78.75	80.19
25.99	26.85	78.78	80.33



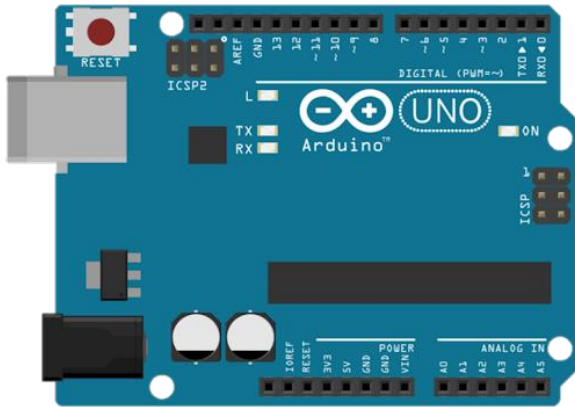
응용 : 체온 측정 출입 관리

전체 구성

손(물체) 유무 감지
(예제 6-1)



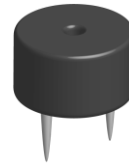
온도 측정
(예제 7-1)



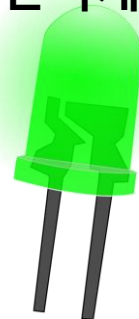
정보 출력(시리얼통신)



측정 완료 경고음 발생



LED 인디케이터

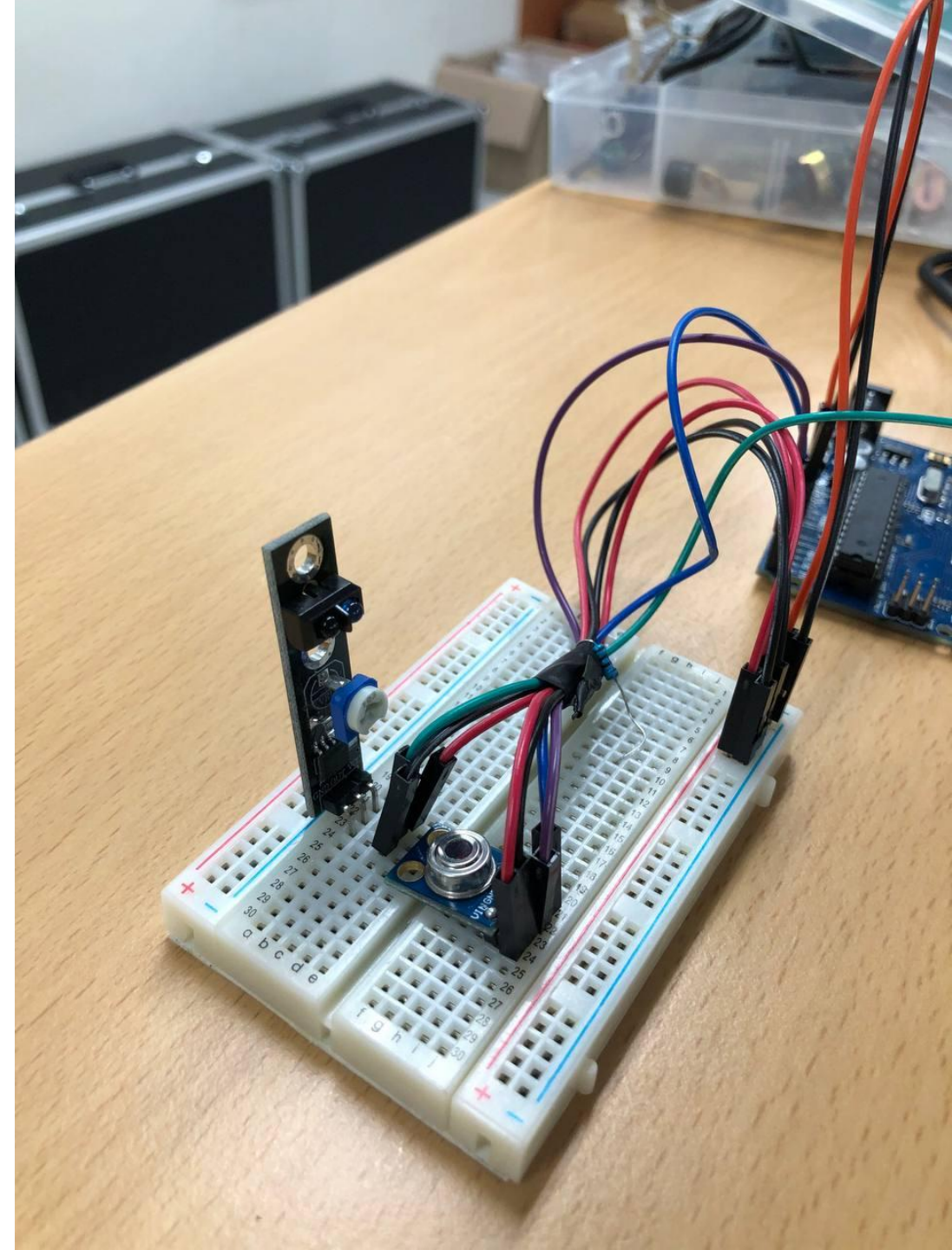


물체감지 + 온도체크

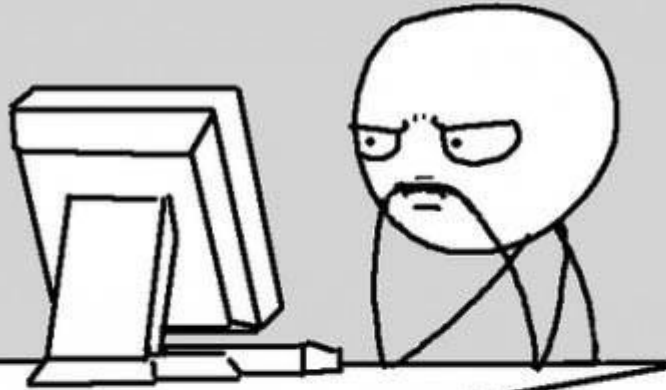
- 물체감지 체크 : 아두이노 5번핀



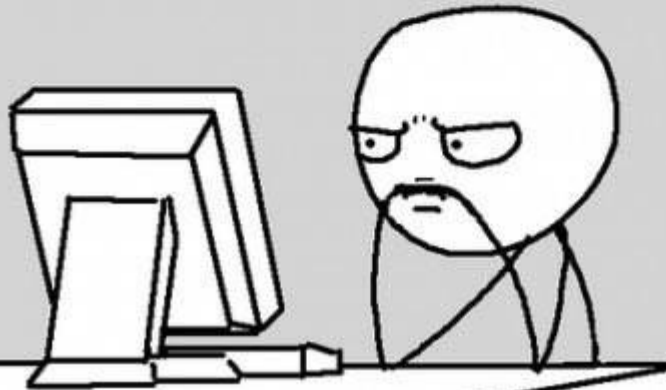
- 온도체크



It doesn't work..... why?



It works..... why?



순서도

