



WIZnet Academy 2017

아두이노(Arduino) 시작하기



WIZnet page

<http://wiznetacademy.com/>

<http://wiznet.io/>

<http://wizwiki.net>

아두이노란??

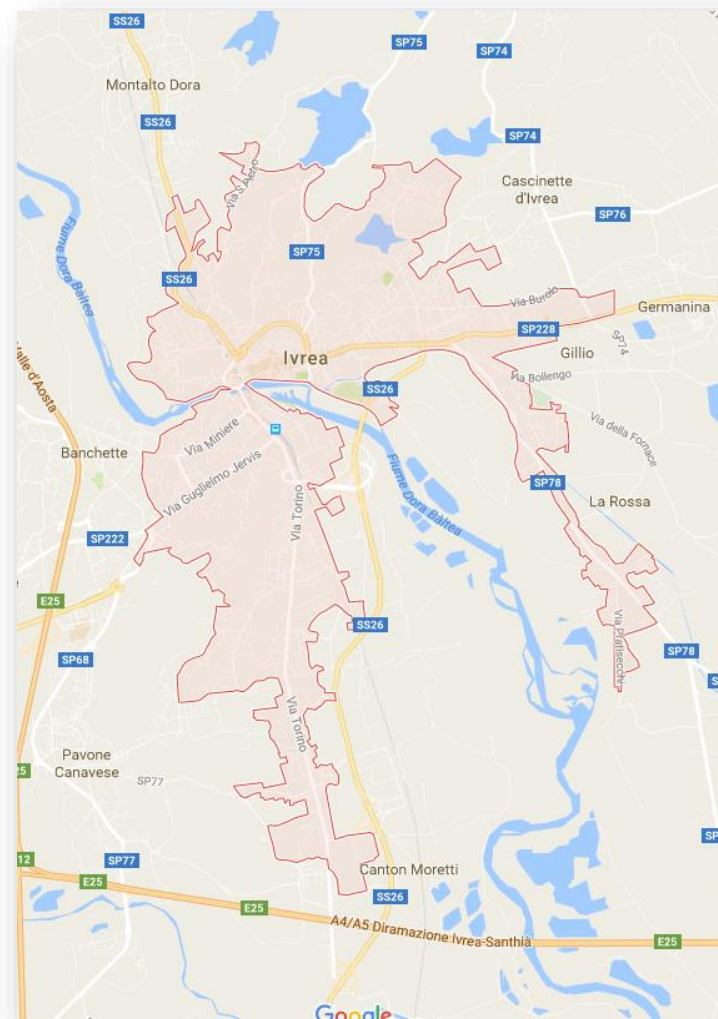
아두이노로 무엇을 할 수 있나요?

아두이노란?

» 탄생 배경

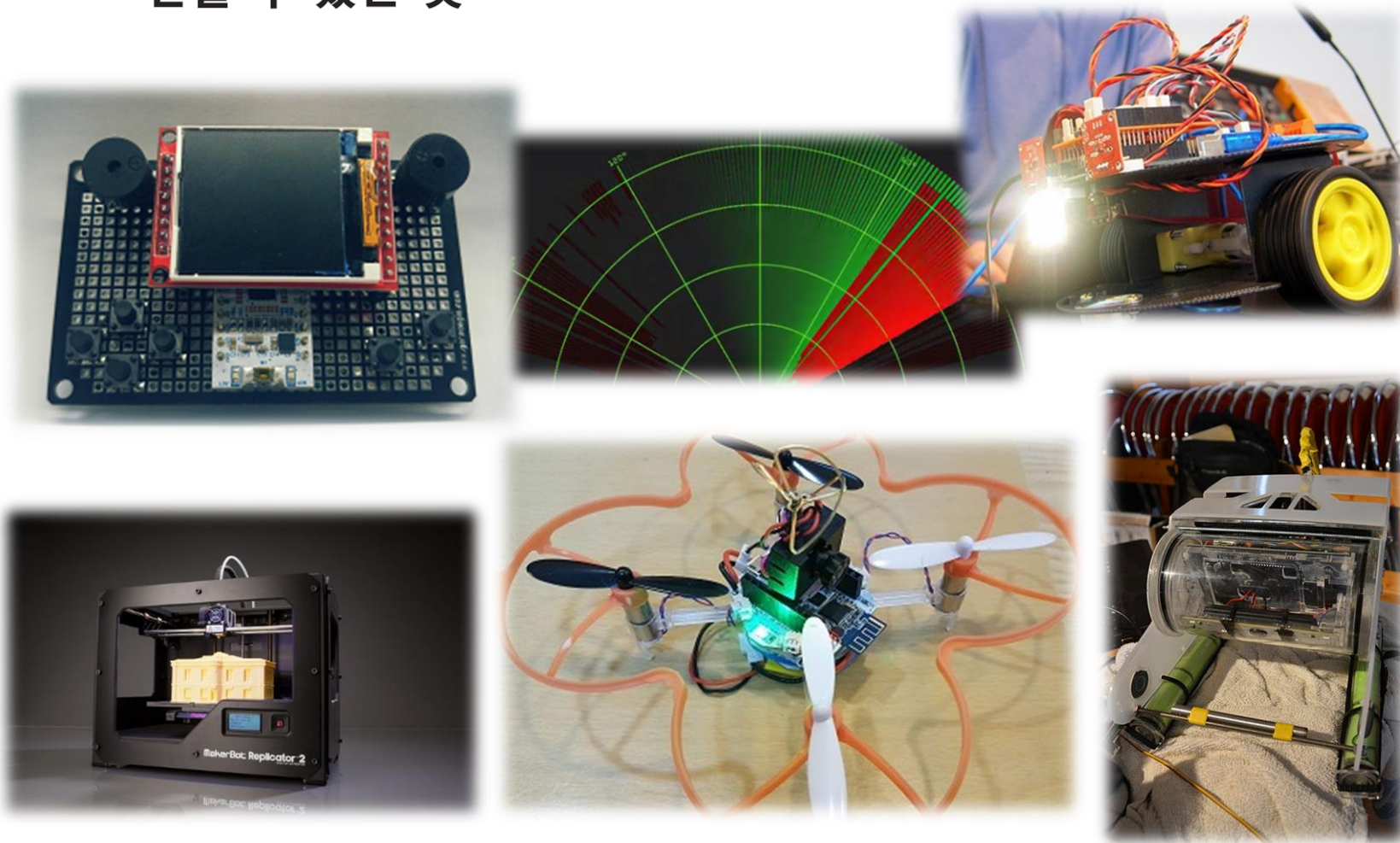
이탈리아어 Arduino
: 좋은 친구 (Strong Friend)

예술과 기술의 융합을
가르치는 대학의 교수가
공학을 잘 모르는 학생들을
위해 아두이노를 만듦



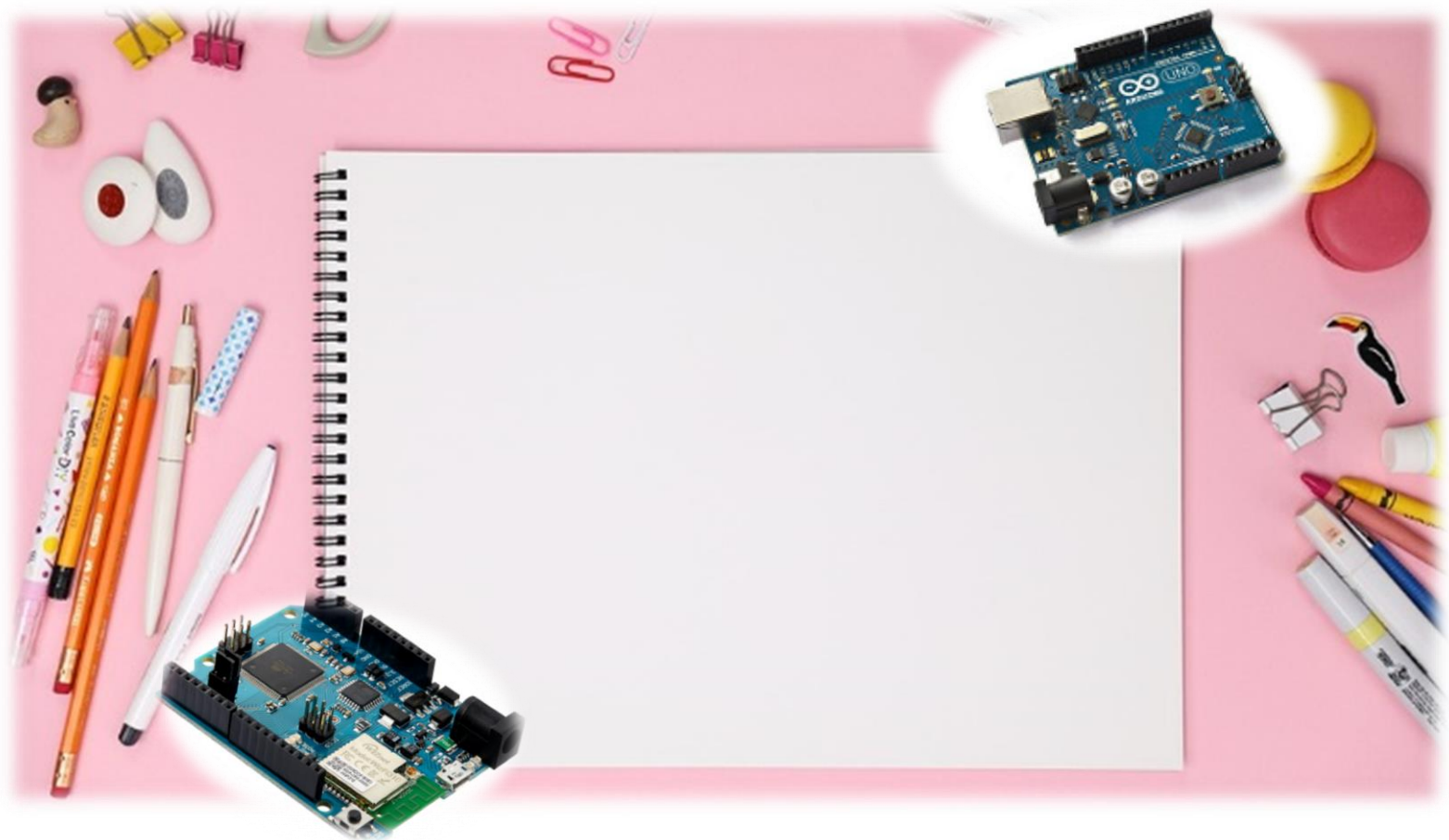
아두이노란?

» 만들 수 있는 것



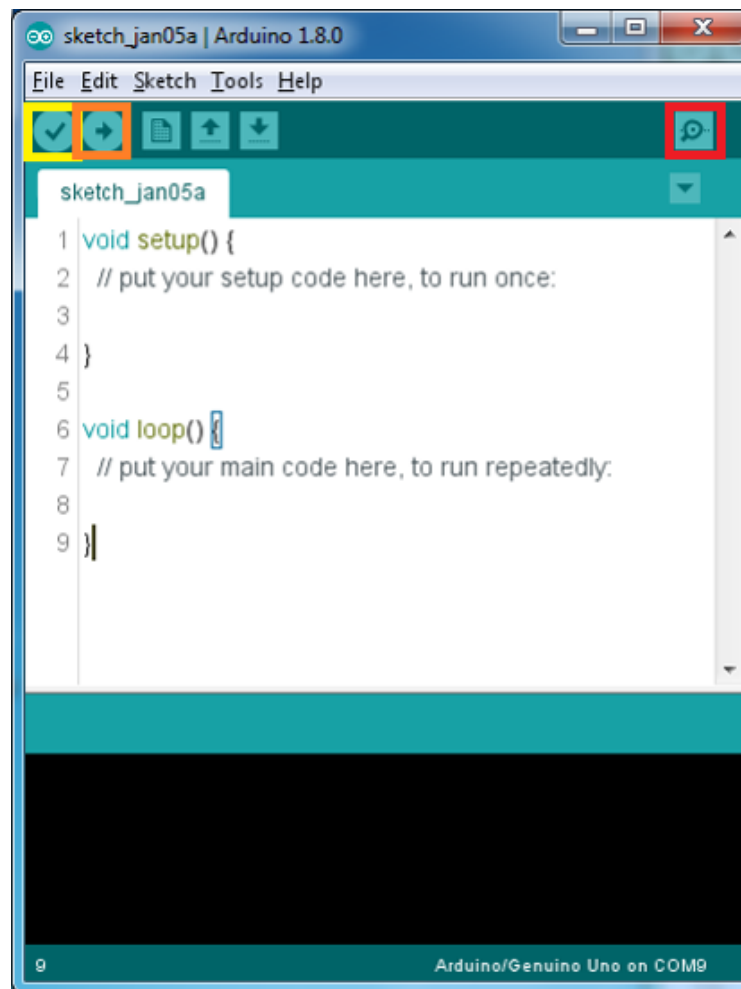
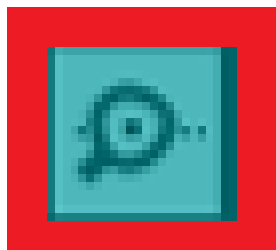
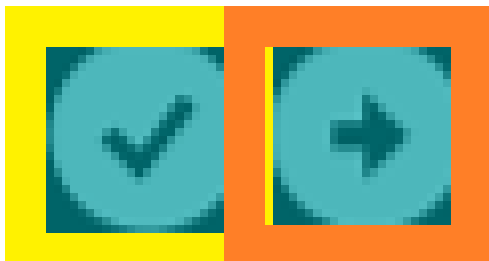
아두이노 둘러보기

» 스케치? 스케치북? 그리고 보드



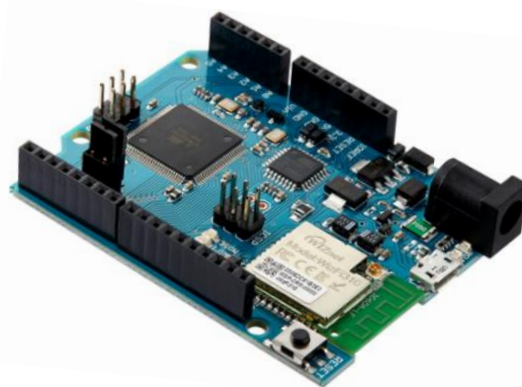
아두이노 둘러보기

»» 확인! 업로드! 관찰!
그리고 포트



아두이노 둘러보기

» 포트??? 올바른 길



출처 : [Wikimedia](#) (CC BY)

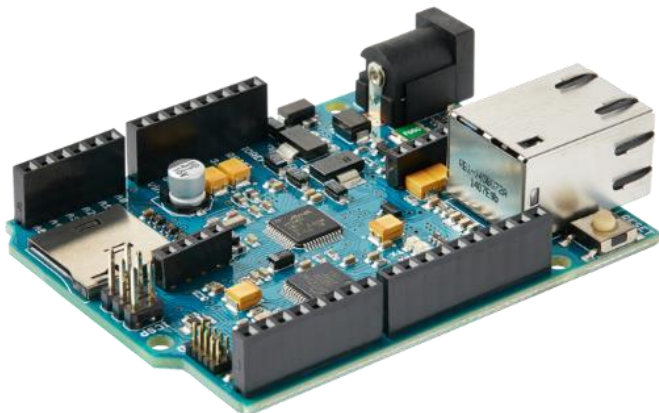
실습 구성 소개

구성 요소 및 하드웨어

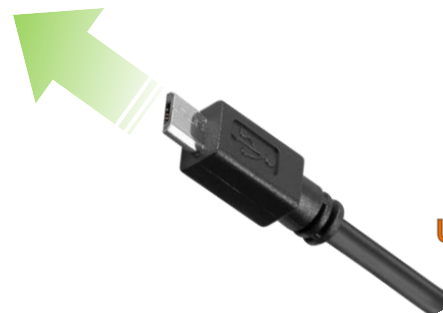
실습 소개: 하드웨어 구성

>> Stacking Arduino Shields

WIZnet WizArduino M0 ETH
(Arduino M0 + Ethernet)



YwRobot
Easy Module Shield V1

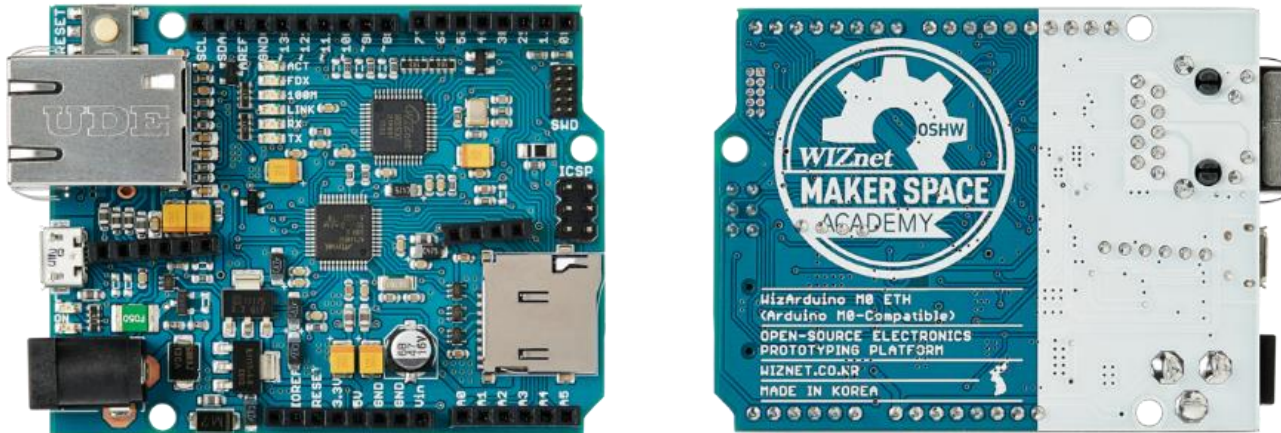


USB Micro-B Cable

실습 소개: 하드웨어 구성 (cont'd)

»» WizArduino M0 ETH

- ATSAMD21G18 MCU with a 32-bit ARM® Cortex™-M0+
 - Compatible with **Arduino M0** Board
(<https://www.arduino.cc/en/Main/ArduinoBoardUno>)
 - Up to 48MHz Clock Speed, 256KB Flash Memory, 32K SRAM
- W5500 TCP/IP Embedded Ethernet Controller

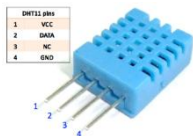


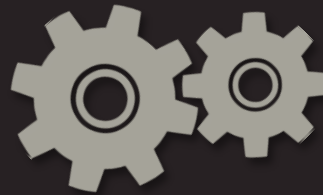
RGB LED Light Emitting Diode (Digital)

CDS Light Sensor (Analog)

DHT11

Temperature / Humidity Sensor (Digital)





실습 #1

개발 환경 구축

- Arduino IDE 설치
- 하드웨어 연결 및 확인

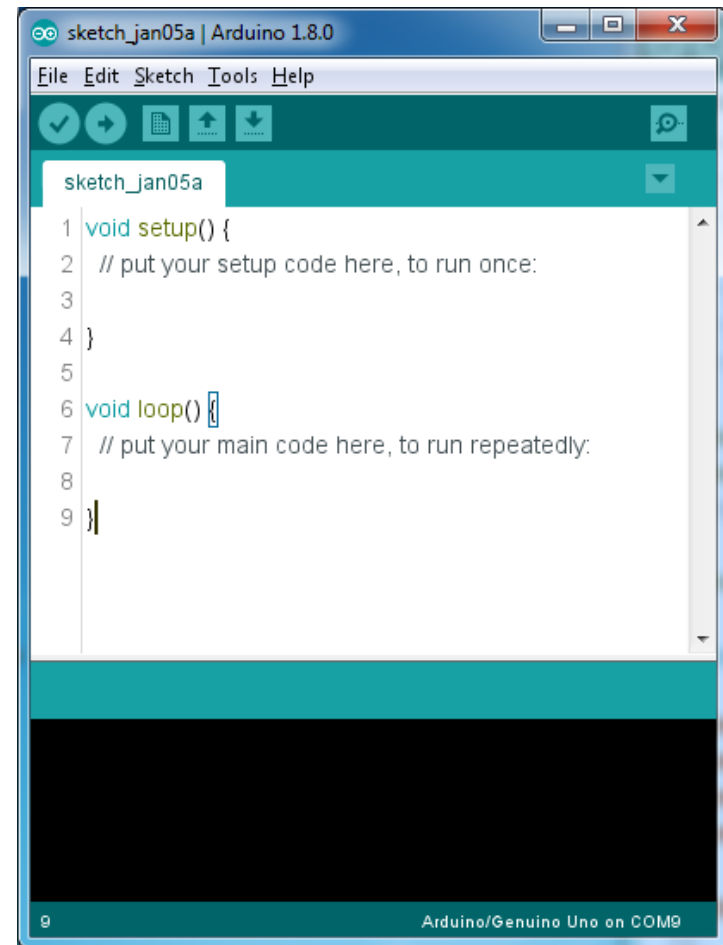
실습 #1: Arduino IDE 설치

>> Arduino IDE 설치 및 실행

- 다운받은 파일 실행
- 그대로 설치 진행
- 설치과정에서 나오는 모든 드라이버 설치



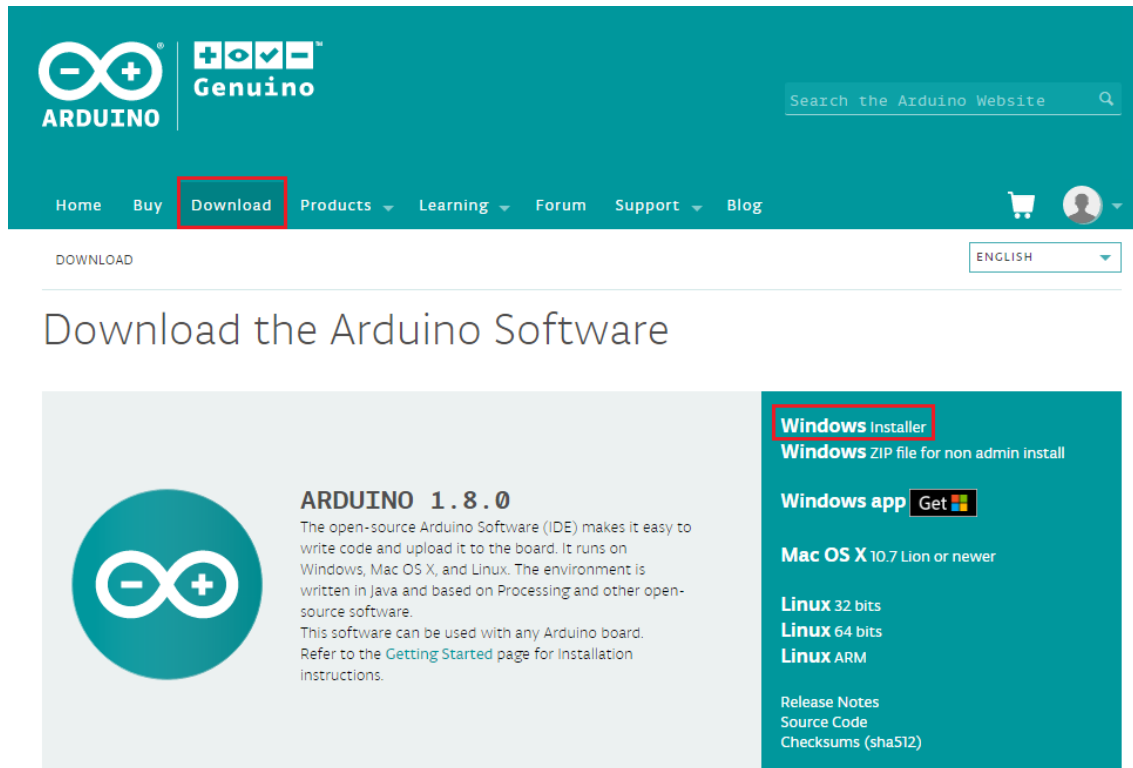
아두이노 메뉴의 기능이
궁금하다면 [클릭!](#)



실습 #1: Arduino IDE 설치

>> Arduino IDE 설치파일 다운받기

<https://www.arduino.cc/>



The screenshot shows the Arduino website's download page. The header features the Arduino and Genuino logos, a search bar, and navigation links: Home, Buy, Download (highlighted with a red box), Products, Learning, Forum, Support, and Blog. Below the header, the main heading is "Download the Arduino Software". On the left, there is a large Arduino logo and text describing the Arduino 1.8.0 IDE. On the right, there are links for downloading the software: "Windows installer" (highlighted with a red box), "Windows ZIP file for non admin install", "Windows app" (with a "Get" button), "Mac OS X 10.7 Lion or newer", "Linux 32 bits", "Linux 64 bits", and "Linux ARM". At the bottom right, there are links for "Release Notes", "Source Code", and "Checksums (sha512)".

ARDUINO 1.8.0

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software. This software can be used with any Arduino board. Refer to the [Getting Started](#) page for installation instructions.

Windows installer

Windows ZIP file for non admin install

Windows app [Get](#)

Mac OS X 10.7 Lion or newer

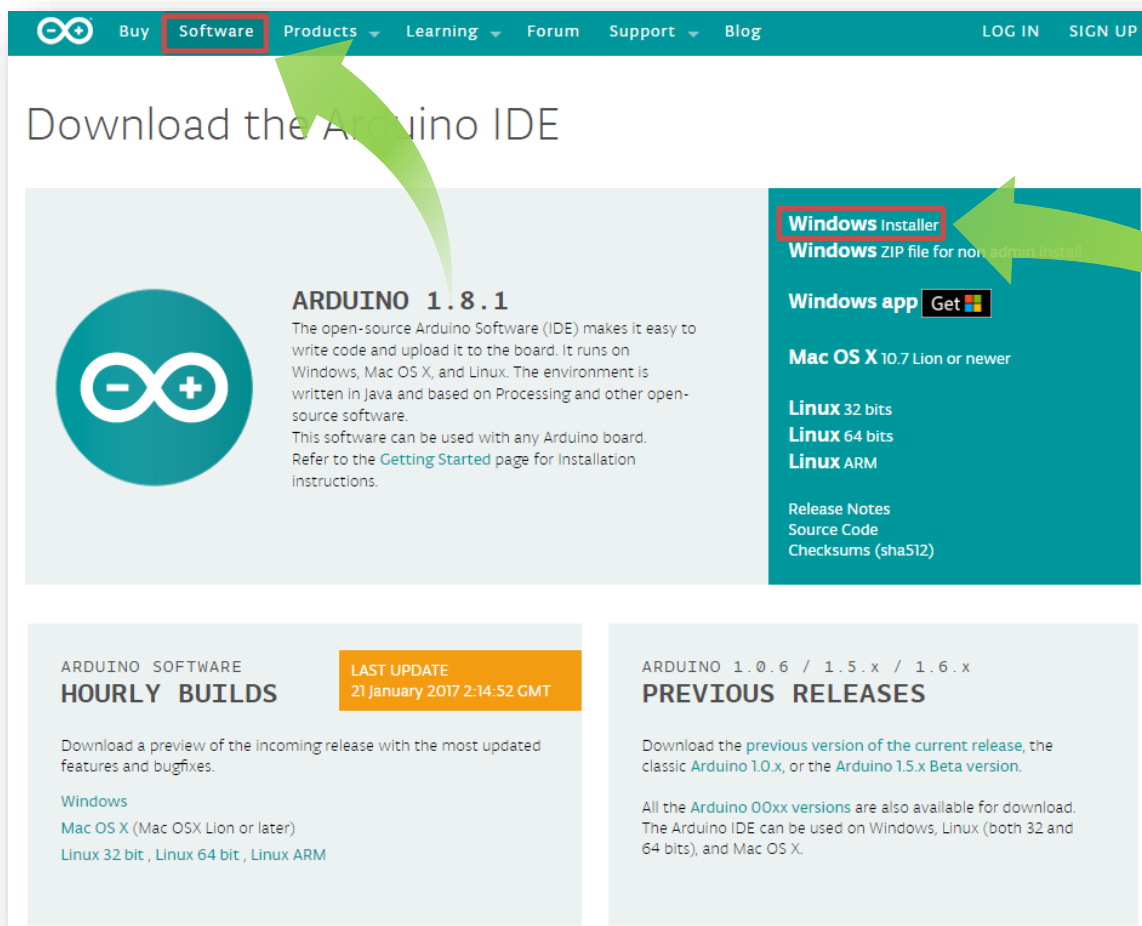
Linux 32 bits
Linux 64 bits
Linux ARM

Release Notes
Source Code
Checksums (sha512)

[궁금해요! <Arduino 분쟁 및 통합 관련 링크>](#)

실습 #1: Arduino IDE 설치

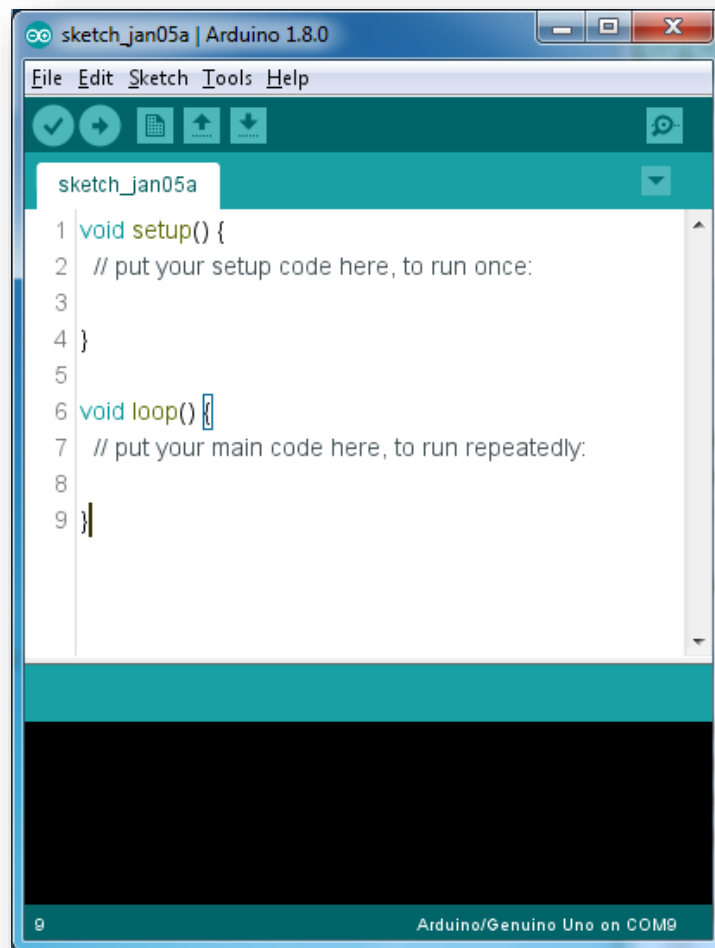
» Download the Arduino IDE www.arduino.cc



<https://www.arduino.cc/en/Main/Software>

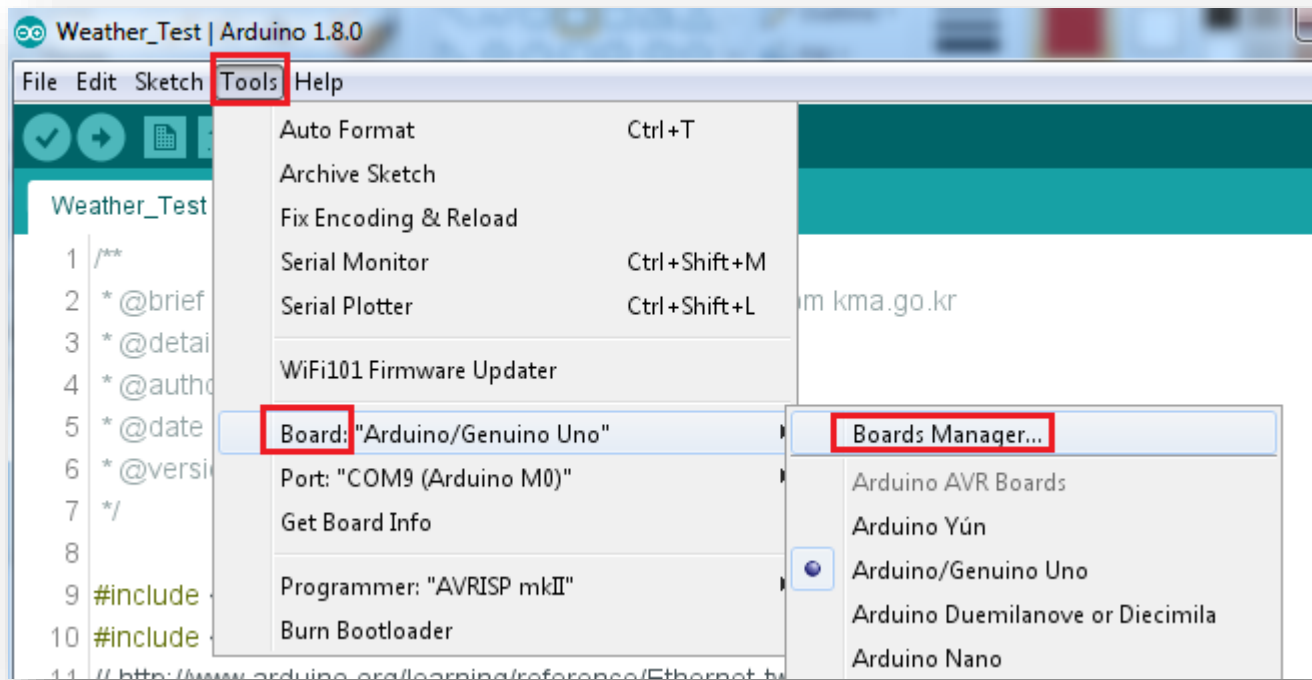
실습 #1: Arduino IDE 설치

>> Arduino IDE



실습 #1: 하드웨어 연결 및 확인

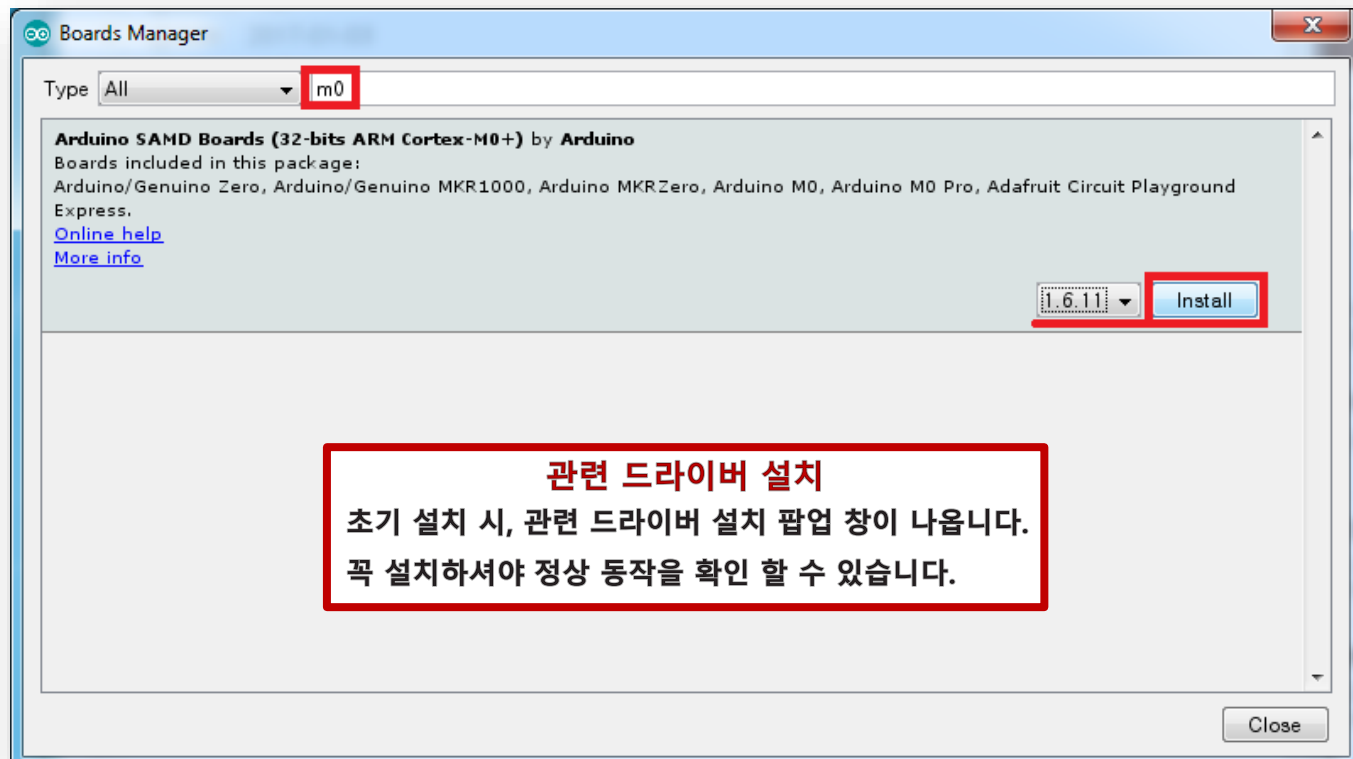
» Board Manager를 이용한 Board 추가



실습 #1: 하드웨어 연결 및 확인

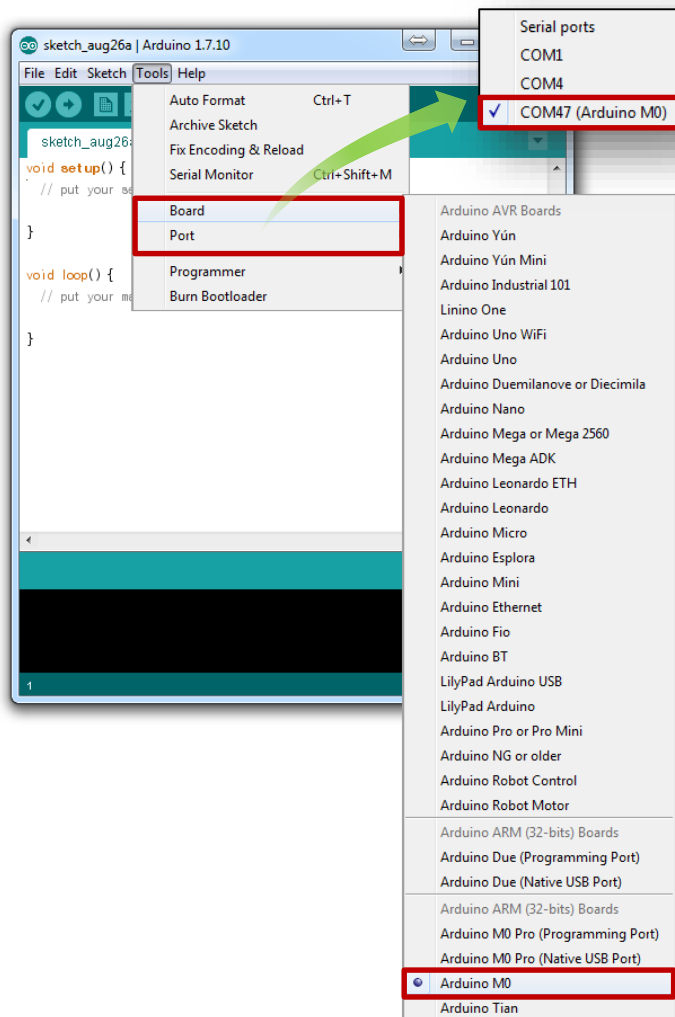
>> Board Manager를 이용한 Board 추가(cont'd)

- M0 입력 후, **Arduino SAMD Boards** Install 진행



실습 #1: 하드웨어 연결 및 확인

>> Arduino 연결 및 Board 선택



Arduino Board 선택 절차

1. 도구(Tools) -> Board
2. **Arduino M0** 선택
3. Board가 연결된 COM Port 확인

Driver 설치에 실패 할 경우

‘아두이노 기초 및 이더넷 시작하기’ 강의자료의
‘5. Arduino Driver 설치 에러 발생’ (p.42~) 참조

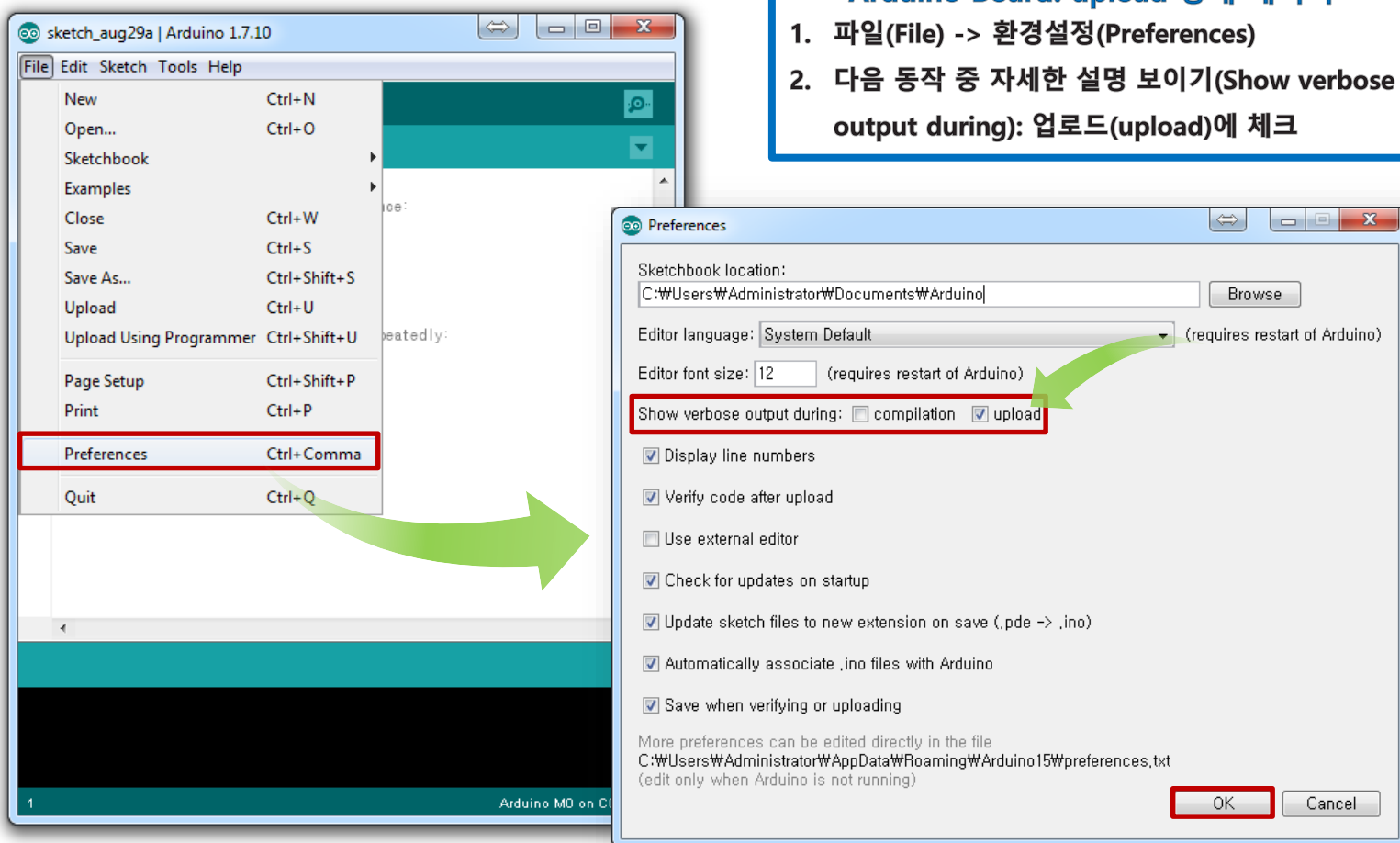
Link: <http://wiznetacademy.com/wp/wp-content/uploads/2016/07/Lecture Note Arduino Ethernet.pdf>

실습 #1: 개발 환경 구축

» Arduino IDE: Upload 상세 메시지 출력 설정

Arduino Board: upload 상세 메시지

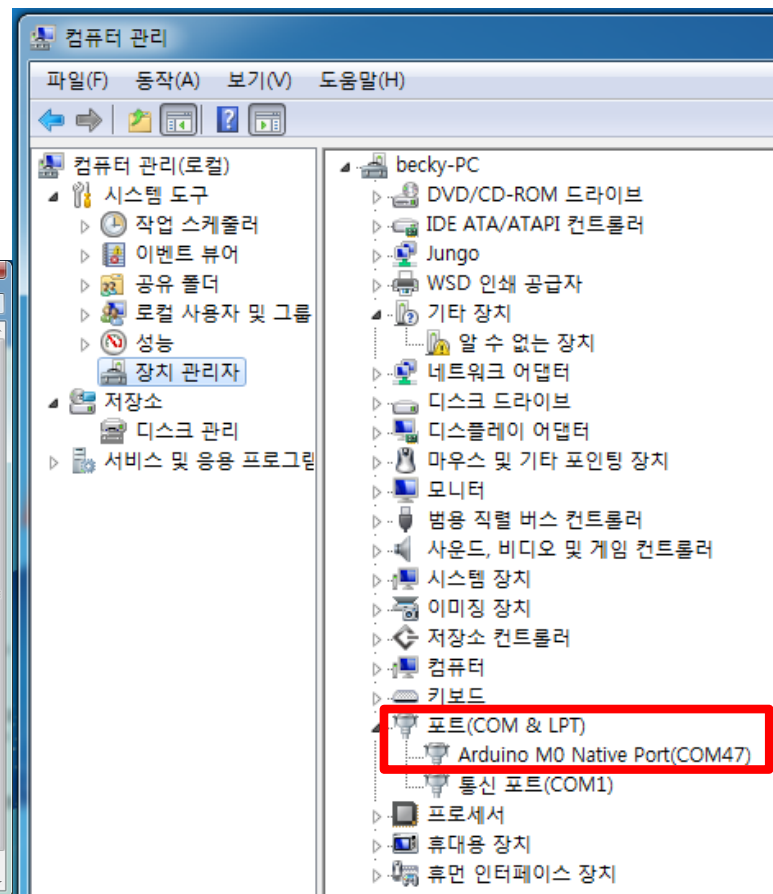
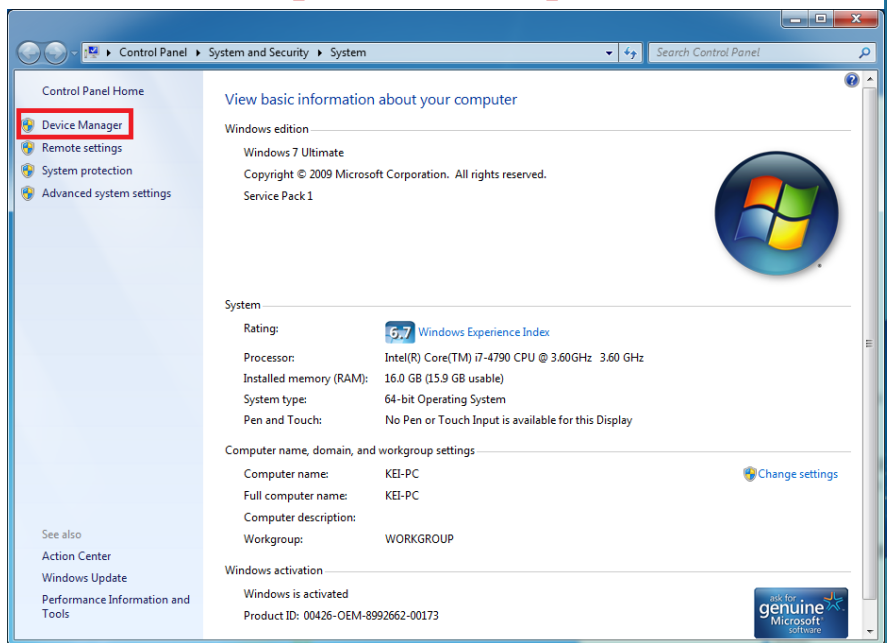
1. 파일(File) -> 환경설정(Preferences)
2. 다음 동작 중 자세한 설명 보이기(Show verbose output during): 업로드(upload)에 체크



실습 #1: 하드웨어 연결 및 확인

>> Arduino 보드 포트 확인

- 장치관리자에서 연결 확인
- 내 컴퓨터 [속성]
- -> [장치관리자] 클릭



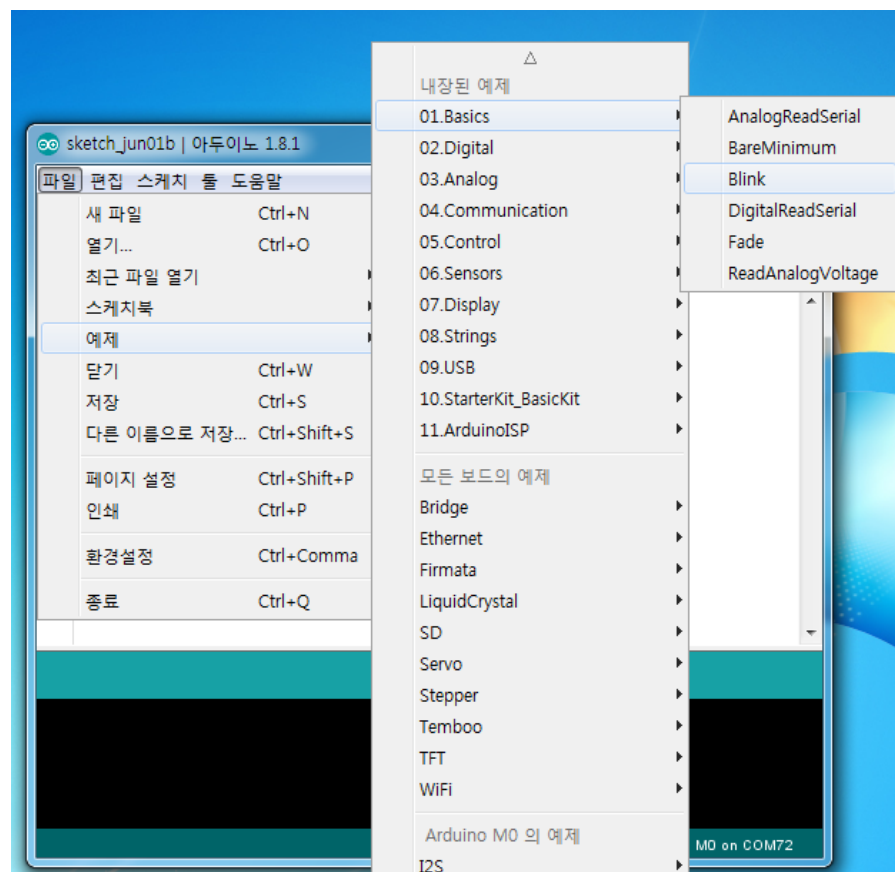
- 잘 모르겠으면 도움 요청!

실습 #1: 하드웨어 연결 및 확인

>> 하드웨어 연결 확인

- 예제 열기 →
- 보드 선택
- 포트 선택
- 업로드

Arduino M0





실습 #2

예제 사용하기

- Blink 예제 확인
- Blink 예제 응용

실습 #2: Blink 예제 확인

>> 밑그림이 있다

```
void setup() {  
    // put your setup  
  
}  
  
void loop() {  
    // put your main c  
  
}
```

```
void setup() {  
    pinMode(LED_BUILTIN, OUTPUT);  
}  
  
void loop() {  
    digitalWrite(LED_BUILTIN, HIGH);  
    delay(1000);  
    digitalWrite(LED_BUILTIN, LOW);  
    delay(1000);  
}
```

실습 #2: Blink 예제 확인

>> 아두이노 함수?

- $Y = X + Z$
- 괄호 안의 값에 따라 결과가 다르다
- 출력? 입력?
- 핀이란?
- 하이, 로우?
- 지연시간(delay)
- Digital 세계의 언어

```
void setup() {  
  pinMode(LED_BUILTIN, OUTPUT);  
}  
  
void loop() {  
  digitalWrite(LED_BUILTIN, HIGH);  
  delay(1000);  
  digitalWrite(LED_BUILTIN, LOW);  
  delay(1000);  
}
```



실습 #2: Blink 예제 응용

>> 조금씩만 바꿔봐요

- HIGH : 켜기
- LOW : 끄기
- delay() 안의
1은 1000의 1초
- 시간 바꿔보기
- 패턴 바꿔보기

```
void setup() {  
    pinMode(LED_BUILTIN, OUTPUT);  
}  
  
void loop() {  
    digitalWrite(LED_BUILTIN, HIGH);  
    delay(1000);  
    digitalWrite(LED_BUILTIN, LOW);  
    delay(1000);  
}
```


휴식1



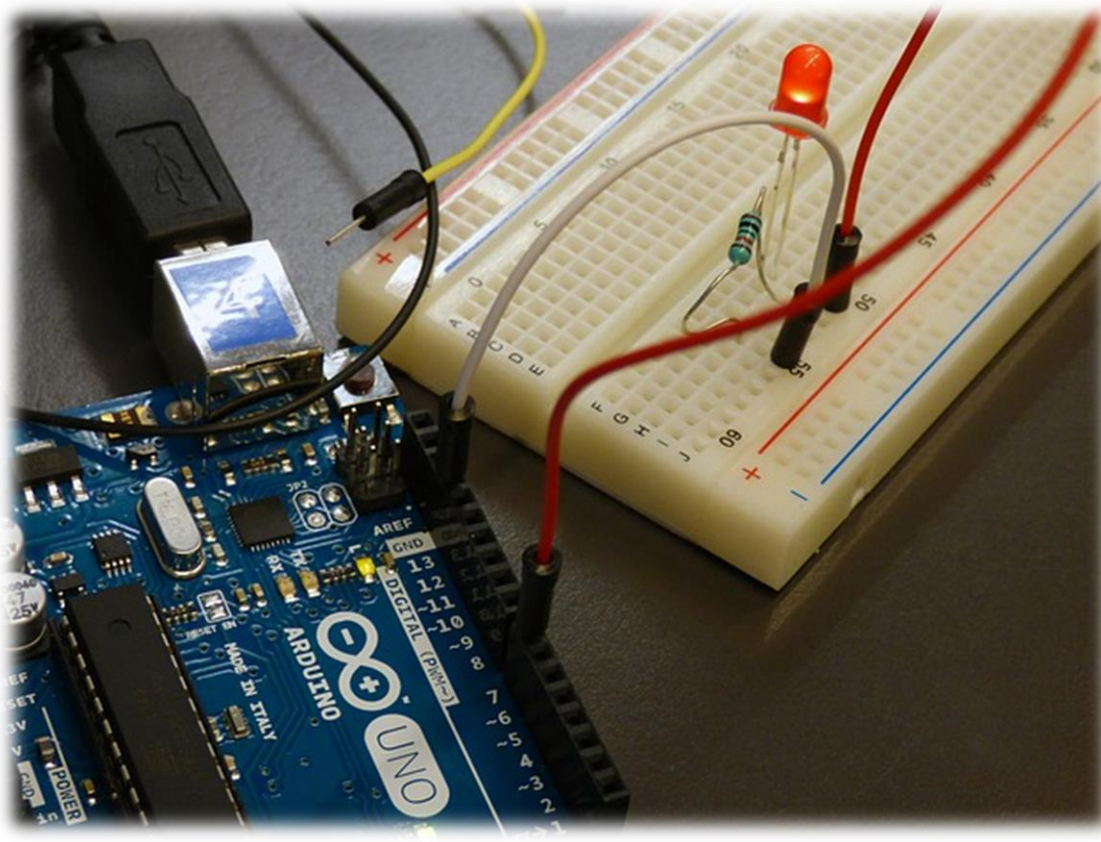
실습 #3

Sensor 동작 실습

- LED Sensor (Digital/Output)
- CDS Sensor (Analog/Input)

실습 #3: Sensor 동작 실습

» 브레드보드

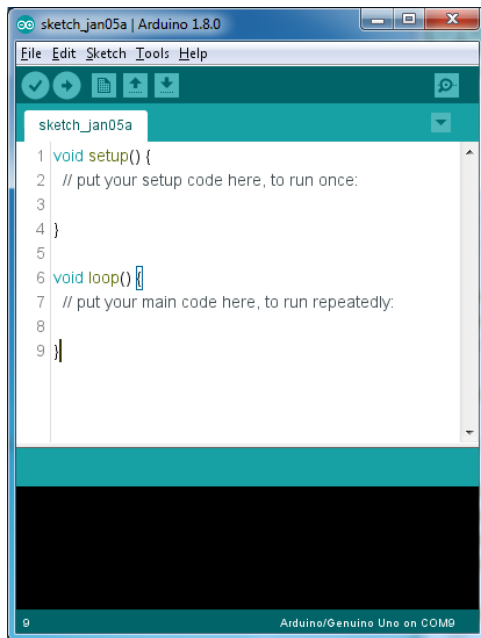


브레드보드 사용법

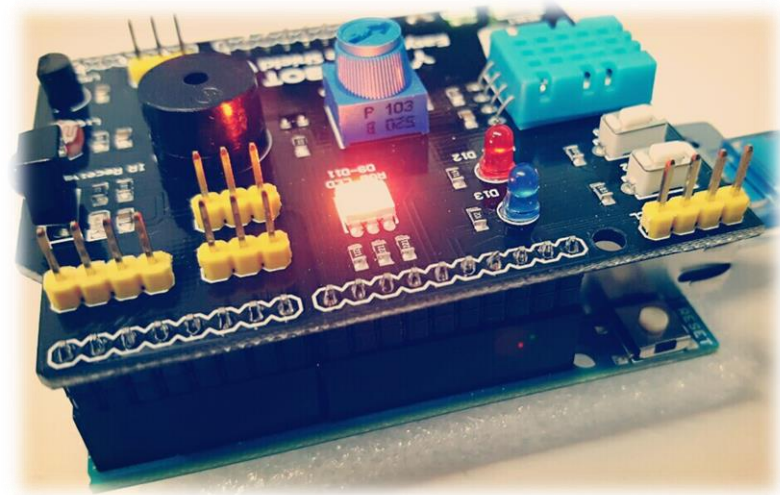
실습 #3: Sensor 동작 실습

» 센서 및 장치의 동작 확인

- IoT 서비스 구현 시 활용할 Arduino / Sensor 등 하드웨어 동작 확인
- Arduino 코드 구성 및 펌웨어 업로드 실습



Arduino IDE



WizArduino M0 ETH + Easy Module Shield V1

실습 #3: LED Sensor

>> RGB LED On/Off

```
sketch_jun01d | 아두이노 1.8.1
파일 편집 스케치 툴 도움말
sketch_jun01d $
1 void setup() {
2   // put your setup code here, to run once:
3   pinMode(9, OUTPUT);
4 }
5
6 void loop() {
7   // put your main code here, to run repeatedly:
8   digitalWrite(9, HIGH);
9   delay(1000);
10  digitalWrite(9, LOW);
11  delay(1000);
12 }
```

11 Arduino IDE on COM47

RGB LED
Light Emitting Diode
(Digital)

R : D9
G : D10
B : D11



실습 #3: CDS Sensor

>> 조도? 센서?

조도 : 밝은 정도

센서 : 감지(측정)하는 장비



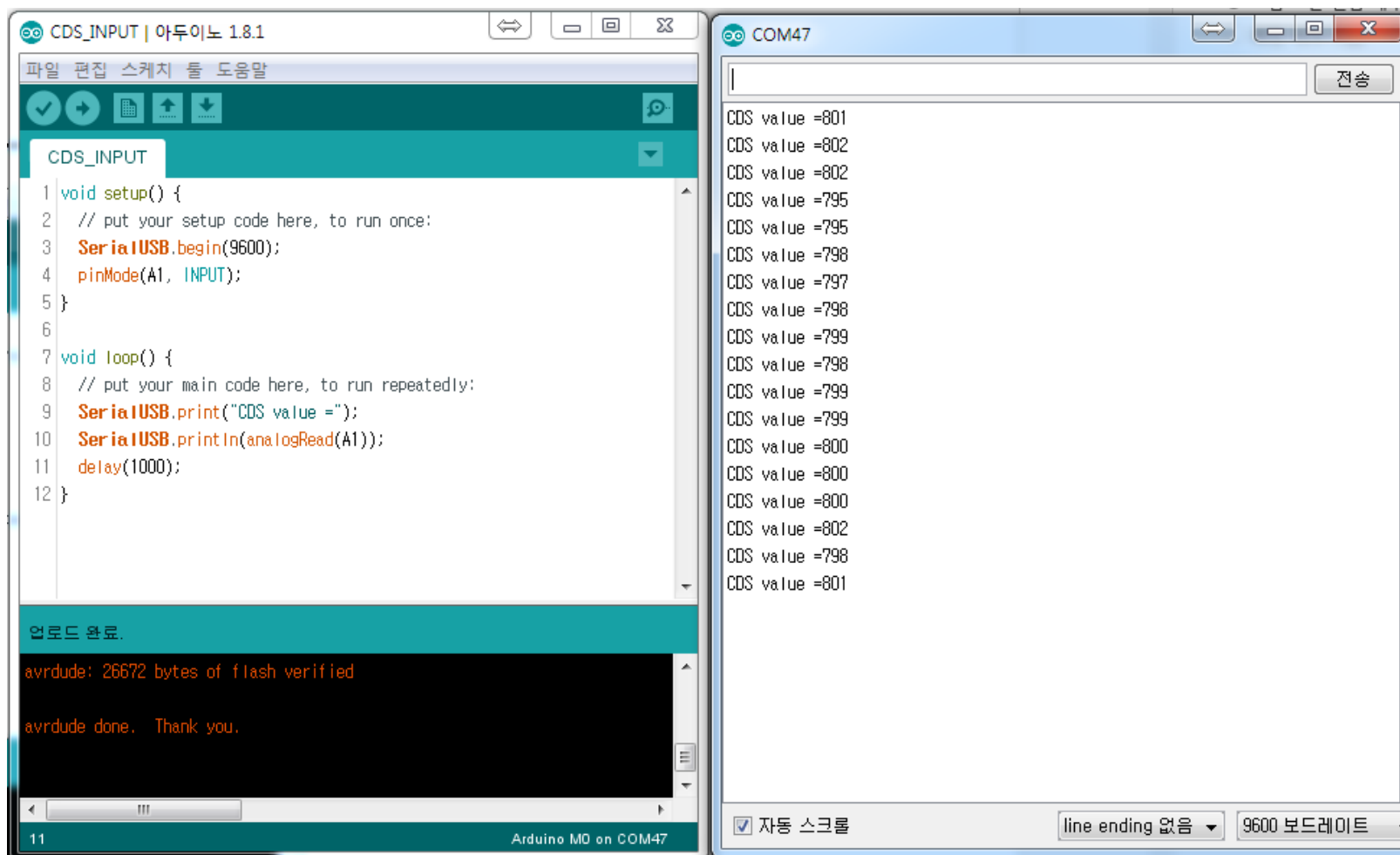
CDS(A1)
Light Sensor
(Analog)



밝기↑ 저항↓

실습 #3: CDS Sensor

>> 조도? 센서?



The screenshot displays the Arduino IDE interface. The left pane shows the 'CDS_INPUT' sketch for an Arduino Uno 1.8.1. The code defines a setup function to initialize the serial port and pin A1, and a loop function to read the sensor value and print it. The right pane shows the serial monitor connected to COM47, displaying a series of 'CDS value' readings. The bottom status bar indicates the upload was successful, with 26672 bytes of flash verified.

```
1 void setup() {  
2   // put your setup code here, to run once:  
3   SerialUSB.begin(9600);  
4   pinMode(A1, INPUT);  
5 }  
6  
7 void loop() {  
8   // put your main code here, to run repeatedly:  
9   SerialUSB.print("CDS value =");  
10  SerialUSB.println(analogRead(A1));  
11  delay(1000);  
12 }
```

업로드 완료.
avrdude: 26672 bytes of flash verified
avrdude done. Thank you.

CDS value =801
CDS value =802
CDS value =802
CDS value =795
CDS value =795
CDS value =798
CDS value =797
CDS value =798
CDS value =799
CDS value =798
CDS value =799
CDS value =799
CDS value =799
CDS value =800
CDS value =800
CDS value =800
CDS value =802
CDS value =798
CDS value =801

11 Arduino IDE on COM47

휴식2



실습 #4

응용 실습

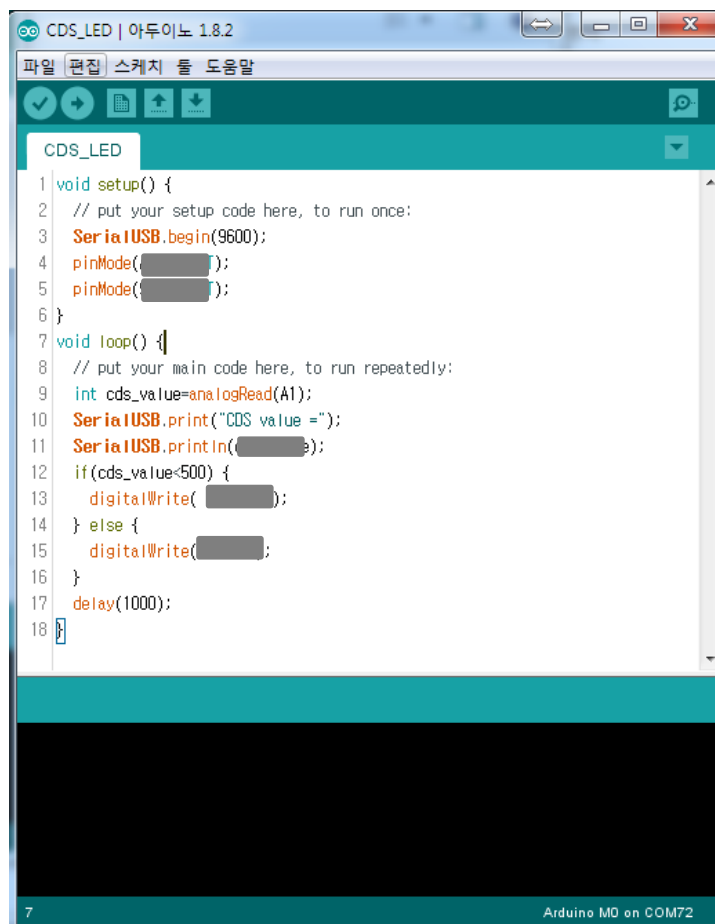
- 가로등 만들기 (조도센서/LED)

실습 #4: 가로등 만들기



실습 #4: 가로등 만들기

» 조도센서/LED 응용



```
1 void setup() {
2   // put your setup code here, to run once:
3   SerialUSB.begin(9600);
4   pinMode( );
5   pinMode( );
6 }
7 void loop() {
8   // put your main code here, to run repeatedly:
9   int cds_value=analogRead(A1);
10  SerialUSB.print("CDS value =");
11  SerialUSB.println( );
12  if(cds_value<500) {
13    digitalWrite( );
14  } else {
15    digitalWrite( );
16  }
17  delay(1000);
18 }
```



조도 센서 입력값에 따라
LED ON! OFF!



감사합니다