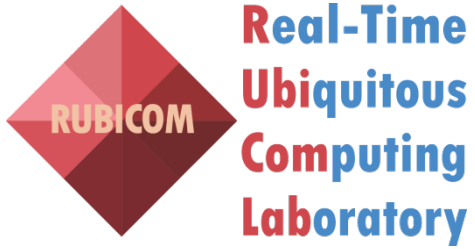
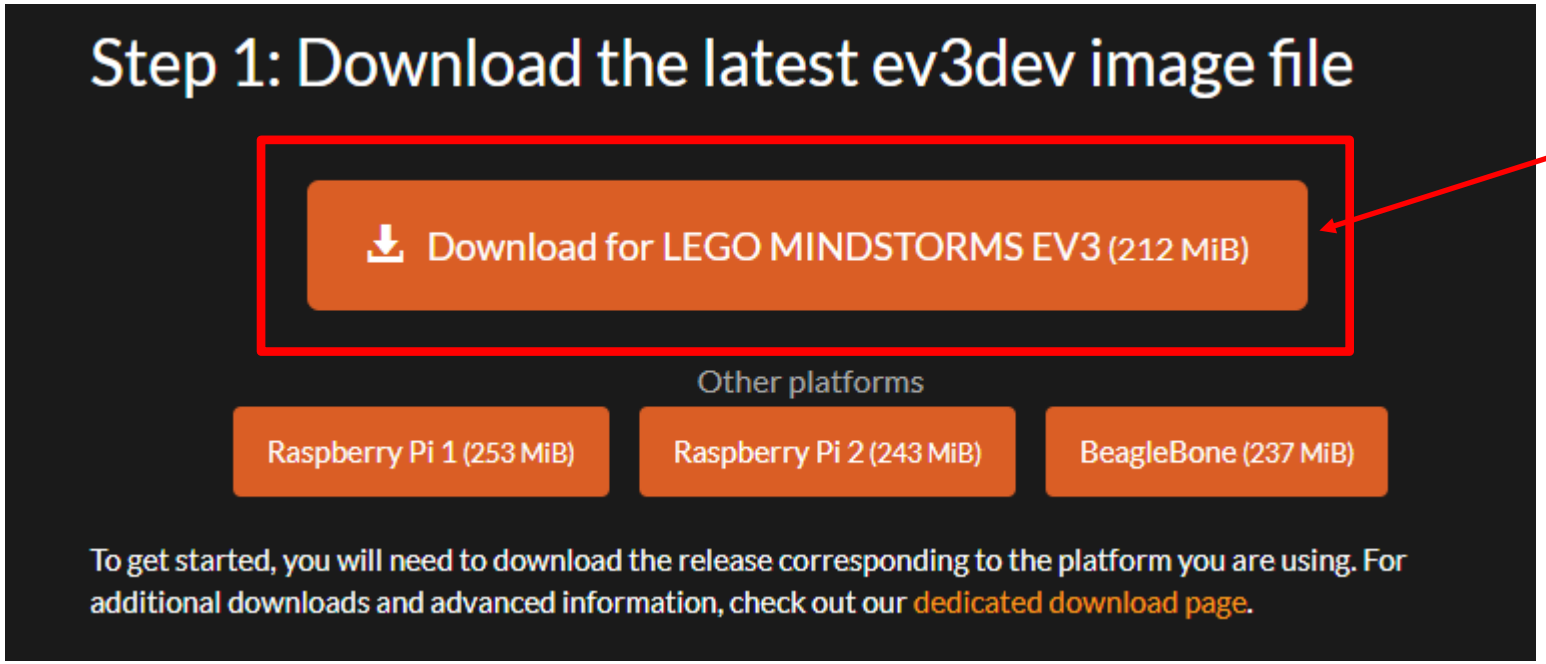
Ev3dev **설치**

****재부팅의 경우, 슬라이드 12번부터 하세요**



Ev3dev 이미지 다운로드

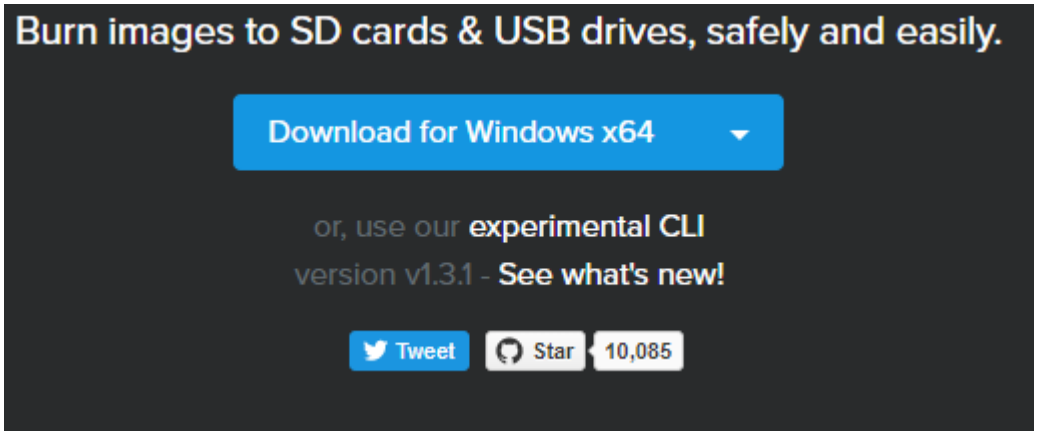
- http://www.ev3dev.org/docs/getting-started/#step-1-download-the-latest-ev3dev-image-file 접속
- 이미지 다운로드



Etcher설치

- https://etcher.io/ 접속
- Pc 운영체제에 맞게 etcher설치

(실습실 컴퓨터 : Ethcher for Window x64(64-bit)

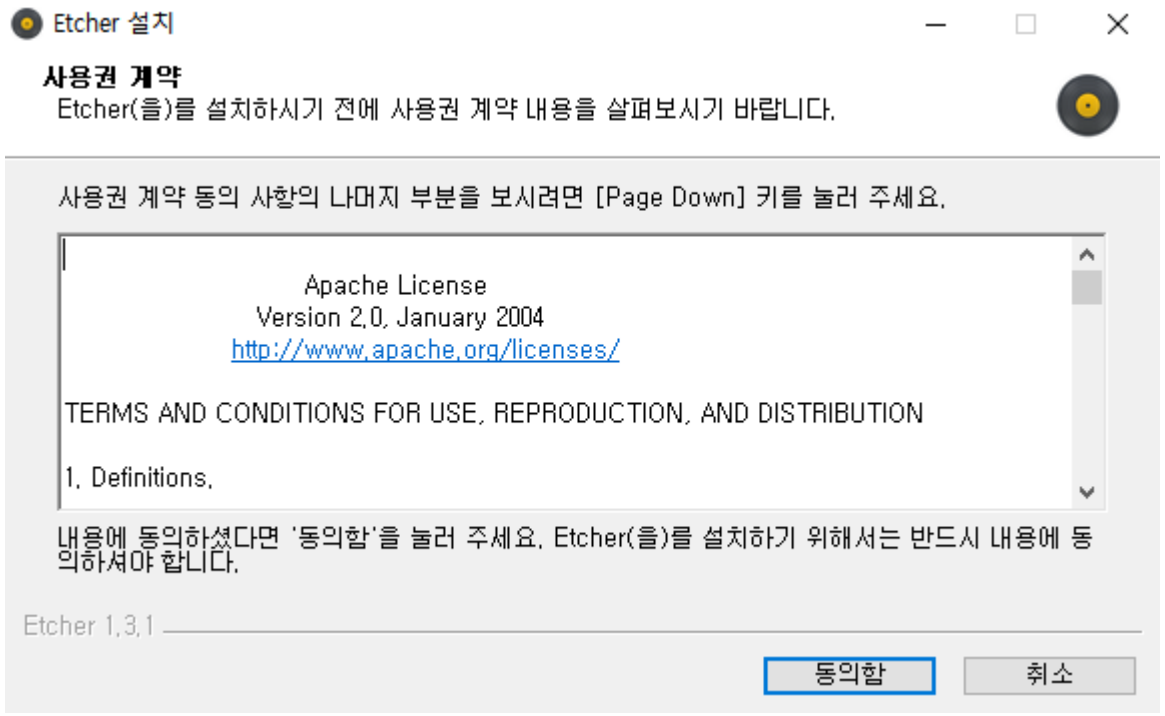


Etcher설치

- Micro sd card를 리더기에 삽입

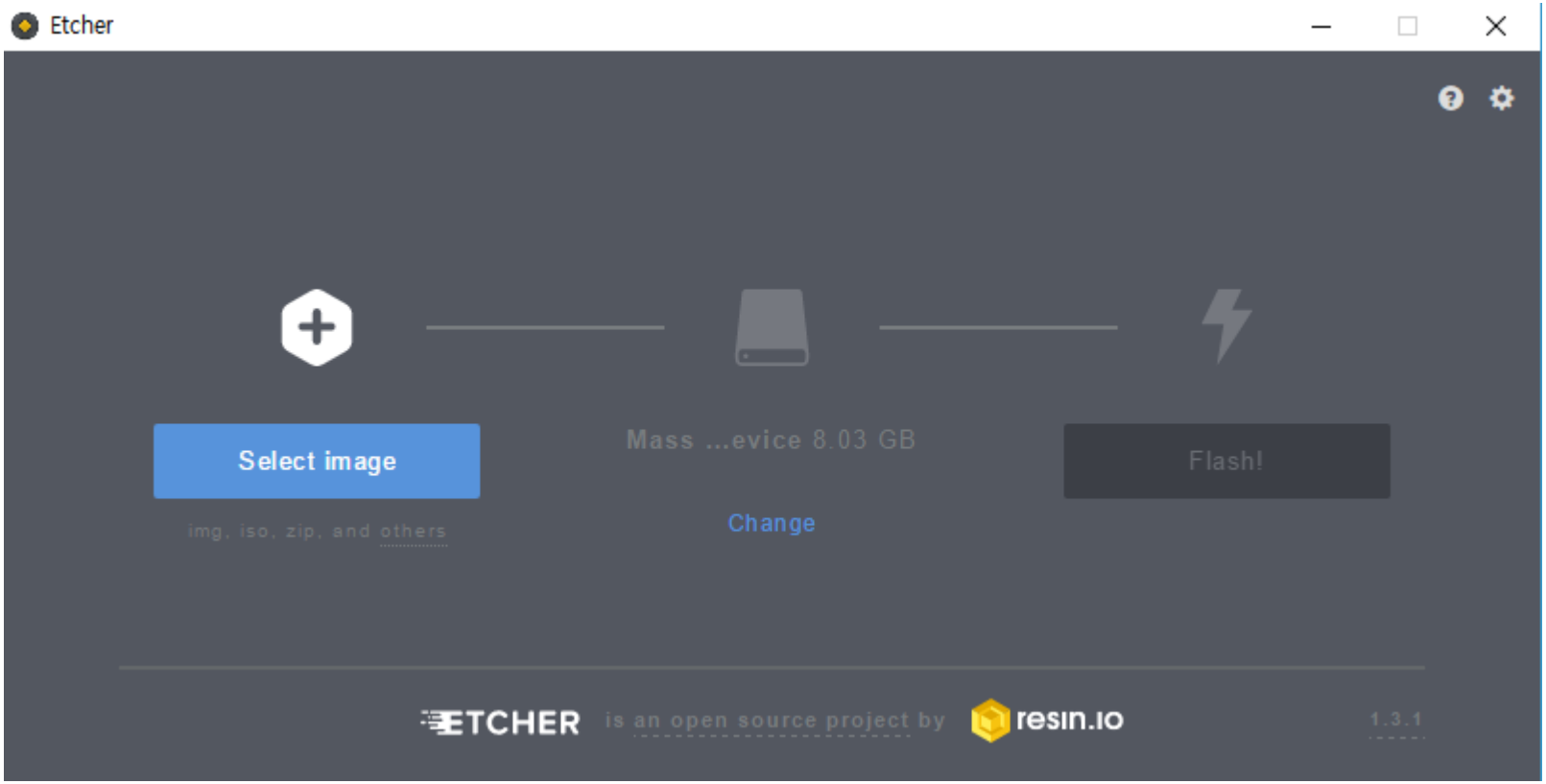
- Pc의 usb port에 삽입

Etcher설치(Etcher-Portable-1.3.1-x64실행)



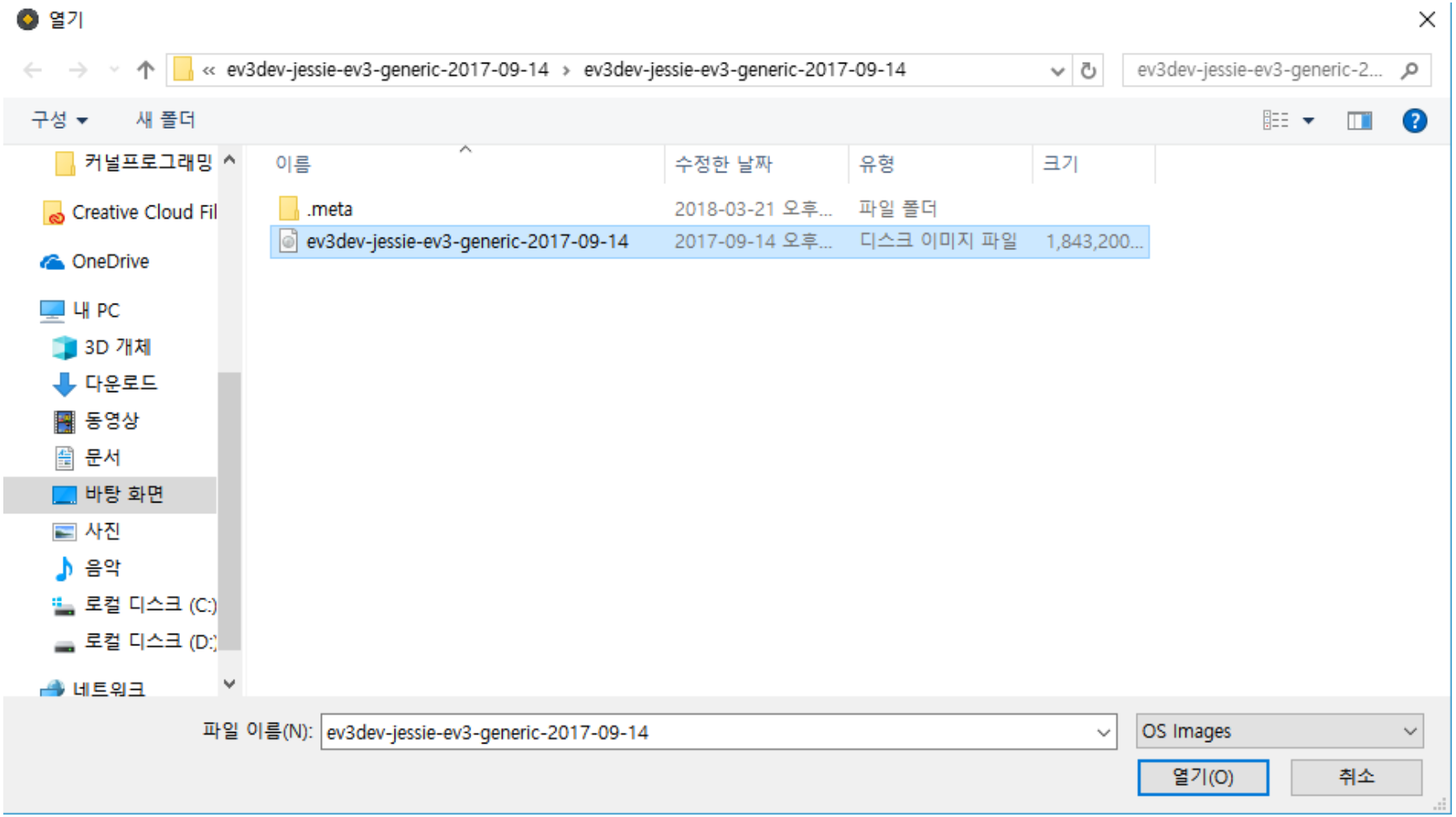
EV3 Image 설치

- select image 선택



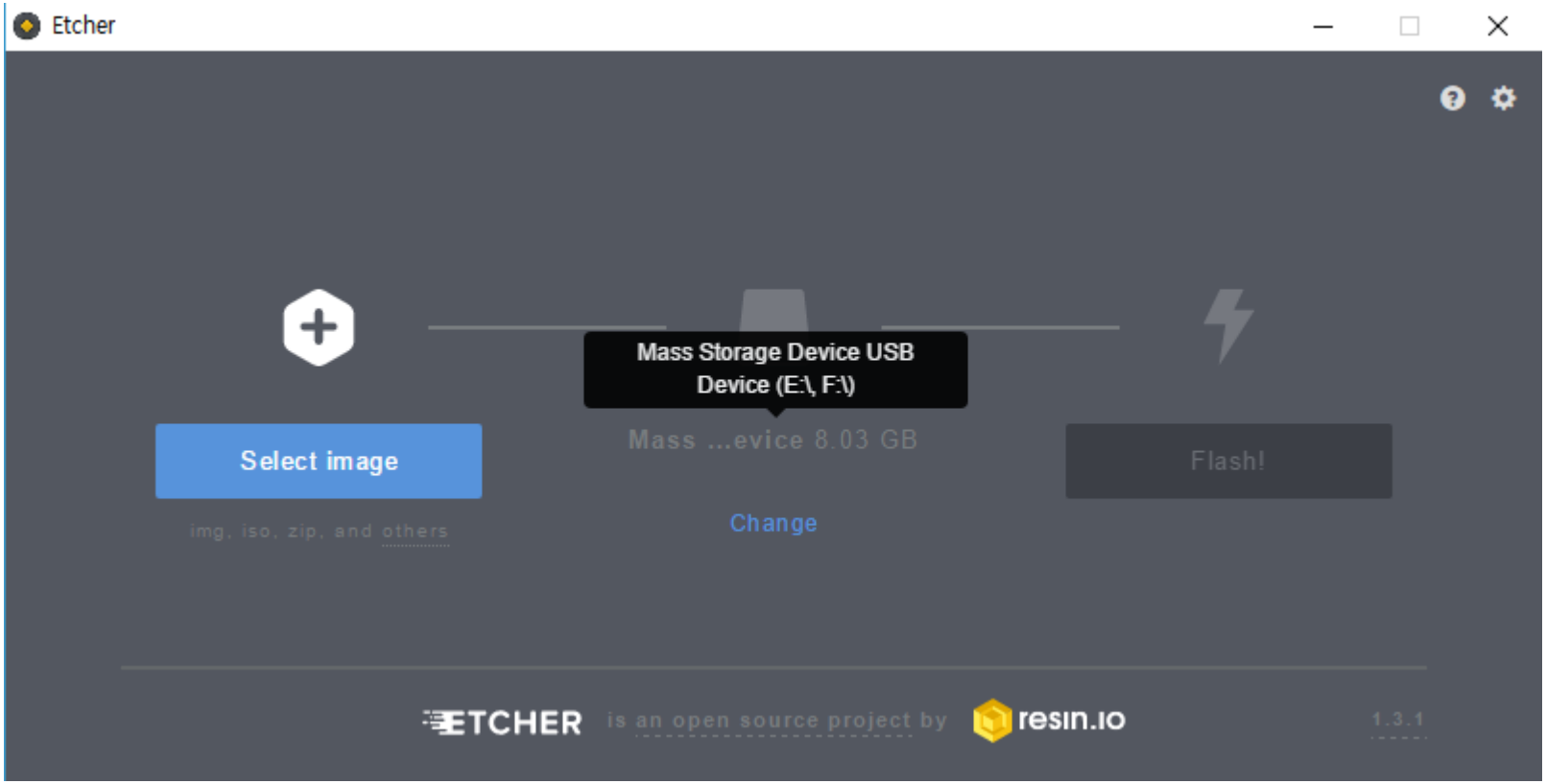
EV3 Image 설치

- ev3dev 이미지 선택



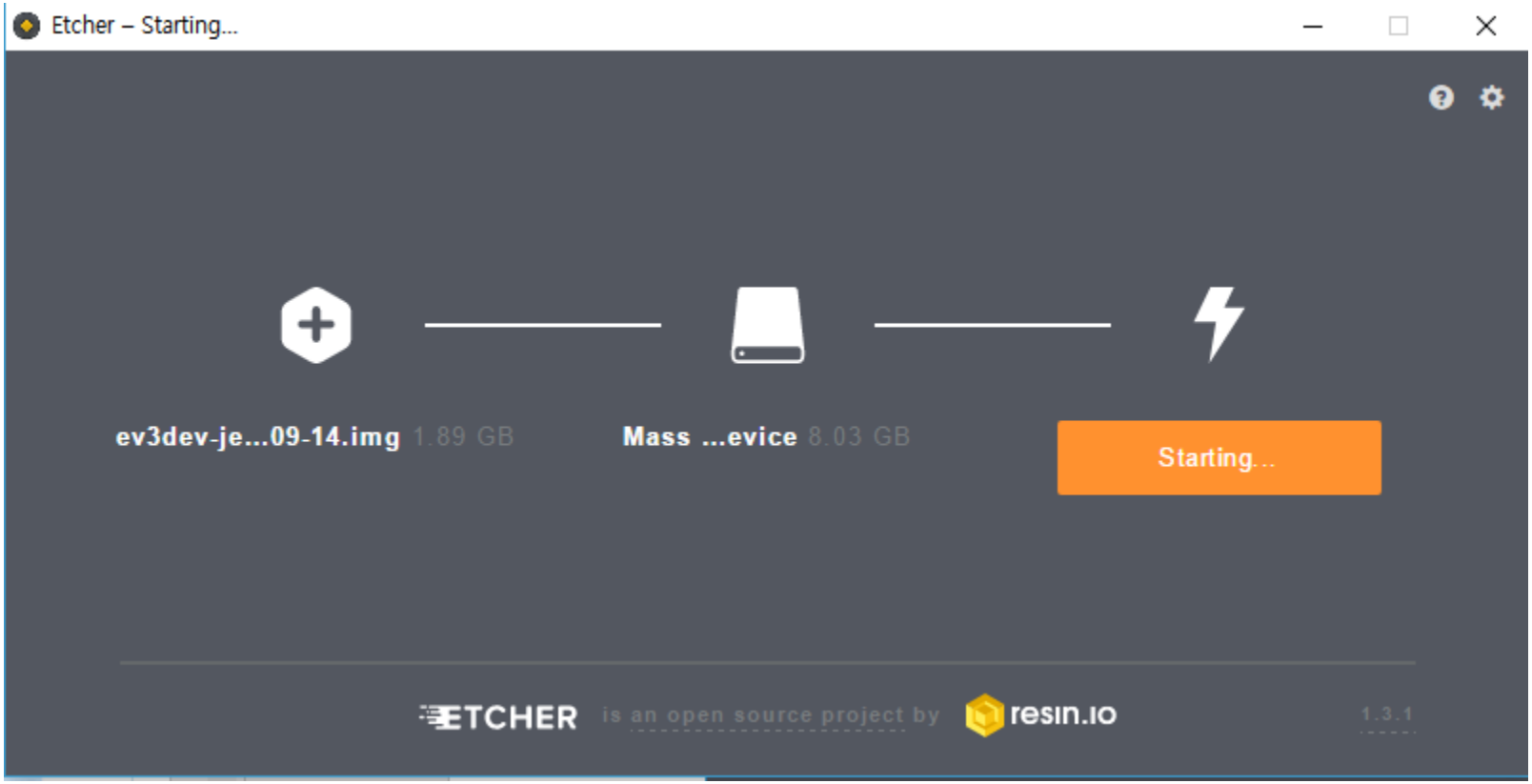
EV3 Image 설치

- 경로가 본인 usb인지 확인(중요!)



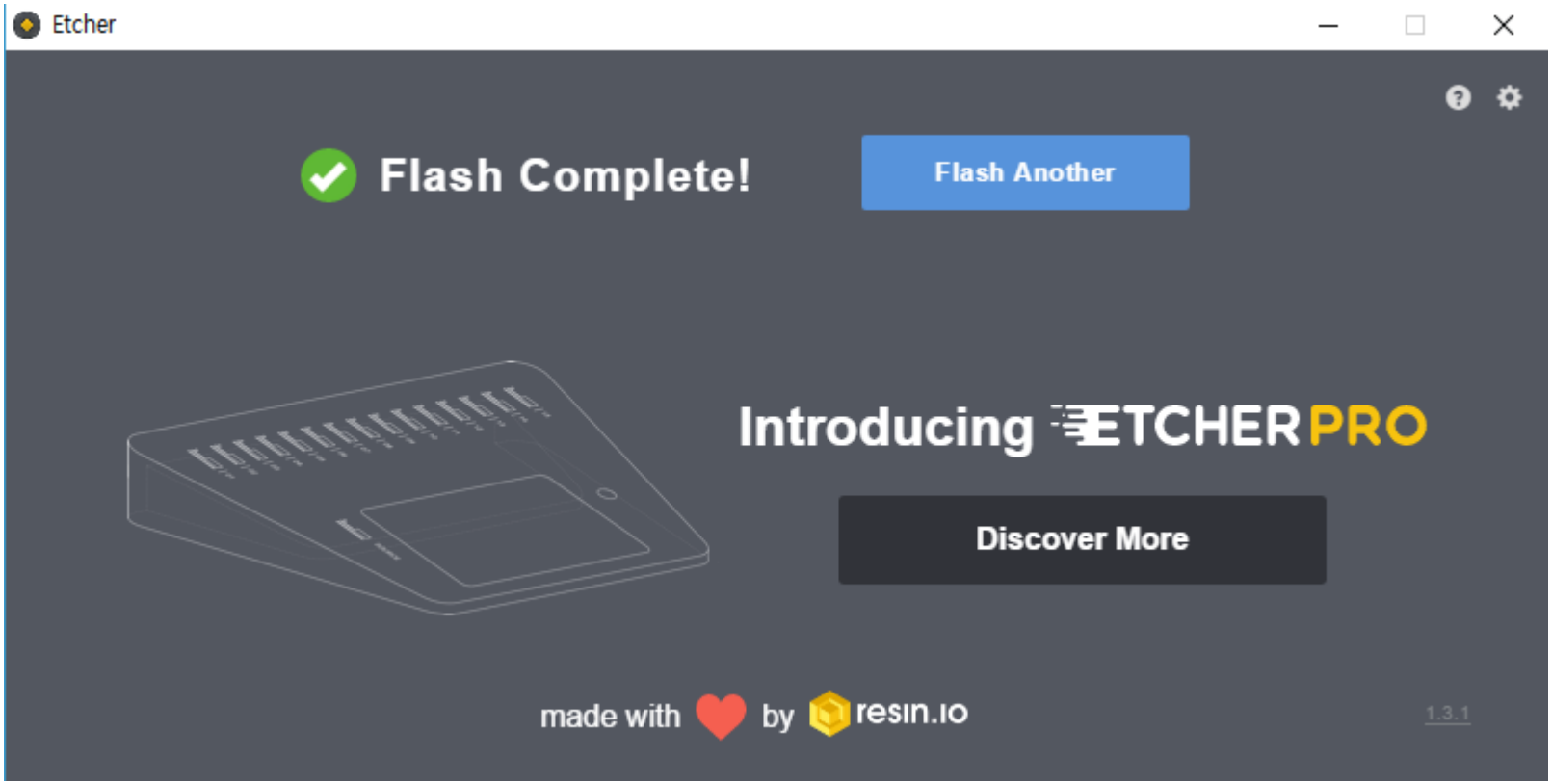
EV3 Image 설치

- flash버튼 클릭



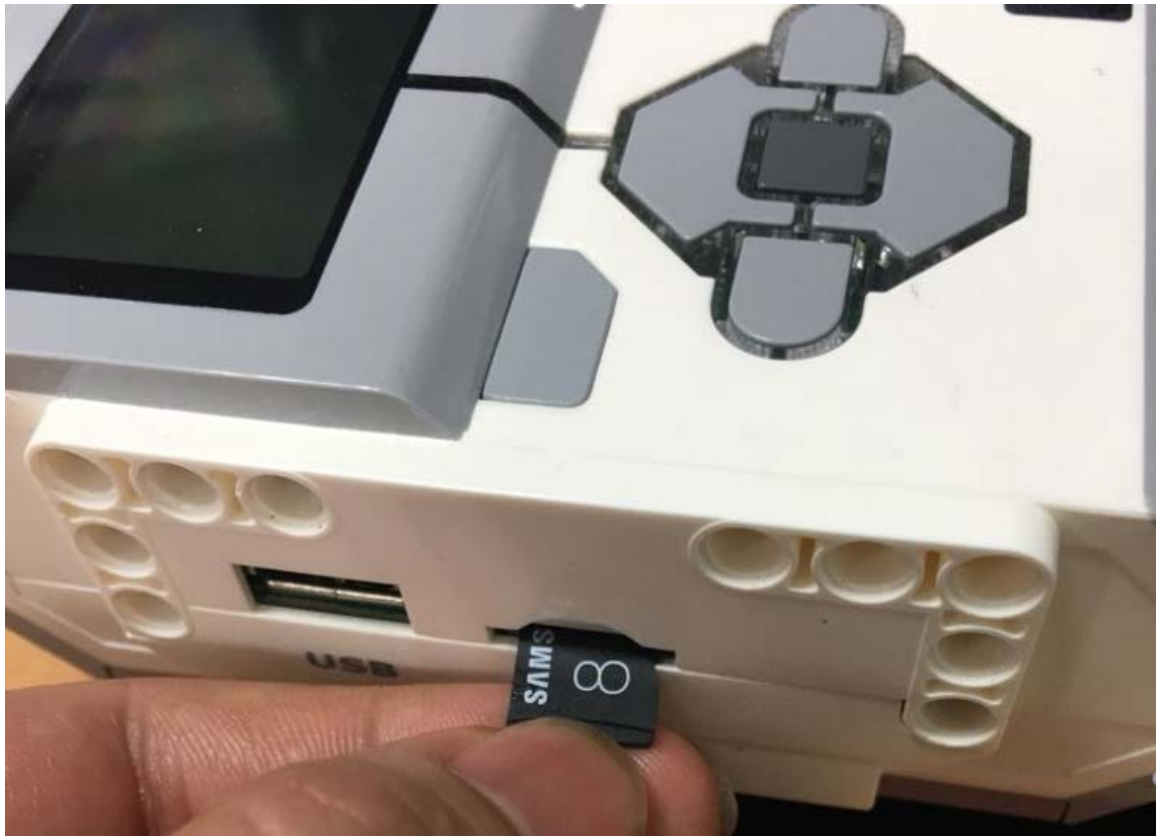
EV3 Image 설치

- 완료 화면



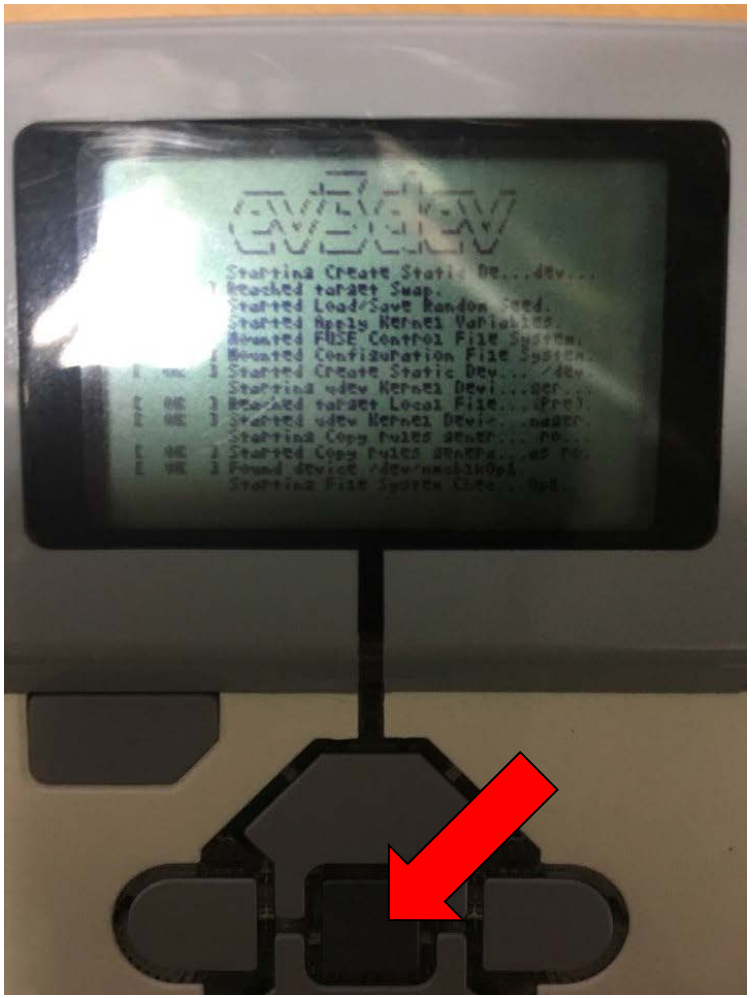
EV3 부팅

- ev3에 micro sd card 삽입



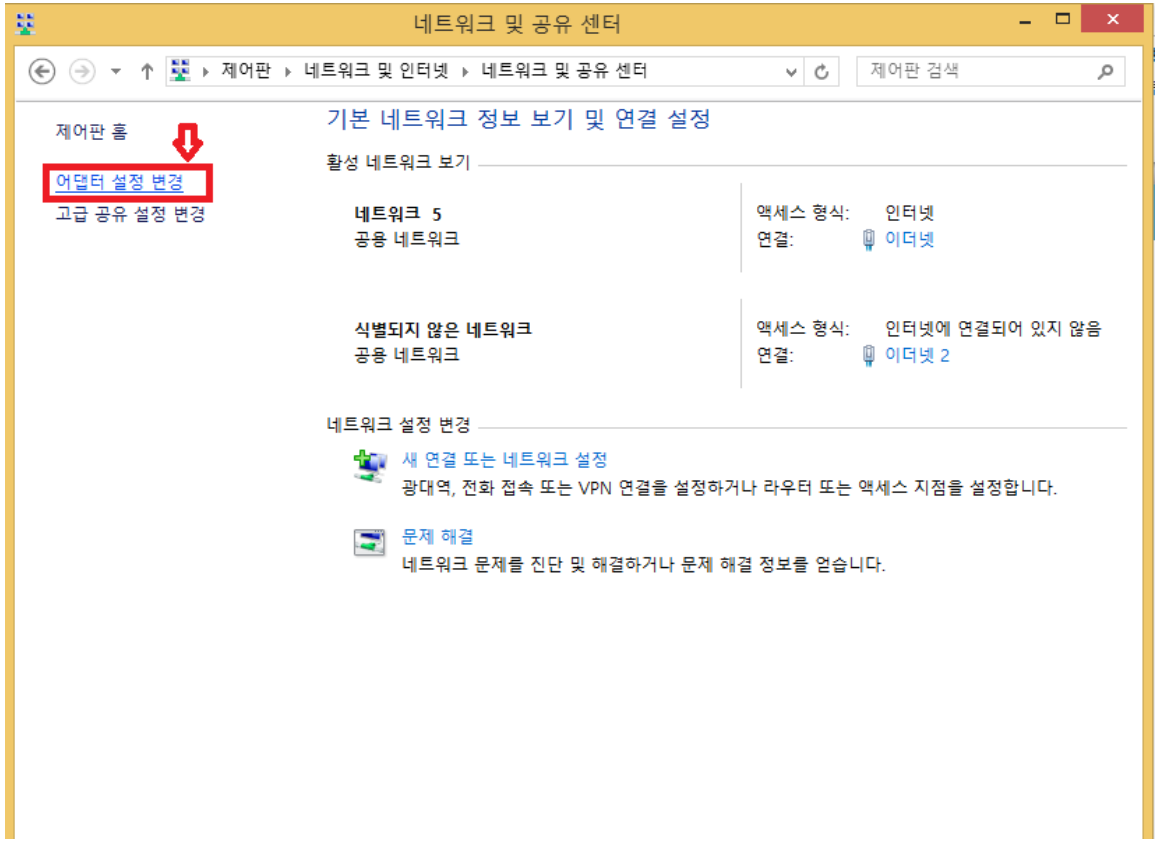
Ev3 부팅

- ev3dev으로 부팅
  - 가운데 버튼 2초간 클릭



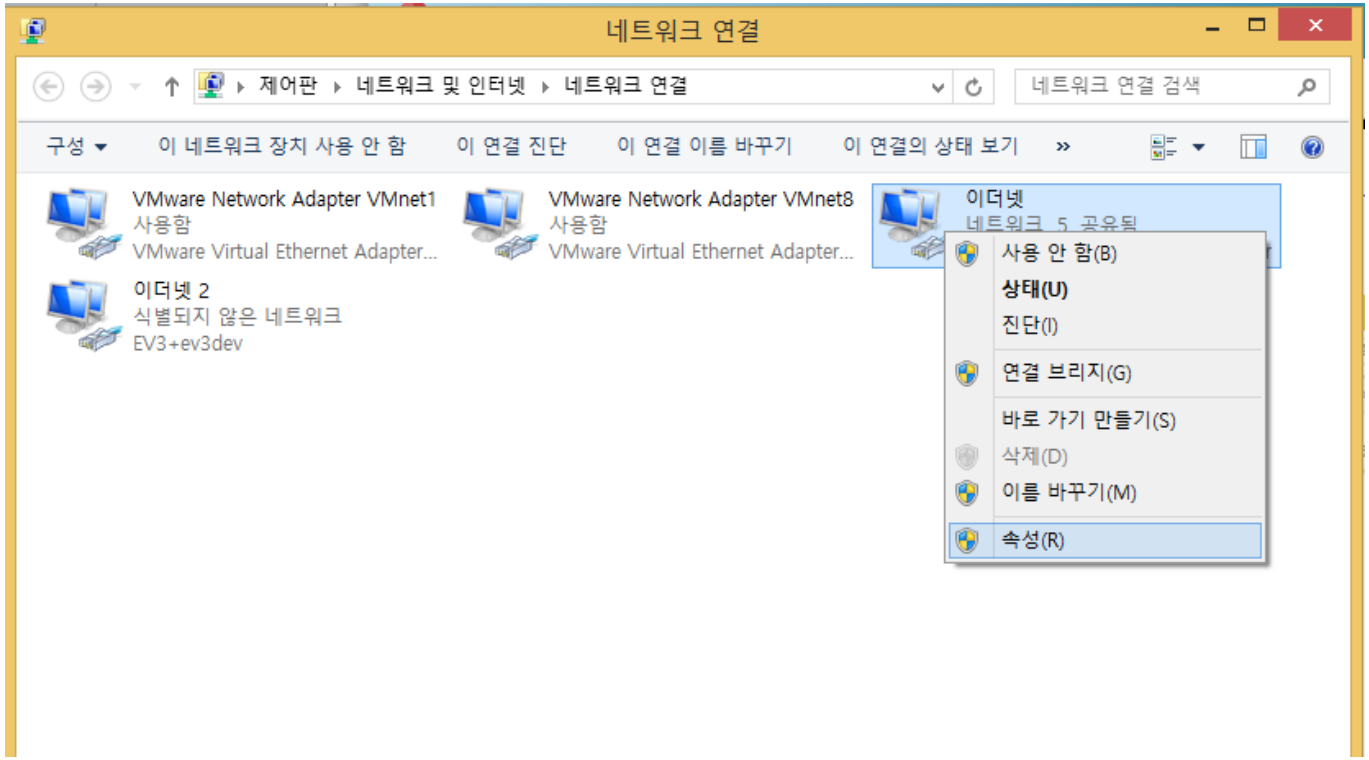
컴퓨터 네트워크 설정

- Usb케이블(ev3키트에 있음)로 컴퓨터와 ev3를 연결
- 1. 어댑터 설정 변경 클릭



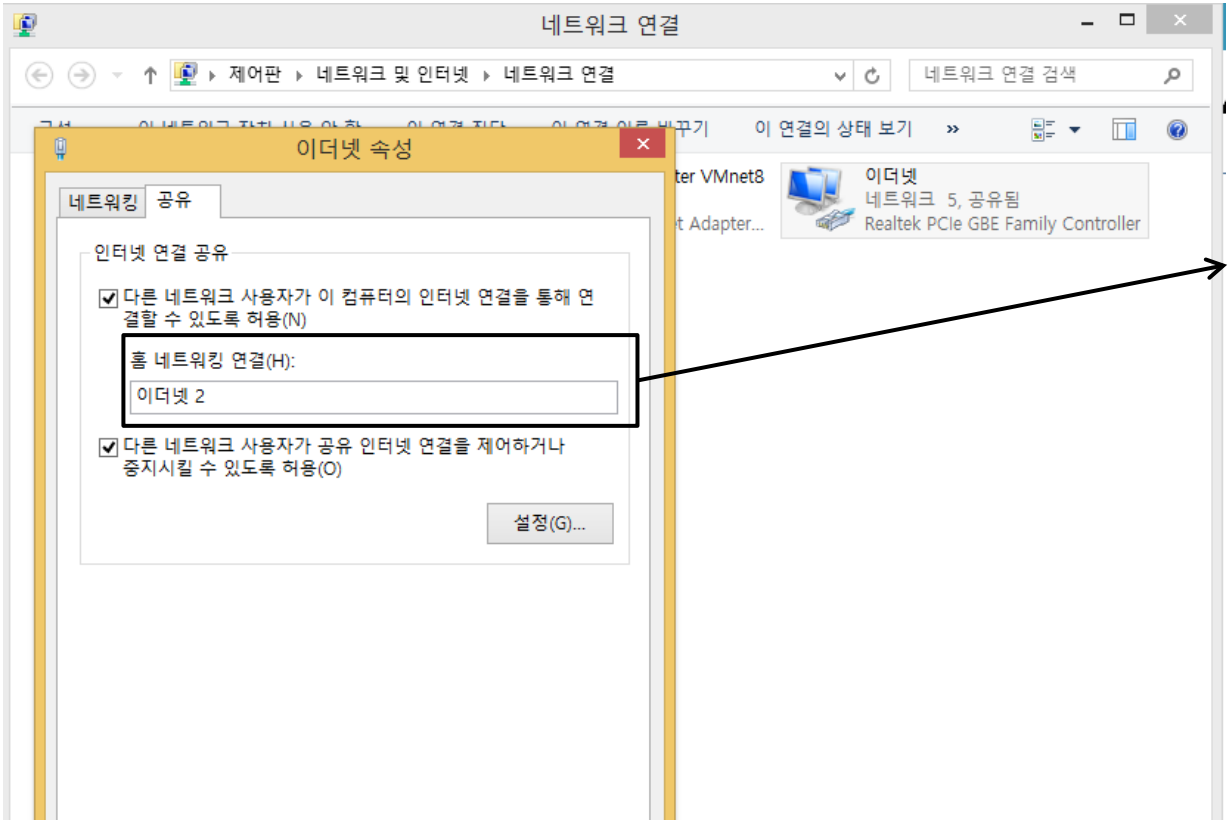
컴퓨터 네트워크 설정

- 2. 이더넷의 속성 클릭



컴퓨터 네트워크 설정

- 3. 공유 탭에서 체크박스 아래의 사진과 같이 체크

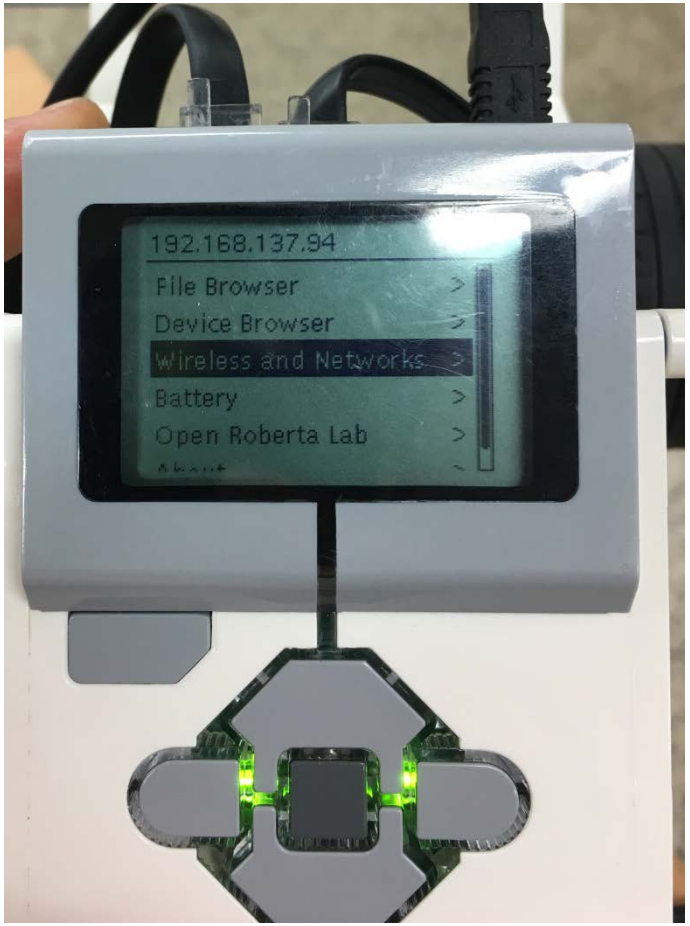


<예외상황>
1. 홈 네트워킹 연결 선택란이 뜨지 않는다
->체크박스만 체크하고 다음 과정 진행

2. 홈 네트워킹 연결 선택란에 이더넷 2대신 이더넷3가 있다
->이더넷 3로 연결

Ev3 네트워크 설정

- Wireless and Networks 들어가기



Ev3 네트워크 설정

- All network connections 들어가기

Ev3 네트워크 설정

- Wired 선택

Ev3 네트워크 설정

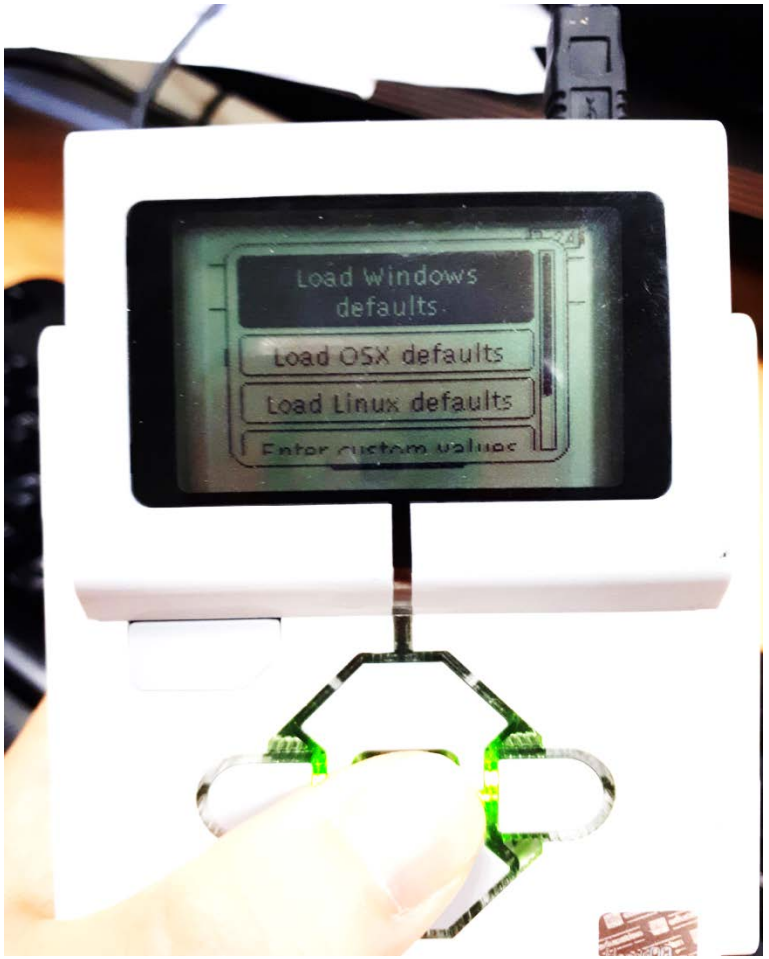
- IPv4 선택

Ev3 네트워크 설정

- Change 선택

Ev3 네트워크 설정

- Load Wndows defaults 선택 (선택후 아무 변화 없는게 정상)

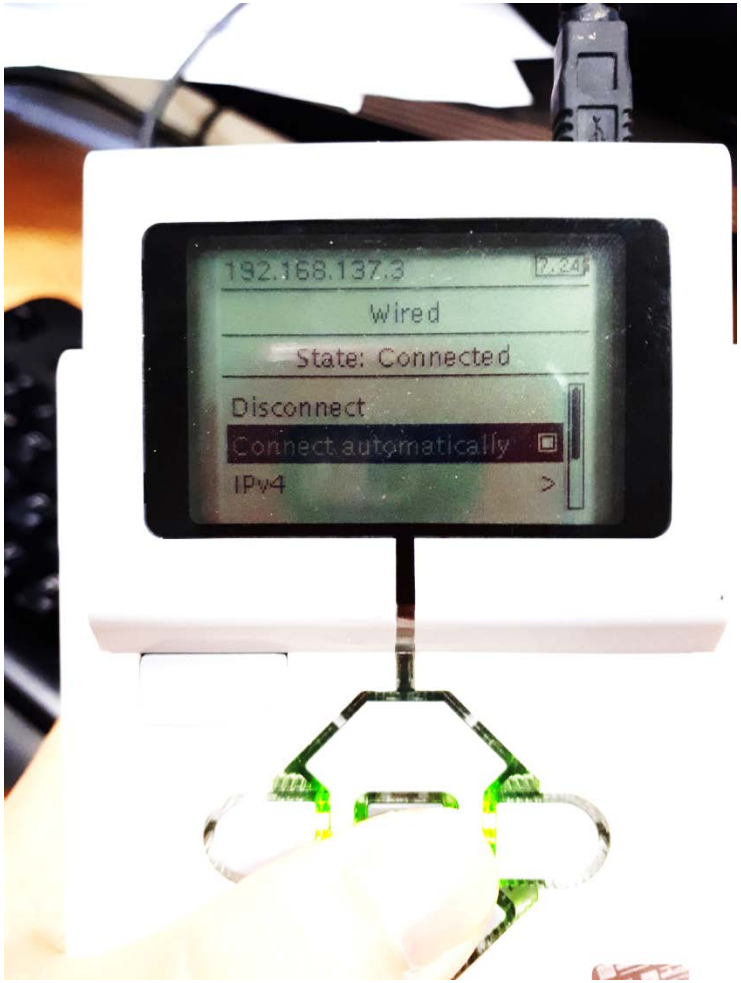


Ev3 네트워크 설정

- 이전 메뉴(왼쪽 위버튼) 로 간 뒤 connect선택

Ev3 네트워크 설정

- 화면 상단에 IP가 떠야 정상. 그 다음에 connect automatically 체크

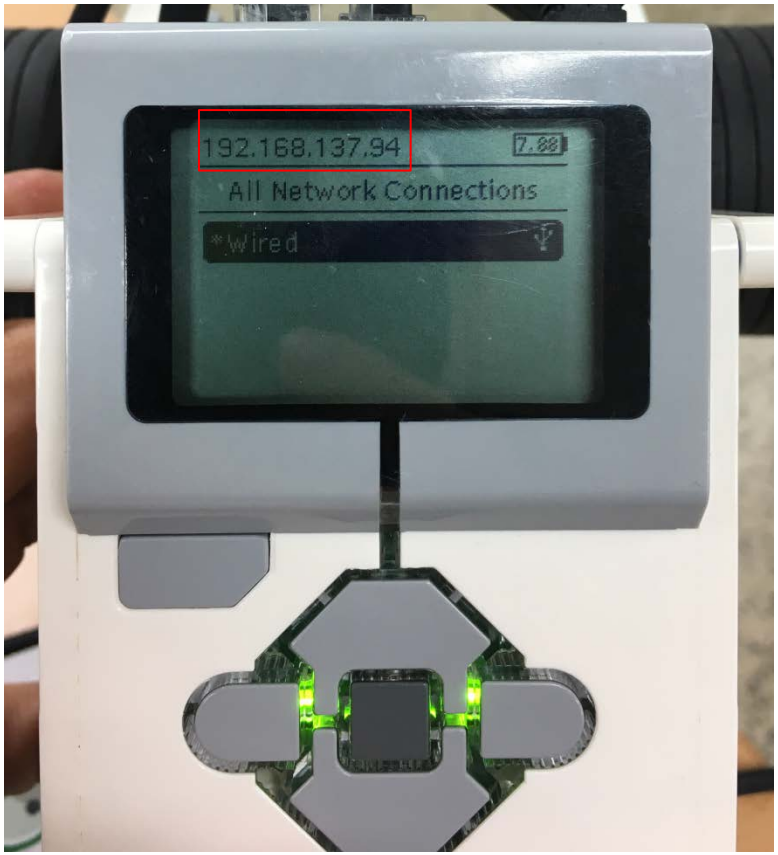


Ev3 네트워크 설정

- 이전메뉴로 가서 wired 앞에 *표시 뜬 것 확인

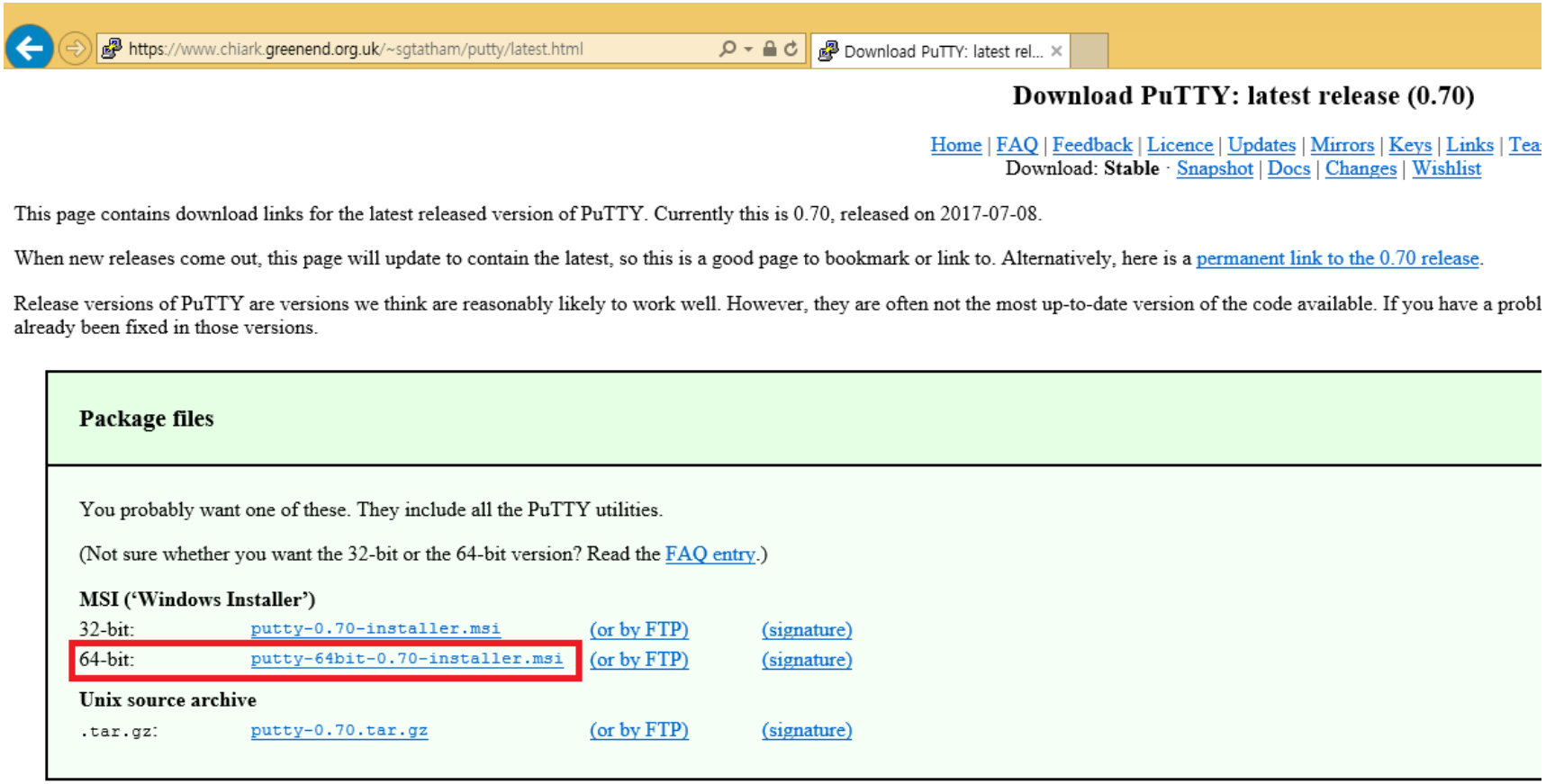
Ev3 ip 확인

- ip : 192.168.~.~ 가 여러분 ev3의 ip입니다.(기억하기)



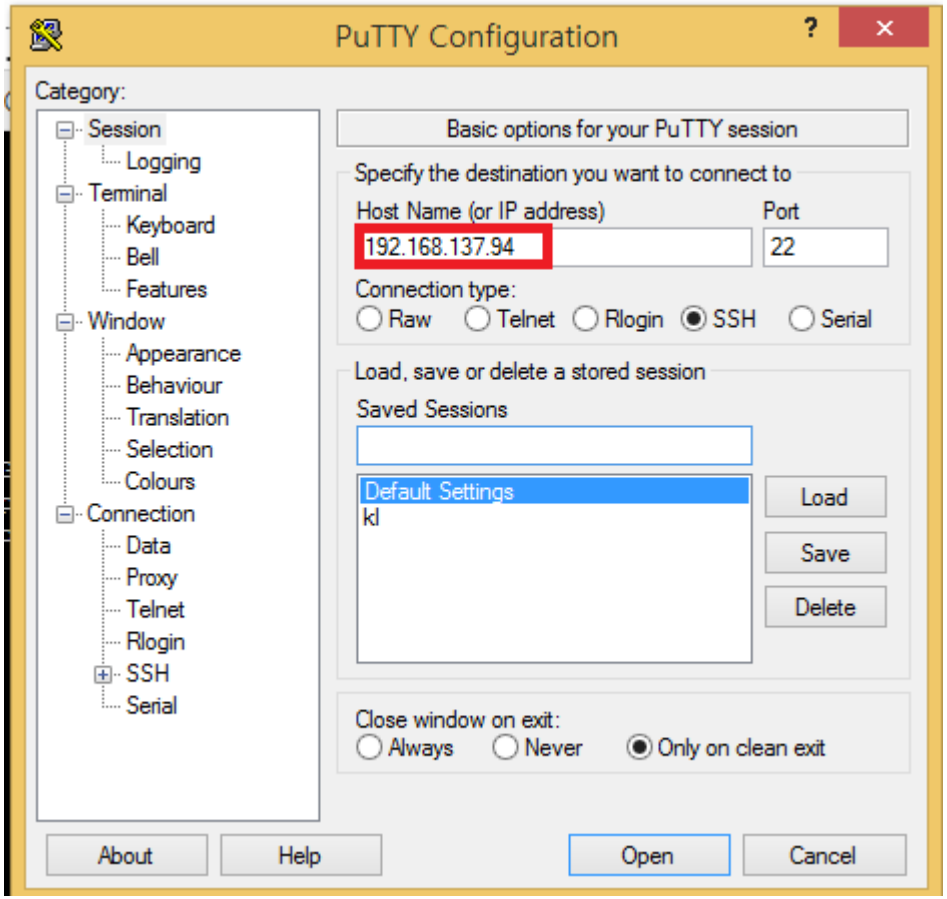
Putty설치

- https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html



Putty 실행

- 빨간 박스처럼 ev3의 ip넣기

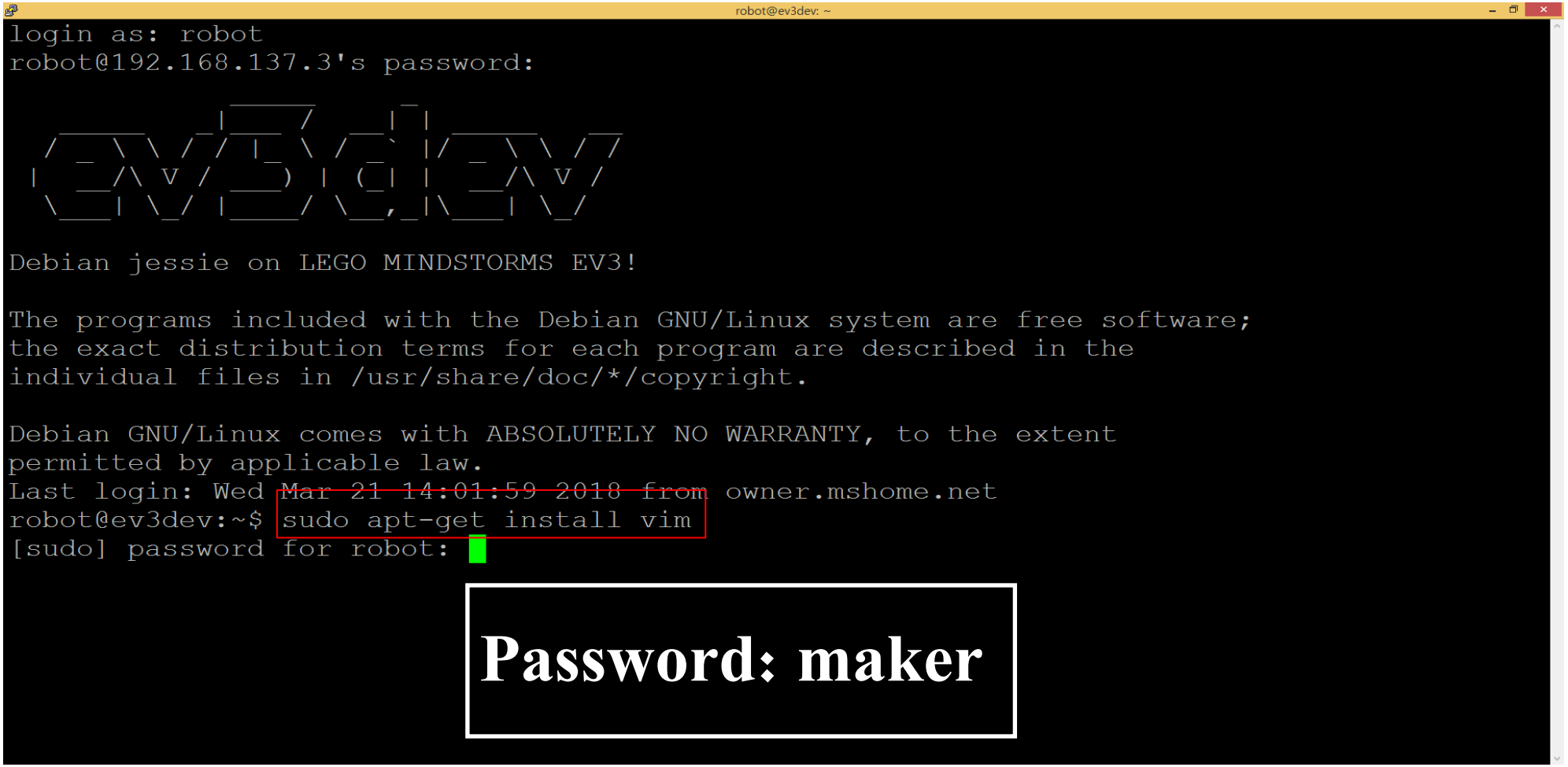


Putty 실행

- Login id: robot
- Login password: maker

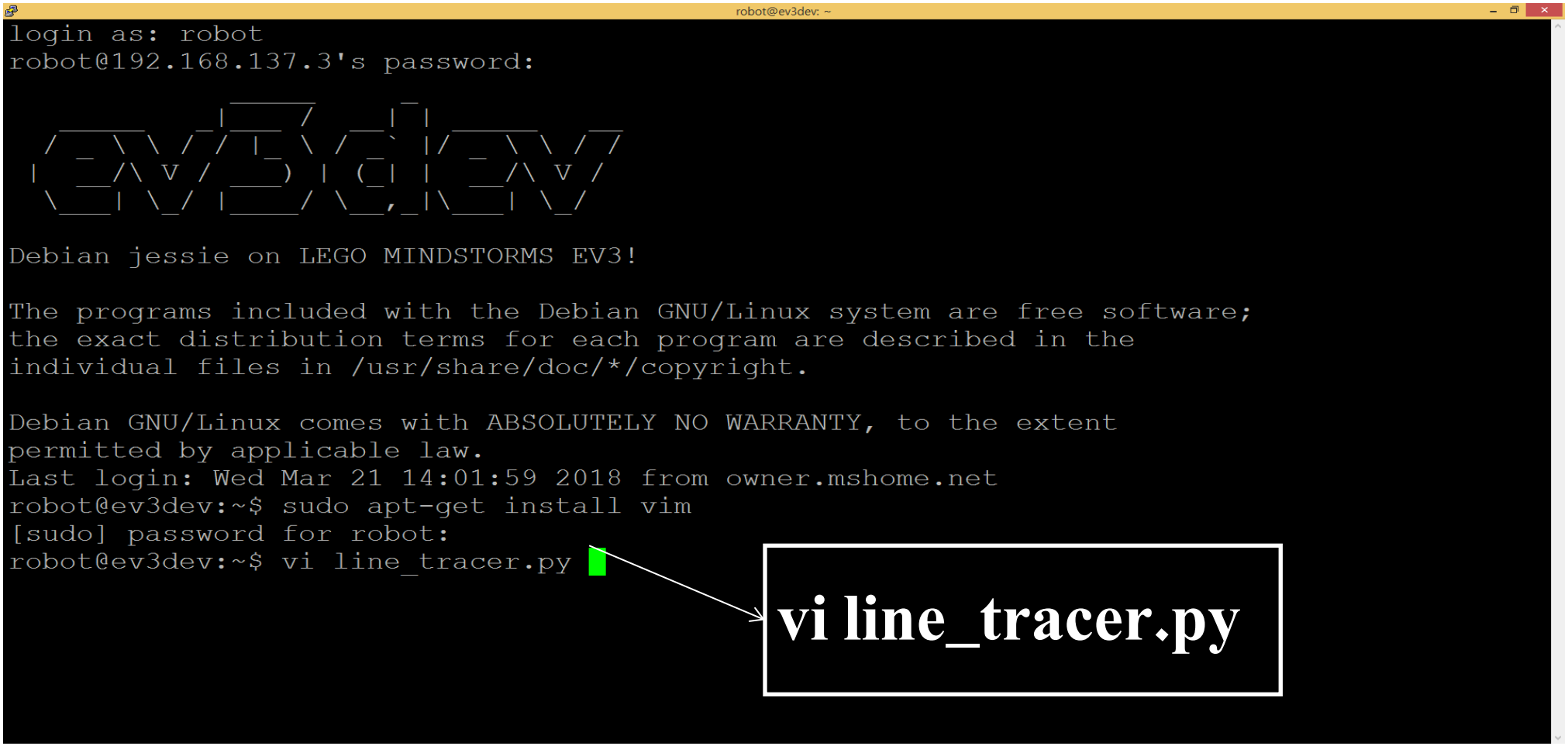
Line_tracer 코드 작성

1. vim 편집기를 설치합니다.



Line_tracer 코드 작성

2. line_tracer.py 파일을 vim편집기로 엽니다.



vi/vim 사용법

3. 코드를 입력할 때 참고하세요

- 텍스트를 입력할때 i (편집기 하단에 --INSERT--가 뜨면 입력가능)

아래 명령어는 텍스트를 입력하는 상태에서 esc를 누른 뒤 입력
(즉, 편집기 하단에 --INSERT--가 사라진 상태가 되면 입력)
****콜론(:)을 반드시 함께 입력해야합니다!

- 저장시 :w
- Vi편집기 종료시 :q
- 저장과 종료를 동시에 :wq
- 저장하지 않고 종료 :q!

Line_tracer 코드 작성

4. line_tracer.py에 입력하세요

```
#!/usr/bin/env python3
from ev3dev.ev3 import *

btn = Button() # will use any button to stop script

# Connect EV3 color sensor.
cl = ColorSensor()

# Put the color sensor into COL-REFLECT mode
# to measure reflected light intensity.
cl.mode='COL-REFLECT'

# Attach large motors to ports B and C
mB = LargeMotor('outB')
mC = LargeMotor('outC')
```

Line_tracer 코드 작성

4. line_tracer.py에 이어서 입력하세요

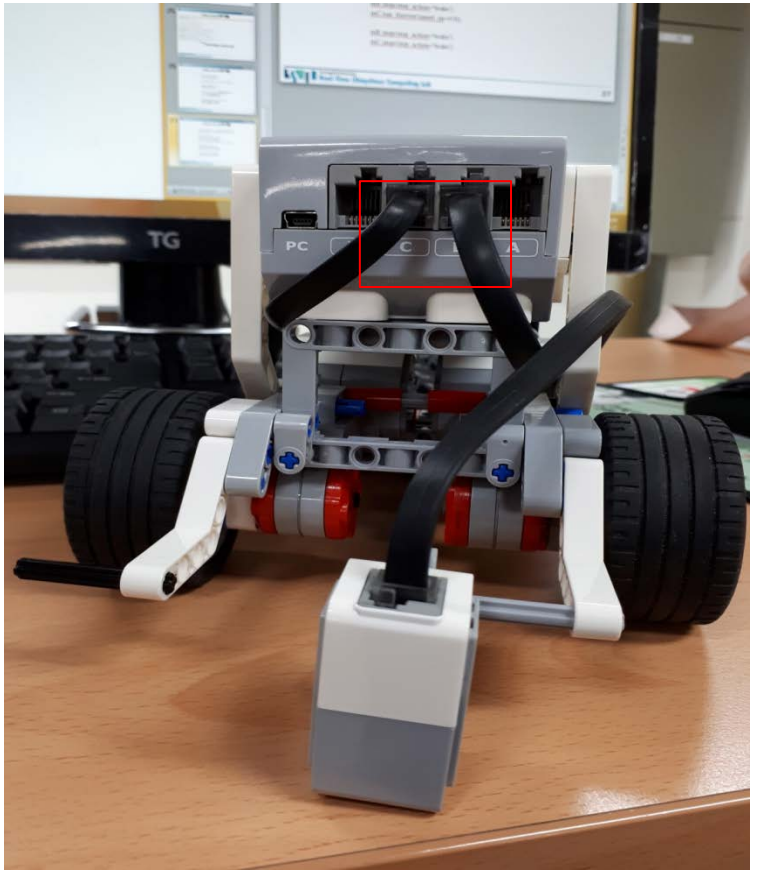
```
while not btn.any():    # exit loop when any button pressed
        if cl.value()<30:   # weak reflection so over black line
                # medium turn right
                mB.run_forever(speed_sp=450)
                mC.stop(stop_action='brake')
        else:   # strong reflection (>=30) so over white surface
                # medium turn left
                mB.stop(stop_action='brake')
                mC.run_forever(speed_sp=450)


mB.stop(stop_action='brake')
mC.stop(stop_action='brake')
```

하드웨어 조립

5. ev3포트에 센서와 모터를 연결해주세요

컬러센서

모터(B와 C에 꽂아야함)



파일 실행

6. line_tracer.py를 실행합니다 (종료는 ev3의 버튼을 누르면 됨)

```
robot@ev3dev: ~
login as: robot
robot@192.168.137.3's password:
                _____     _
  _____   _____|___ /  __| | _____   __
 / _ \ \ / / |_ \ / _` |/ _ \ \ / /
|  __/\ V / ___) | (_| |  __/\ V /
 \___| \_/ |____/ \__,_|\___| \_/

Debian jessie on LEGO MINDSTORMS EV3!

The programs included with the Debian GNU/Linux system ar
e free software;
the exact distribution terms for each program are describ
ed in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to th
e extent
permitted by applicable law.
Last login: Wed Mar 21 13:00:37 2018 from owner.mshome.ne
t
robot@ev3dev:~$ vi line_tracer.py
robot@ev3dev:~$ python3 line_tracer.py
```

python3 line_tracer.py

실행 영상