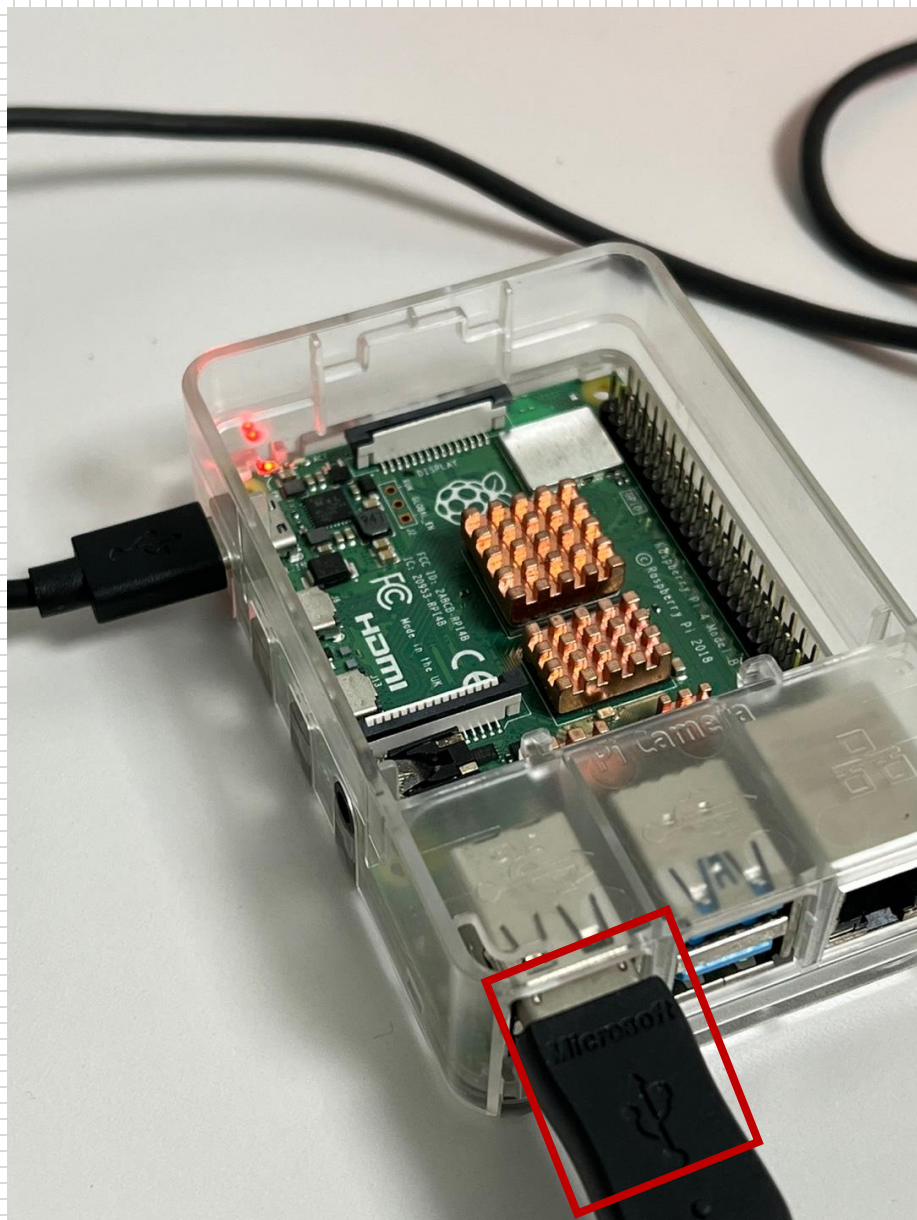


라즈베리파이 연결



웹캠 연결



1. Raspberry pi 안에 Node-Red 설치하기

<https://iotmaker.kr/iotbook-install-raspi-node-red/>

<https://reddb.tistory.com/123>

1). 최신버전으로 업데이트

```
sudo apt update
```

```
sudo apt upgrade
```

2). Node.js 설치

```
sudo curl -sL https://deb.nodesource.com/setup_16.x | sudo -E bash
```

```
apt list | grep nodejs
```

```
pi@raspberrypi:~ $ apt list | grep nodejs
WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

netdata-plugins-nodejs/stable 1.29.3-4 all
nodejs-doc/stable 12.22.12~dfsg-1~deb11u1 all
nodejs/unknown 14.20.0~deb-1nodesource1 armhf
```

```
sudo apt-get install nodejs
```

```
node -v
```

3). Node-red 설치

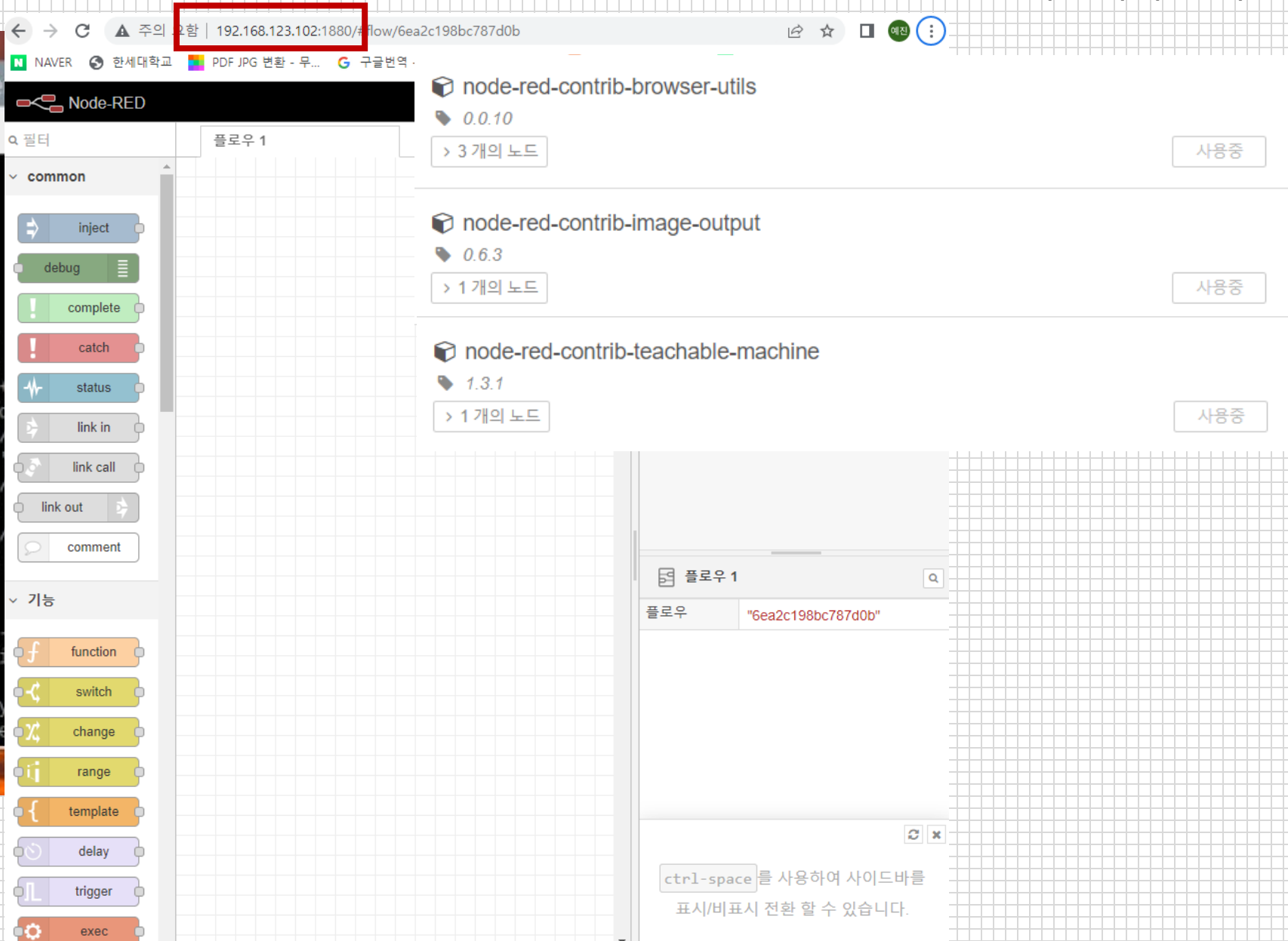
```
bash <(curl -sL https://raw.githubusercontent.com/node-red/linux-installers/master/deb/update-nodejs-and-nodered)
```

```
node-red-start
```

2. node-red-start 후

팔레트에서 설치

```
pi@raspberrypi:~$ node-red
31 Aug 17:16:01 - [info]
Welcome to Node-RED
=====
31 Aug 17:16:01 - [info] Node-RED version:
31 Aug 17:16:01 - [info] Node.js version:
31 Aug 17:16:01 - [info] Linux 5.15.32-v7l
31 Aug 17:16:01 - [info] Loading palette no
31 Aug 17:16:03 - [info] Settings file :
31 Aug 17:16:03 - [info] Context store :
31 Aug 17:16:03 - [info] User directory :
31 Aug 17:16:03 - [warn] Projects disabled
31 Aug 17:16:03 - [info] Flows file :
31 Aug 17:16:03 - [info] Creating new flow
31 Aug 17:16:03 - [warn]
-----
Your flow credentials file is encrypted us
If the system-generated key is lost for any
file will not be recoverable, you will have
```

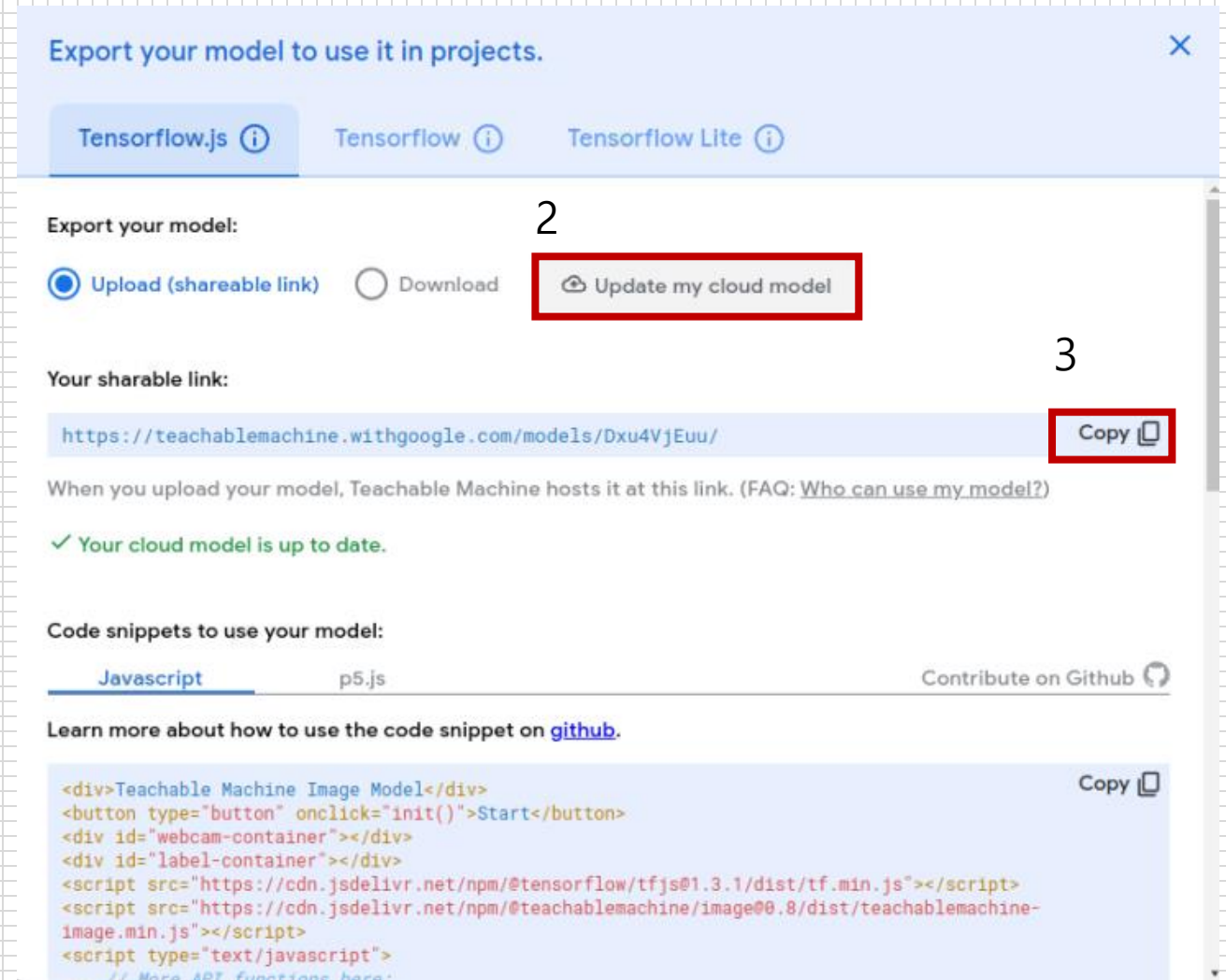
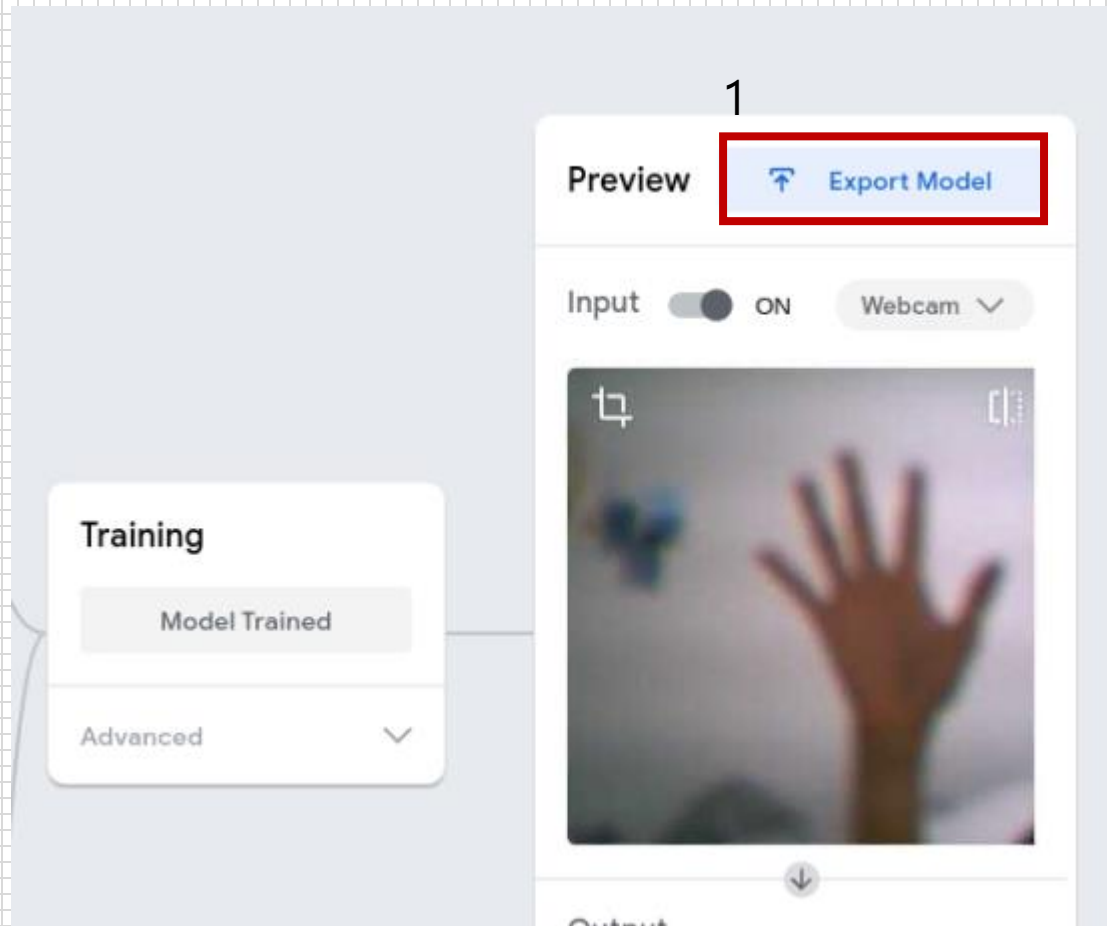


3. 티처블 접속 후 이미지 등록 -> Training하기

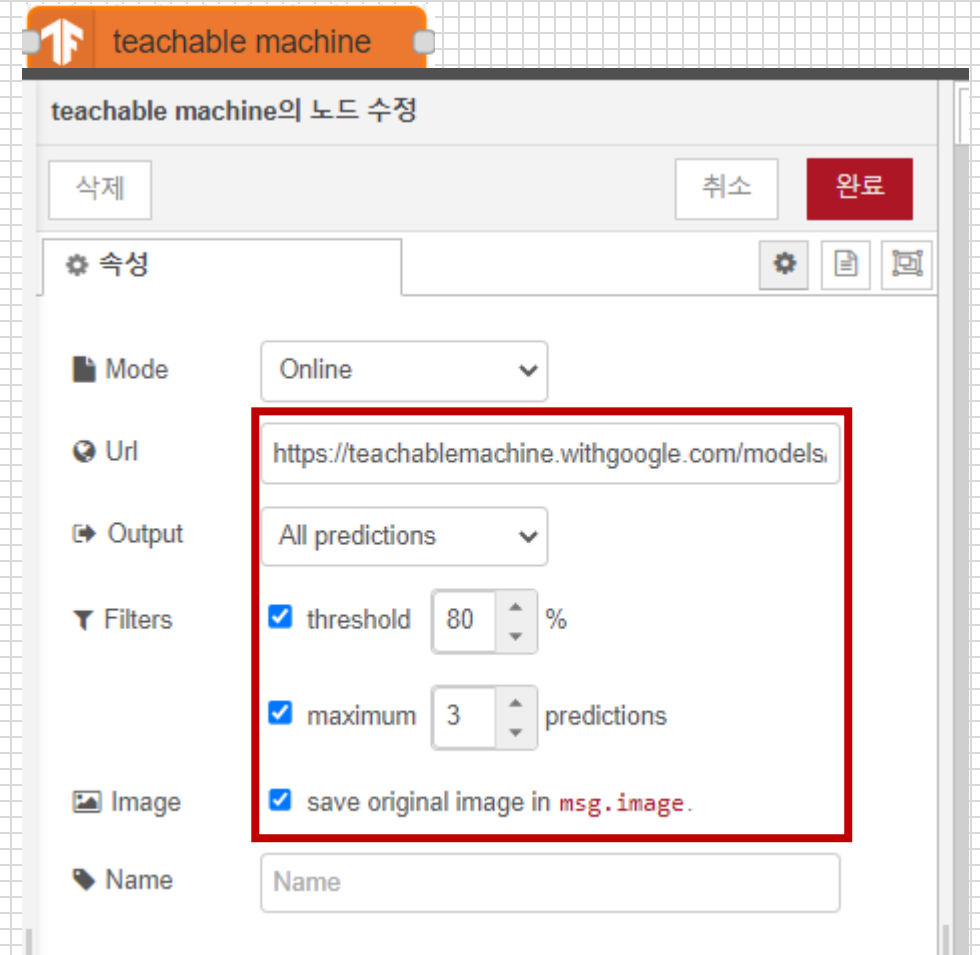
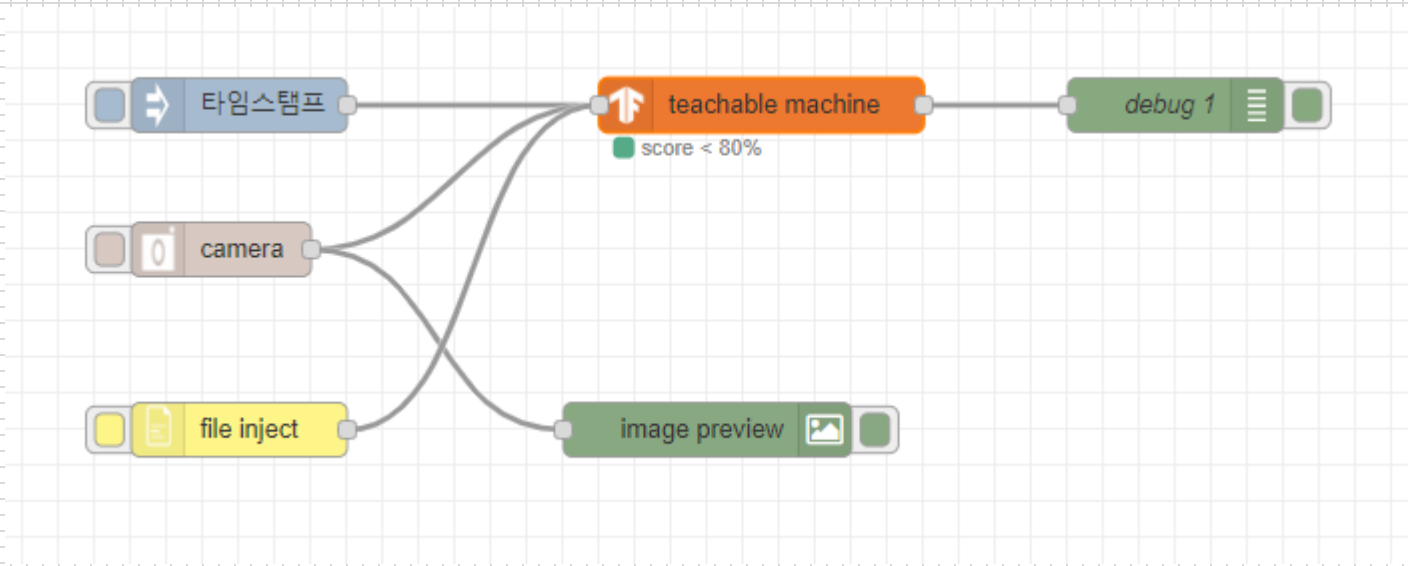
chablemachine.withgoogle.com/train/image

The screenshot displays the Teachable Machine web interface. At the top, the browser address bar shows the URL `teachablemachine.withgoogle.com/train/image`, which is highlighted with a red box and labeled with a '1'. Below the header, the 'Teachable Machine' logo is visible. The main interface is divided into two sections: 'Training' and 'Preview'. In the 'Training' section, there are two class cards. The first card, labeled 'v' in a red box (3), has '6 Image Samples' and a 'Webcam' button highlighted with a red box (2). The second card, labeled 'five' in a red box (3), has '7 Image Samples' and a 'Webcam' button highlighted with a red box (2). A 'Train Model' button in the 'Training' section is highlighted with a red box and labeled with a '4'. The 'Preview' section contains an 'Export Model' button and a message: 'You must train a model on the left before you can preview it here.' At the bottom, there is an 'Add a class' button. The footer shows the language set to 'English' and the version 'release-2-4-5 - 2.4.5#18d7c1'.

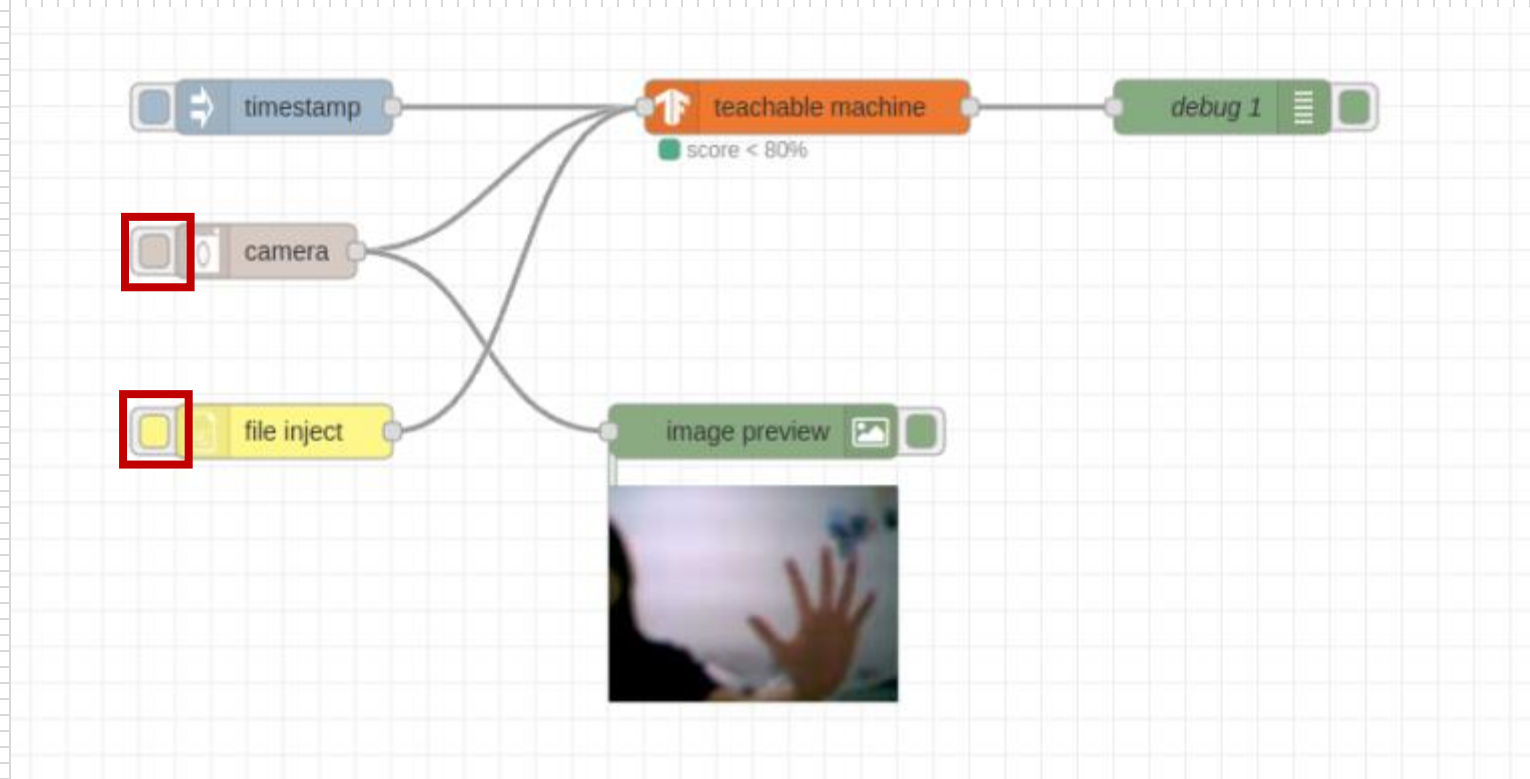
4. 트레이닝 후 'Export Model' 후 클라우드 모델 업데이트 -> URL 복사



5. node-red 접속 후 아래와 같이 생성



6. 카메라, 파일 클릭하여 작동 확인



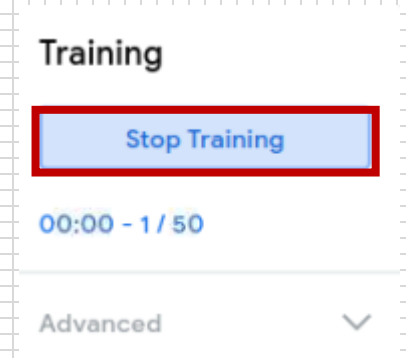
오류 사항

<https://reddb.tistory.com/123>

<https://www.npmjs.com/package/node-red-contrib-browser-utils>

오류 - 1 : 티처블머신에서 트레이닝 10분 넘게 지연되며 1/50에서 넘어가지 않음.

해결 방안 : Training 버튼에 커서를 올려 stop Training 누른 후 학습이 완료 됨.
라즈베리파이가 딜레이가 있어 지연된 것으로 생각함.



->재연 화면

오류 - 2 : 카메라 버튼 클릭 안 됨

해결 방안 : 터미널에서 node.js 제거 후 최신버전으로 재설치 / 초기에는 14버전

1. `sudo apt-get remove nodejs`
2. `sudo curl -sL https://deb.nodesource.com/setup_16.x | sudo -E bash`
3. `node-red -v`로 버전 확인

```
pi@raspberrypi:~ $ node-red -v
19 Sep 20:06:59 - [info]

Welcome to Node-RED
=====

19 Sep 20:06:59 - [info] Node-RED version: v3.0.2
19 Sep 20:06:59 - [info] Node.js version: v16.17.0
19 Sep 20:06:59 - [info] Linux 5.15.61-v7l+ arm LE
19 Sep 20:07:01 - [info] Loading palette nodes
```