

실습 준비

❖ **Vscode 설치** <https://code.visualstudio.com>
오른쪽 상단의 Download, Windows를 눌러 설치 파일 다운로드

❖ **Python 설치** <https://www.python.org/downloads/>
3.8.9 버전

Release version	Release date		Click for more
Python 3.9.5	May 3, 2021	Download	Release Notes
Python 3.8.10	May 3, 2021	Download	Release Notes
Python 3.9.4	April 4, 2021	Download	Release Notes
Python 3.8.9	April 2, 2021	Download	Release Notes
Python 3.9.2	Feb. 19, 2021	Download	Release Notes
Python 3.8.8	Feb. 19, 2021	Download	Release Notes
Python 3.6.13	Feb. 15, 2021	Download	Release Notes

[View older releases](#)

Files

Version	Operating System	Description	MD5 Sum	File Size	GPG
Gzipped source tarball	Source release		41a5eaa15818cee7ea59e578564a2629	23.4 MB	SIG
XZ compressed source tarball	Source release		51b5bbf2ab447e66d15af4883db1c133	17.4 MB	SIG
macOS 64-bit Intel installer	macOS	for macOS 10.9 and later	2323c476134fafa8b462530019f34394	28.5 MB	SIG
Windows installer (64-bit)	Windows	Recommended	f69d9c918a8ad06c71d7f0f26ccfee12	26.9 MB	SIG
Windows installer (32-bit)	Windows		1b5456a52e2017eec31c320f0222d359	25.9 MB	SIG
Windows help file	Windows		678cdc8e46b0b569ab9284be689be807	8.2 MB	SIG
Windows embeddable package (64-bit)	Windows		cff9e470ee6b57c63c16b8a93c586b28	7.8 MB	SIG
Windows embeddable package (32-bit)	Windows		40830c33f775641ccfad5bf17ea3a893	7.0 MB	SIG

추가 작업 선택

수행할 추가 작업을 선택하십시오.

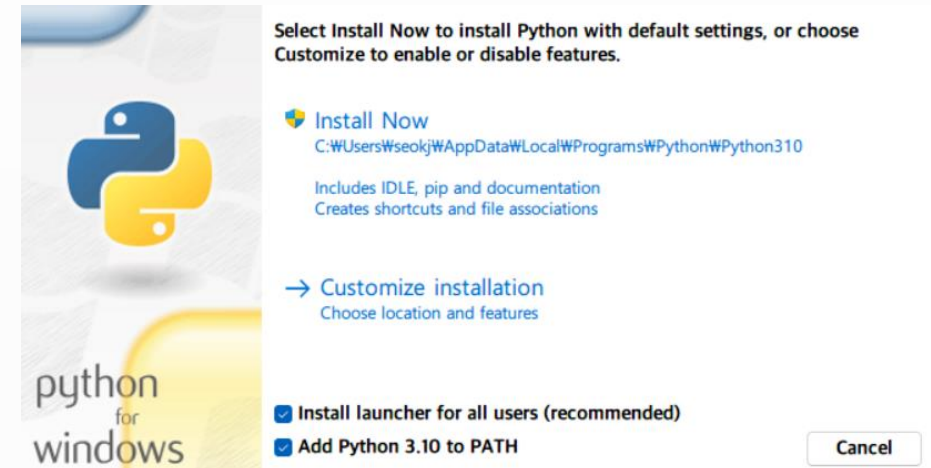
Visual Studio Code 설치 과정에 포함할 추가 작업을 선택한 후, "다음"을 클릭하십시오.

아이콘 추가:

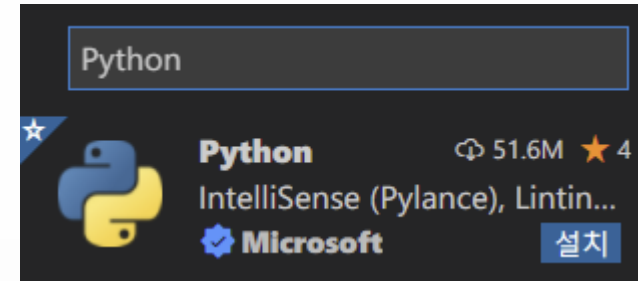
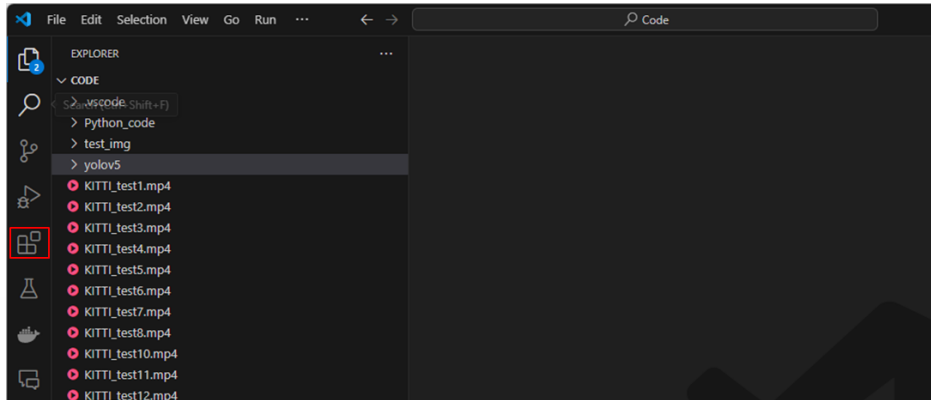
☐ 바탕 화면에 바로가기 만들기(D)

기타:

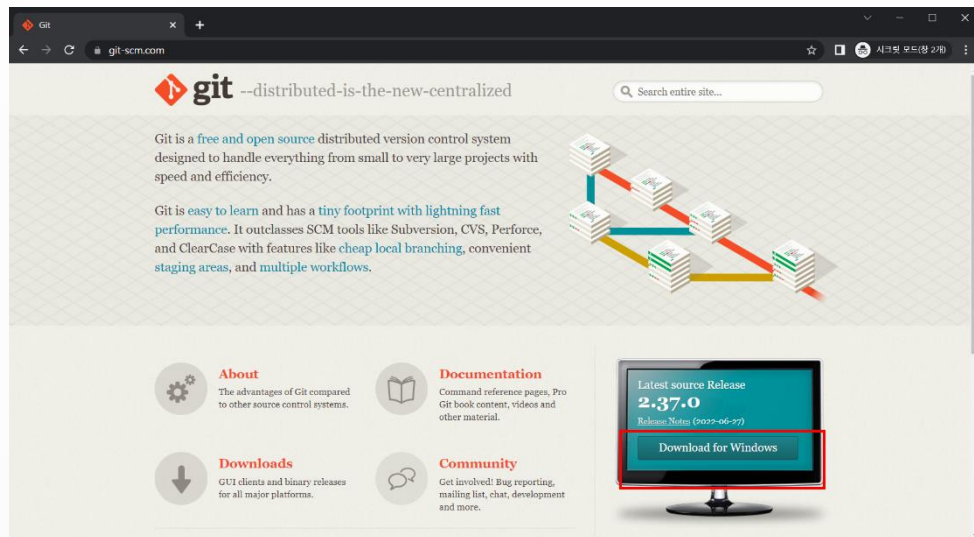
- ☒ "Code(으)로 열기" 작업을 Windows 탐색기 파일의 상황에 맞는 메뉴에 추가
- ☒ "Code(으)로 열기" 작업을 Windows 탐색기 디렉터리의 상황에 맞는 메뉴에 추가
- ☒ Code을(를) 지원되는 파일 형식에 대한 편집기로 등록합니다.
- ☒ PATH에 추가(다시 시작한 후 사용 가능)



❖ Vscode Python Extension 설치



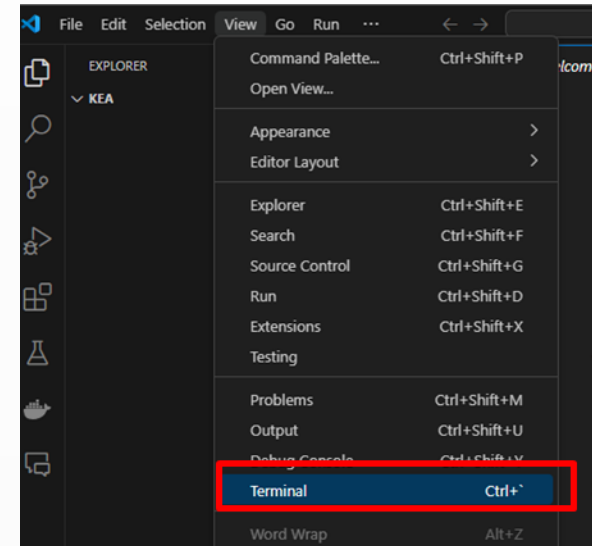
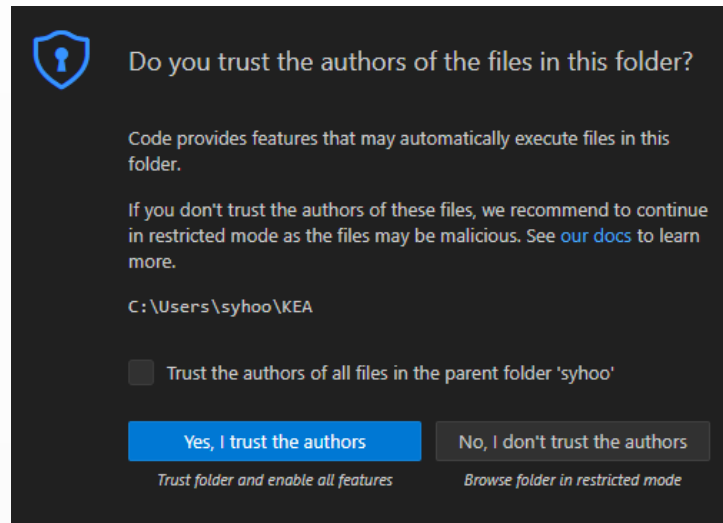
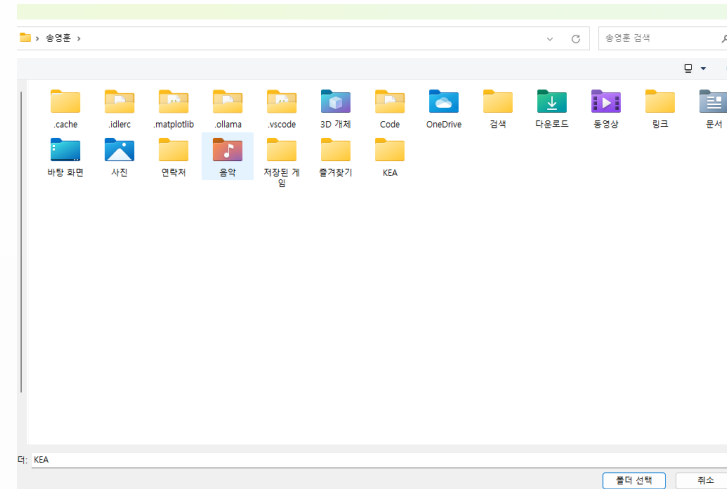
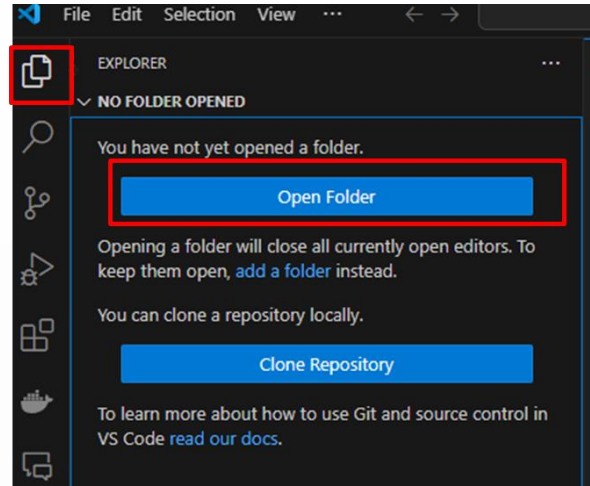
❖ Git 설치 <https://git-scm.com/>



실습 준비

❖설치 확인

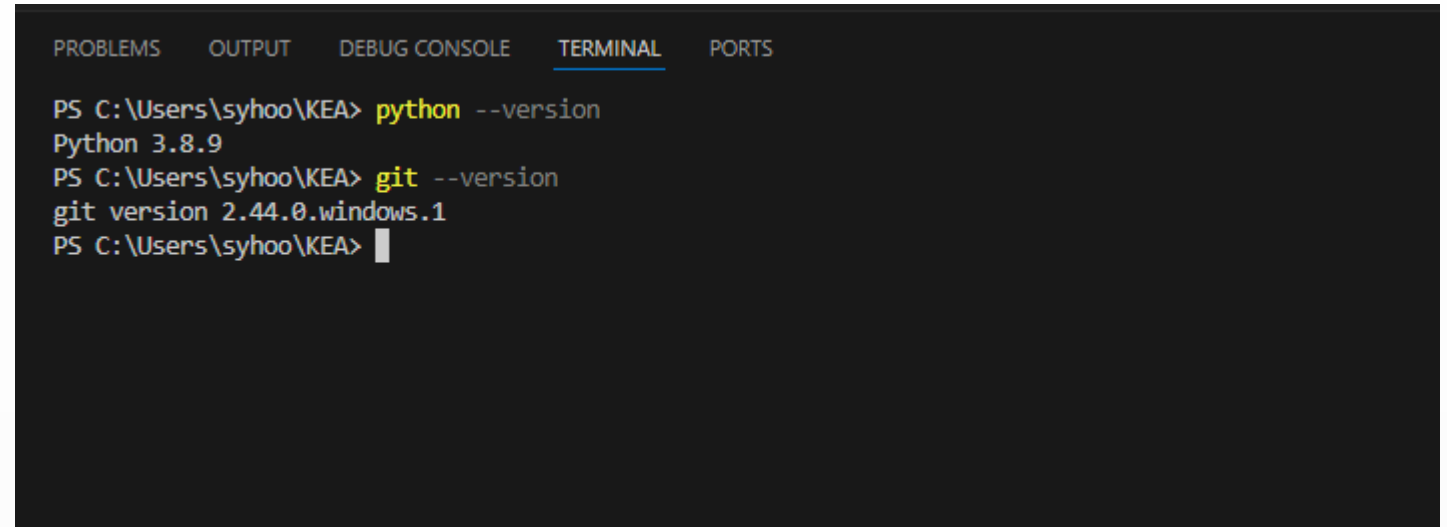
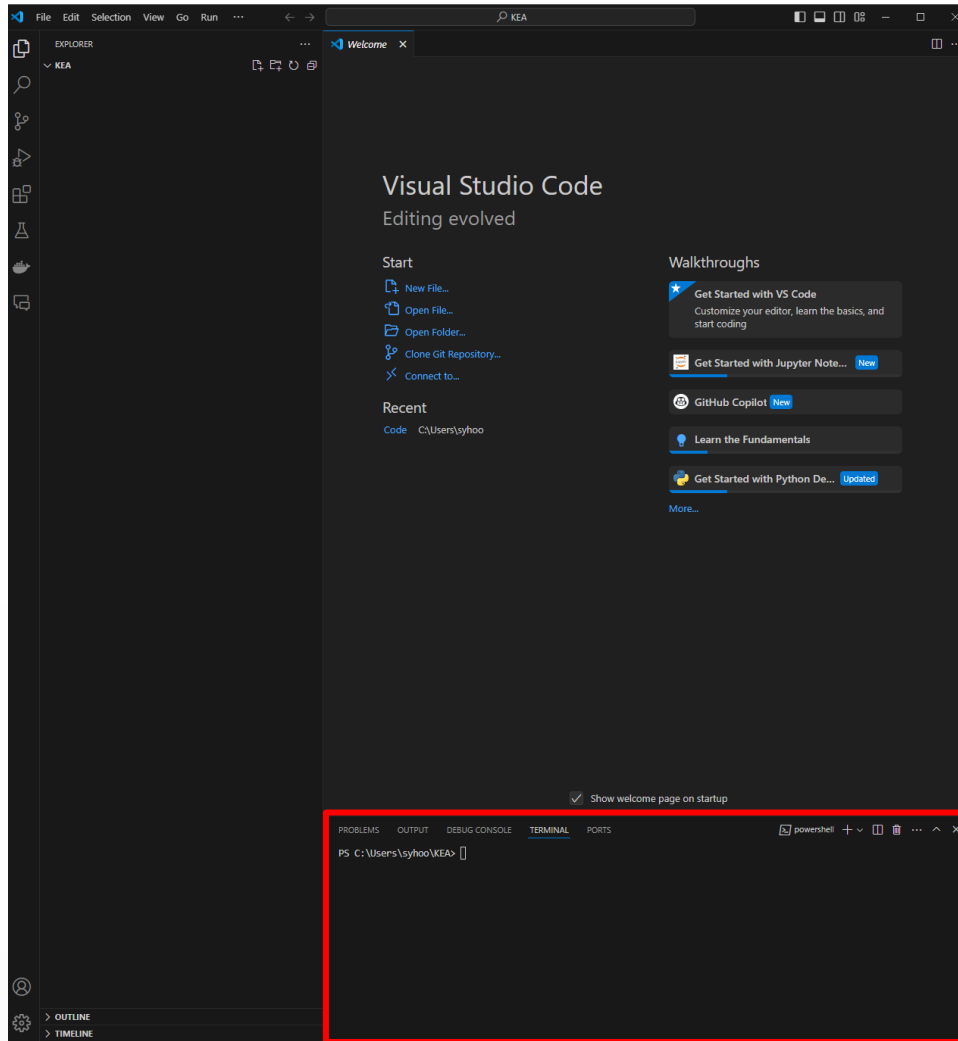
Vscode 실행 -> 탐색기창 왼쪽 최상단으로 이동 -> 폴더 열기 -> 실습 폴더 생성 및 선택 -> View 에 Terminal 실행



실습 준비

❖ 설치 확인

설정한 폴더 경로 및 터미널 실행 확인 -> 터미널에 `python --version`, `git --version` 입력 및 확인



실습 준비

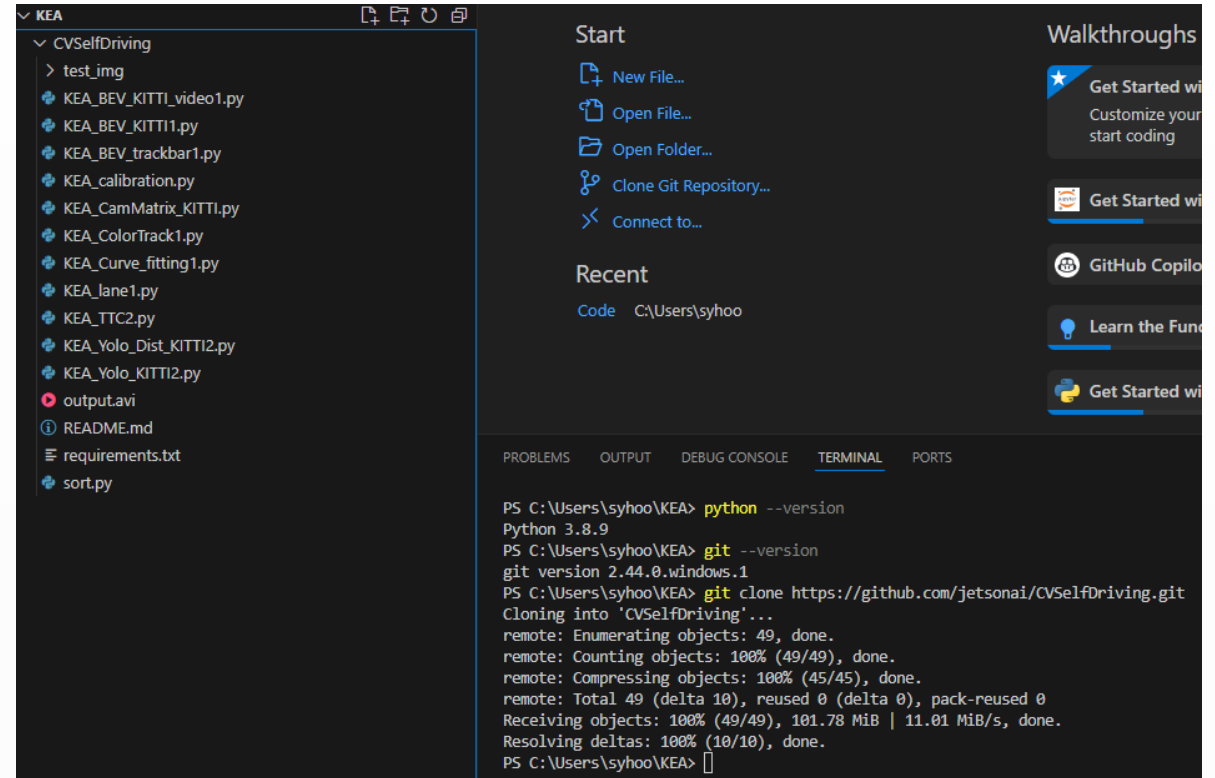
❖ 실습 코드 및 환경 다운로드

<https://github.com/jetsonai/CVSelfDriving.git>

터미널에 `git clone https://github.com/jetsonai/CVSelfDriving.git` 실행
CVSelfDriving 폴더 및 코드 파일 생성 확인

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\syhoo\KEA> python --version
Python 3.8.9
PS C:\Users\syhoo\KEA> git --version
git version 2.44.0.windows.1
PS C:\Users\syhoo\KEA> git clone https://github.com/jetsonai/CVSelfDriving.git
Cloning into 'CVSelfDriving'...
remote: Enumerating objects: 49, done.
remote: Counting objects: 100% (49/49), done.
remote: Compressing objects: 100% (45/45), done.
remote: Total 49 (delta 10), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (49/49), 101.78 MiB | 11.01 MiB/s, done.
Resolving deltas: 100% (10/10), done.
PS C:\Users\syhoo\KEA> 
```



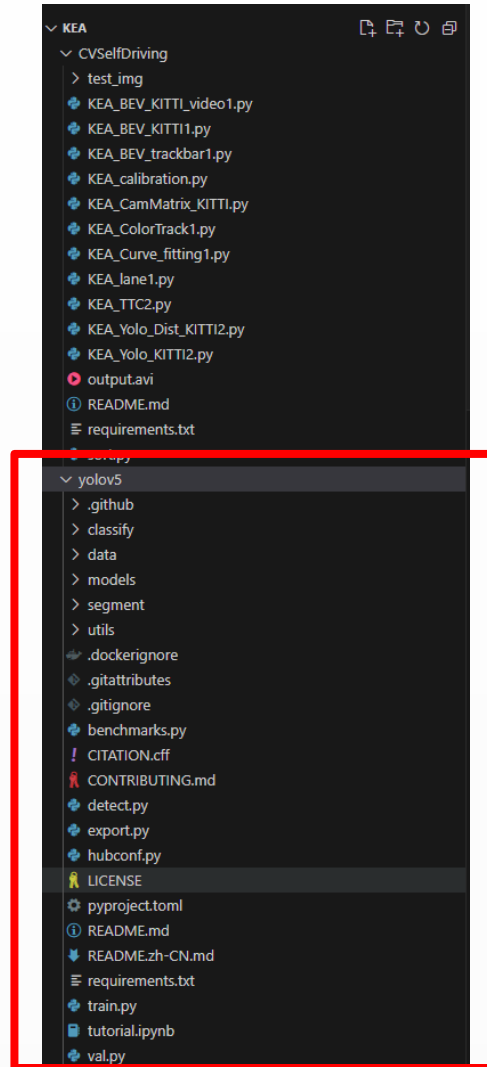
실습 준비

❖ 실습 코드 테스트

터미널에 `git clone https://github.com/ultralytics/yolov5.git` 실행

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\syhoo\KEA> python --version
Python 3.8.9
PS C:\Users\syhoo\KEA> git --version
git version 2.44.0.windows.1
PS C:\Users\syhoo\KEA> git clone https://github.com/jetsonai/CVSelfDriving.git
Cloning into 'CVSelfDriving'...
remote: Enumerating objects: 49, done.
remote: Counting objects: 100% (49/49), done.
remote: Compressing objects: 100% (45/45), done.
remote: Total 49 (delta 10), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (49/49), 101.78 MiB | 11.01 MiB/s, done.
Resolving deltas: 100% (10/10), done.
PS C:\Users\syhoo\KEA> git clone https://github.com/ultralytics/yolov5.git
Cloning into 'yolov5'...
remote: Enumerating objects: 16623, done.
remote: Counting objects: 100% (101/101), done.
remote: Compressing objects: 100% (72/72), done.
remote: Total 16623 (delta 56), reused 62 (delta 29), pack-reused 16522
Receiving objects: 100% (16623/16623), 15.10 MiB | 19.64 MiB/s, done.
Resolving deltas: 100% (11415/11415), done.
PS C:\Users\syhoo\KEA> 
```

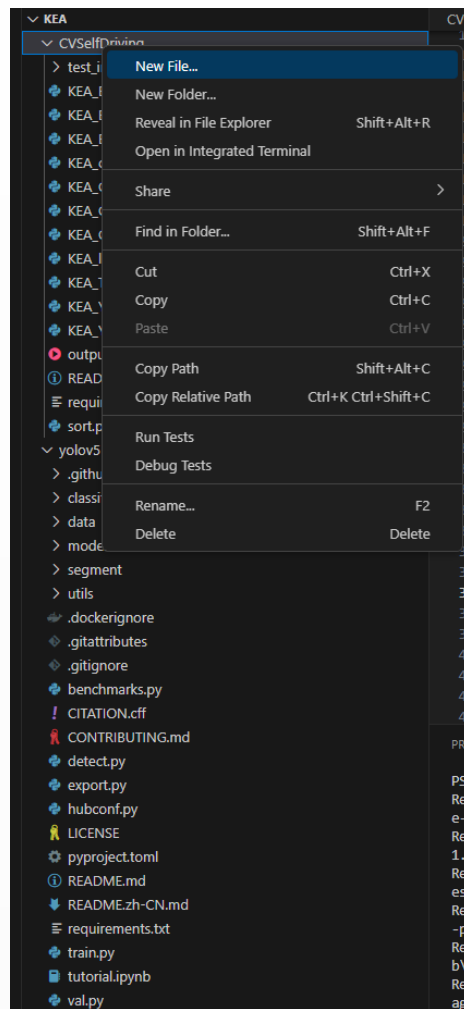


실습 준비

❖ 실습 코드 테스트

터미널에 `cd yolov5` 입력 -> `pip install -r requirements.txt` 입력 -> `pip install scikit-image==0.17.2 filterpy` 입력

```
PS C:\Users\syhoo\KEA> pip install scikit-image==0.17.2 filterpy
Resolving deltas: 100% (10/10), done.
PS C:\Users\syhoo\KEA> git clone https://github.com/ultralytics/yolov5.git
Cloning into 'yolov5'...
remote: Enumerating objects: 16623, done.
remote: Counting objects: 100% (101/101), done.
remote: Compressing objects: 100% (72/72), done.
remote: Total 16623 (delta 56), reused 62 (delta 29), pack-reused 16522
Receiving objects: 100% (16623/16623), 15.10 MiB | 19.64 MiB/s, done.
Resolving deltas: 100% (11415/11415), done.
PS C:\Users\syhoo\KEA> cd yolov5
PS C:\Users\syhoo\KEA\yolov5> pip install -r requirements.txt
Requirement already satisfied: gitpython>=3.1.30 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 5)) (3.1.45)
Requirement already satisfied: matplotlib>=3.3 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 6)) (3.7.5)
Requirement already satisfied: numpy>=1.23.5 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 7)) (1.24.4)
Requirement already satisfied: opencv-python>=4.1.1 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 8)) (4.9.0.80)
Requirement already satisfied: pillow>=10.3.0 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 9)) (10.3.0)
Requirement already satisfied: psutil in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 10)) (5.9.8)
Requirement already satisfied: PyYAML>=5.3.1 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 11)) (6.0.1)
Requirement already satisfied: requests>=2.23.0 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 12)) (2.31.0)
Requirement already satisfied: scipy>=1.4.1 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 13)) (1.10.1)
Requirement already satisfied: thop>=0.1.1 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 14)) (0.1.1.post2209072238)
Requirement already satisfied: torch>=1.8.0 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 15)) (1.9.0+cu111)
Requirement already satisfied: torchvision>=0.9.0 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 16)) (0.10.0+cu111)
Requirement already satisfied: tqdm>=4.64.0 in c:\users\syhoo\appdata\local\programs\python\python38\lib\site-packages (from -r requirements.txt (line 17)) (4.66.2)
```



실습 준비

❖ 실습 코드 테스트

yolotest.py 생성



```
File Edit Selection View Go Run ... KEA

EXPLORER
  KEA
    CVSelfDriving
      > __pycache__
      > test_img
      KEA_BEV_KITTI_video1.py
      KEA_BEV_KITTI1.py
      KEA_BEV_trackbar1.py
      KEA_calibration.py
      KEA_CamMatrix_KITTI1.py
      KEA_ColorTrack1.py
      KEA_Curve_fitting1.py
      KEA_lane1.py
      KEA_TTC2.py
      KEA_Yolo_Dist_KITTI2.py
      KEA_Yolo_KITTI2.py M
      output.avi
      README.md
      requirements.txt
      sort.py
      yolotest.py U
    yolov5
      > __pycache__
      > .github
      > classify
      > data
      > models
      > segment
      > utils
      .dockerignore
      .gitattributes
      .gitignore
      benchmarks.py
      CITATION.cff
      CONTRIBUTING.md
      detect.py
      export.py

yolotest.py U
  1 import torch
  2 import numpy as np
  3 import math
  4 import cv2
  5 import matplotlib.pyplot as plt
  6 from sort import *
  7
  8 # Model
  9 model = torch.hub.load('C:/Users/syhoo/KEA/yolov5', 'yolov5x', 'yolov5x.pt', source='local')
 10 vid = cv2.VideoCapture('C:/Users/syhoo/KEA/CVSelfDriving/test_img/video/KITTI_test25.mp4')
 11 mot_tracker = Sort()
 12 colours = np.random.rand(32, 3)*255
 13
 14 while(True):
 15     ret, image_show = vid.read()
 16     preds = model(image_show)
 17     detections = preds.pred[0].cpu().numpy()
 18
 19     detections = detections[(detections[:, 5] >= 0) & (detections[:, 5] <= 7)]
 20
 21     track_bbs_ids = mot_tracker.update(detections)
 22
 23     for j in range(len(track_bbs_ids.tolist())):
 24         coords = track_bbs_ids.tolist()[j]
 25         x1, y1, x2, y2 = map(int, coords[:4])
 26         name_idx = int(coords[4])
 27         name = "ID : {}".format(str(name_idx))
 28         color = colours[name_idx % len(colours)]
 29         cv2.rectangle(image_show, (x1,y1), (x2,y2), color, 2)
 30         cv2.putText(image_show, name, (x1,y1-10), cv2.FONT_HERSHEY_SIMPLEX, 0.9, color, 2)
 31
 32     cv2.imshow('Image', image_show)
 33     if cv2.waitKey(1) & 0xFF == ord('q'):
 34         break
 35
 36 vid.release()
 37 cv2.destroyAllWindows()
```