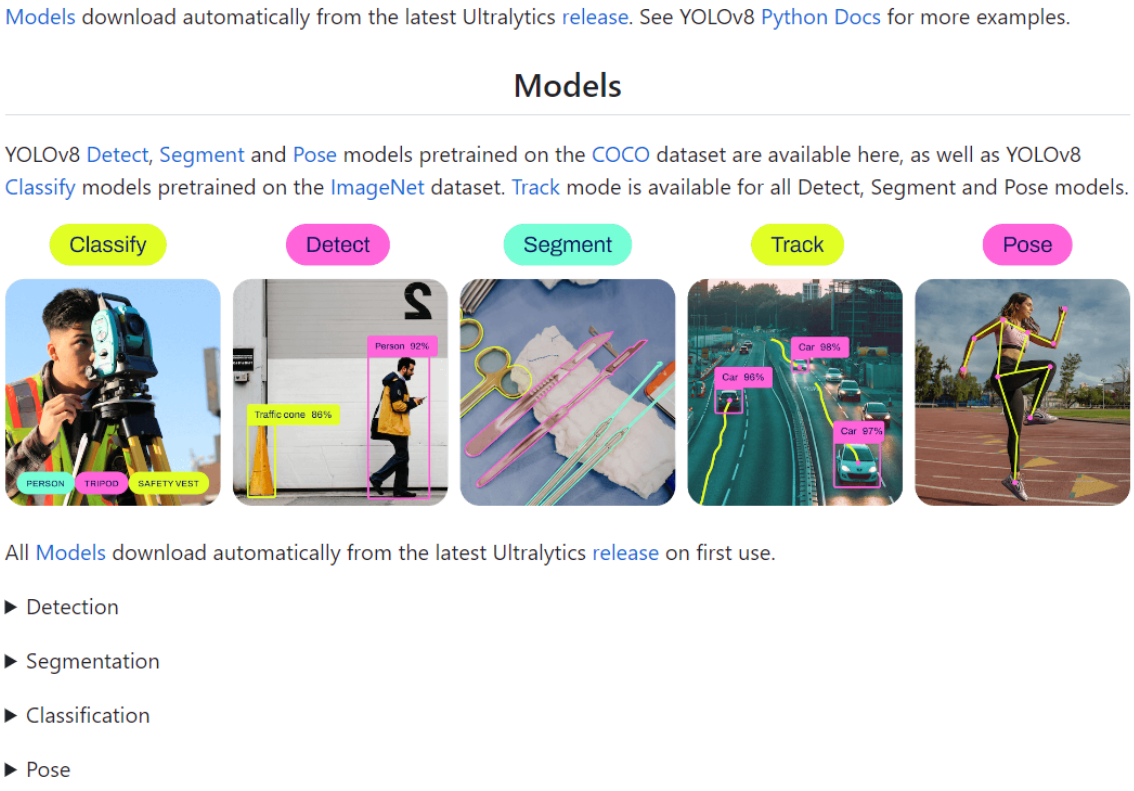
Smoke & Fire 모델 학습 시키기

https://github.com/ultralytics/ultralytics

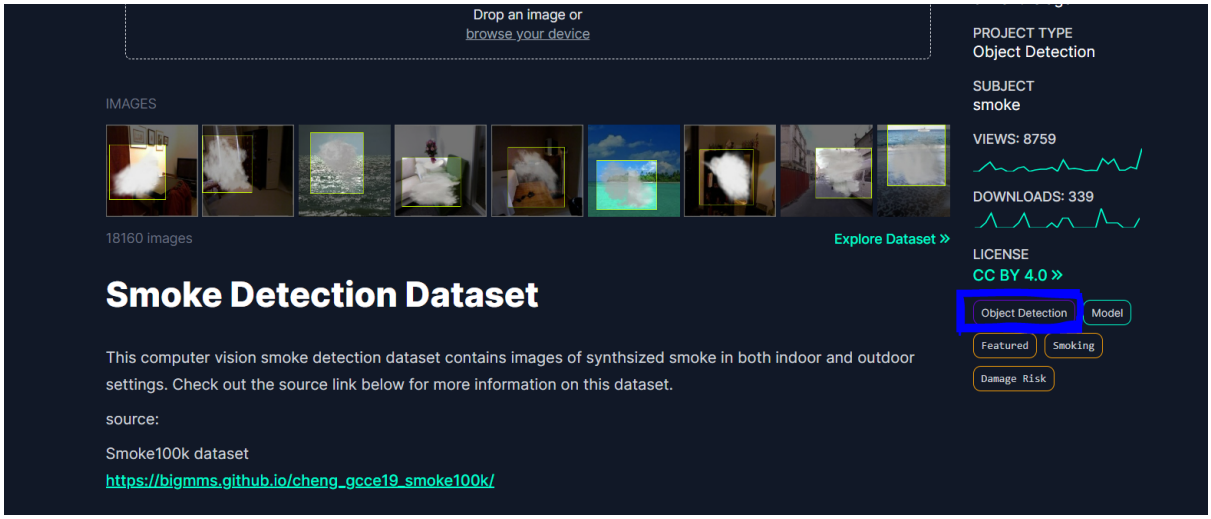
YOLOv8 학습 시 알아야할 것

YOLO 에는 4가지 분야가 존재




```
    'as an example.\nSee https://docs.ultralytics.com/tasks/segment/ for help.') from e
TypeError: ERROR ❌ segment dataset incorrectly formatted or not a segment dataset.
This error can occur when incorrectly training a 'segment' model on a 'detect' dataset, i.e. 'yolo train model=yolov8n-seg.pt data=coco128.yaml'.
Verify your dataset is a correctly formatted 'segment' dataset using 'data=coco128-seg.yaml' as an example.
See https://docs.ultralytics.com/tasks/segment/ for help.
PS C:\Users\SSAFY\Desktop\firesmoke> & C:/Python37/python.exe c:/Users/SSAFY/Desktop/firesmoke/firesmoke.py
<class 'dict'> 80
```

위의 에러가 발생했던 이유는 현재 내가 가져온 데이터셋은 Object Detect 인데



작성한 코드는 segmentation 을 하라는 코드를 썼기 때문이다.

작성 코드

```
from ultralytics import YOLO

def run():
    model = YOLO('yolov8n-seg.pt')  # load a pretrained YOLOv8n segmentation model
    print(type(model.names), len(model.names))
    print(model.names)

    model.train(data='C:/Users/SSAFY/Desktop/firesmoke/data.yaml', epochs=30, batch=8)

    results = model.predict(source = "0", show=True)

    print(results)

if __name__ == '__main__':
    run()
```

▼ Detection

See Detection Docs for usage examples with these models.

Model	size (pixels)	mAP^{val} 50-95	Speed CPU ONNX (ms)	Speed A100 TensorRT (ms)	params (M)	FLOPs (B)
YOLOv8n	640	37.3	80.4	0.99	3.2	8.7
YOLOv8s	640	44.9	128.4	1.20	11.2	28.6
YOLOv8m	640	50.2	234.7	1.83	25.9	78.9
YOLOv8l	640	52.9	375.2	2.39	43.7	165.2
YOLOv8x	640	53.9	479.1	3.53	68.2	257.8

▼ Segmentation

See Segmentation Docs for usage examples with these models.

Model	size (pixels)	mAP^{box} 50-95	mAP^{mask} 50-95	Speed CPU ONNX (ms)	Speed A100 TensorRT (ms)	params (M)	FLOPs (B)
YOLOv8n-seg	640	36.7	30.5	96.1	1.21	3.4	12.6
YOLOv8s-seg	640	44.6	36.8	155.7	1.47	11.8	42.6
YOLOv8m-seg	640	49.9	40.8	317.0	2.18	27.3	110.2
YOLOv8l-seg	640	52.3	42.6	572.4	2.79	46.0	220.5
YOLOv8x-seg	640	53.4	43.4	712.1	4.02	71.8	344.1

따라서 가져온 데이터셋의 종류에 맞추어 코드를 바꿔주면 된다.

```
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def run():
    model = YOLO('yolov8n.pt')  # load a pretrained YOLOv8n segmentation model
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    print(model.names)

    model.train(data='C:/Users/SSAFY/Desktop/firesmoke/data.yaml', epochs=30, batch=8)

    results = model.predict(source = "0", show=True)
```

```
    print(results)

if __name__ == '__main__':
    run()
```

```
Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
 1/30      1.14G      1.248      2.092      1.632         19        640: 100%|██████████| 856/856 [03:21<00:00,  4.25it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:21<00:00,  5.61it/s]
             all       1945       2099      0.465      0.406      0.255      0.169

Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
 2/30      1.21G      1.177       1.49      1.547         11        640: 100%|██████████| 856/856 [03:17<00:00,  4.33it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:21<00:00,  5.72it/s]
             all       1945       2099      0.702      0.391      0.236       0.16

Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
 3/30      1.19G       1.16      1.379      1.526          6        640: 100%|██████████| 856/856 [03:21<00:00,  4.25it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:23<00:00,  5.09it/s]
             all       1945       2099      0.498      0.507      0.269      0.182

Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
 4/30      1.19G      1.136      1.311       1.51         12        640: 100%|██████████| 856/856 [03:20<00:00,  4.27it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:26<00:00,  4.62it/s]
             all       1945       2099      0.708      0.423      0.266      0.188

Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
 5/30      1.16G      1.152      1.308      1.518         18        640:  16%|▉         | 133/856 [00:31<02:49,  4.27it/s]
```

```
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:23<00:00,  5.18it/s]
             all       1945       2099       0.37      0.544      0.316      0.257

Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
24/30      1.22G     0.6705     0.8552      1.247          4        640: 100%|██████████| 856/856 [03:17<00:00,  4.33it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:21<00:00,  5.61it/s]
             all       1945       2099      0.335      0.564      0.314       0.26

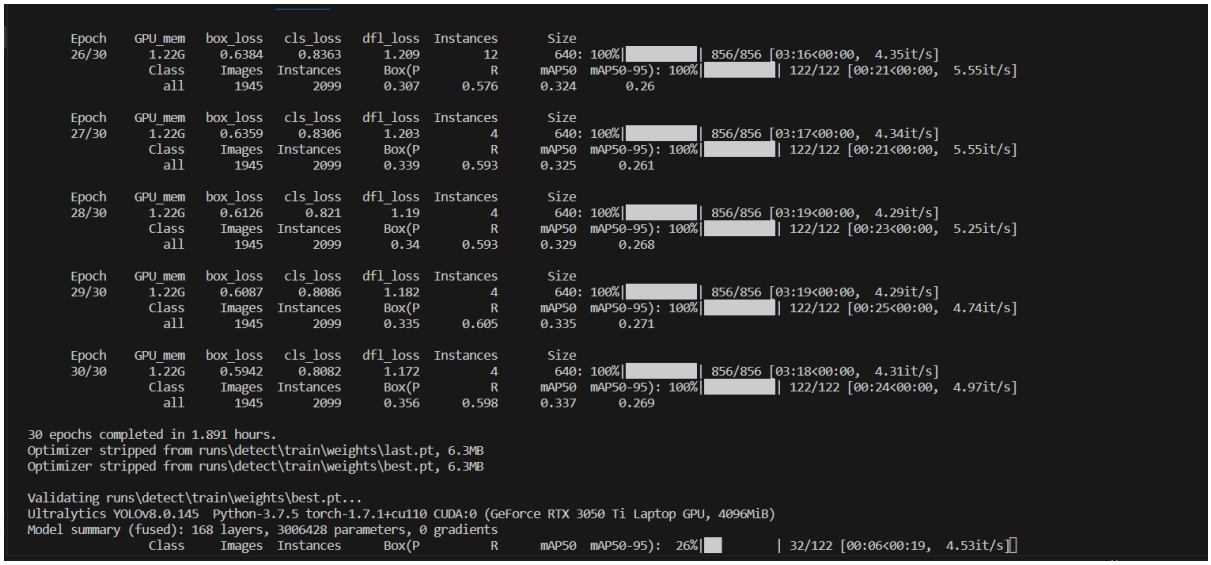
Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
25/30      1.22G     0.6514     0.8375      1.223          4        640: 100%|██████████| 856/856 [03:16<00:00,  4.35it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:22<00:00,  5.53it/s]
             all       1945       2099      0.314      0.603      0.311      0.252

Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
26/30      1.22G     0.6384     0.8363      1.209         12        640: 100%|██████████| 856/856 [03:16<00:00,  4.35it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:21<00:00,  5.55it/s]
             all       1945       2099      0.307      0.576      0.324       0.26

Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
27/30      1.22G     0.6359     0.8306      1.203          4        640: 100%|██████████| 856/856 [03:17<00:00,  4.34it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:21<00:00,  5.55it/s]
             all       1945       2099      0.339      0.593      0.325      0.261

Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
28/30      1.22G     0.6126      0.821       1.19          4        640: 100%|██████████| 856/856 [03:19<00:00,  4.29it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 122/122 [00:23<00:00,  5.25it/s]
             all       1945       2099       0.34      0.593      0.329      0.268

Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
29/30      1.22G     0.6087     0.8086      1.182          4        640: 100%|██████████| 856/856 [03:19<00:00,  4.29it/s]
           Class     Images  Instances      Box(P          R      mAP50  mAP50-95):   4%|▍         | 5/122 [00:01<00:26,  4.48it/s]
```

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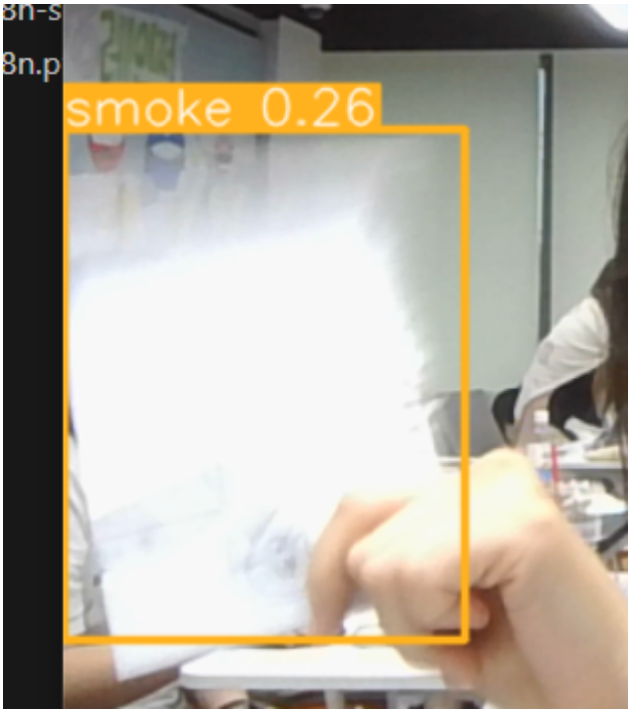
```

학습완료 후 테스트 함

결과


8n-s
8n.p
smoke 0.26


smoke 0.28