

```
!git clone https://github.com/Arijit1080/Licence-Plate-Detection-using-YOLO-V8.git
```

```
Cloning into 'Licence-Plate-Detection-using-YOLO-V8'...
remote: Enumerating objects: 133, done.
remote: Counting objects: 100% (16/16), done.
remote: Compressing objects: 100% (13/13), done.
remote: Total 133 (delta 4), reused 8 (delta 3), pack-reused 117
Receiving objects: 100% (133/133), 14.73 MiB | 7.66 MiB/s, done.
Resolving deltas: 100% (34/34), done.
```

```
cd /content/Licence-Plate-Detection-using-YOLO-V8
```

```
/content/Licence-Plate-Detection-using-YOLO-V8
```

```
'''!pip install roboflow
```

```
from roboflow import Roboflow
rf = Roboflow(api_key="xxx") #Put your API Key here
project = rf.workspace("snu-i6ovv").project("license-plate-detector-ogxxg")
dataset = project.version(1).download("yolov8")'''
```

```
!pip install roboflow
```

```
from roboflow import Roboflow
rf = Roboflow(api_key="2hHuwfa047kEXrNNPJEP")
project = rf.workspace("mochoye").project("license-plate-detector-ogxxg")
version = project.version(2)
dataset = version.download("yolov8")
```

```

Collecting roboflow
  Downloading roboflow-1.1.21-py3-none-any.whl (70 kB)
    70.2/70.2 kB 2.7 MB/s eta 0:00:00
Collecting certifi==2023.7.22 (from roboflow)
  Downloading certifi-2023.7.22-py3-none-any.whl (158 kB)
    158.3/158.3 kB 8.6 MB/s eta 0:00:00
Collecting chardet==4.0.0 (from roboflow)
  Downloading chardet-4.0.0-py2.py3-none-any.whl (178 kB)
    178.7/178.7 kB 10.1 MB/s eta 0:00:00
Collecting cycler==0.10.0 (from roboflow)
  Downloading cycler-0.10.0-py2.py3-none-any.whl (6.5 kB)
Collecting idna==2.10 (from roboflow)
  Downloading idna-2.10-py2.py3-none-any.whl (58 kB)
    58.8/58.8 kB 9.2 MB/s eta 0:00:00
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.10/dist-packages (from roboflow) (1.4.5)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-packages (from roboflow) (3.7.1)
Requirement already satisfied: numpy>=1.18.5 in /usr/local/lib/python3.10/dist-packages (from roboflow) (1.25.2)
Collecting opencv-python-headless==4.8.0.74 (from roboflow)
  Downloading opencv_python_headless-4.8.0.74-cp37-abi3-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (49.1 MB)
    49.1/49.1 MB 11.1 MB/s eta 0:00:00
Requirement already satisfied: Pillow>=7.1.2 in /usr/local/lib/python3.10/dist-packages (from roboflow) (9.4.0)
Requirement already satisfied: python-dateutil in /usr/local/lib/python3.10/dist-packages (from roboflow) (2.8.2)
Collecting python-dotenv (from roboflow)
  Downloading python_dotenv-1.0.1-py3-none-any.whl (19 kB)
Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from roboflow) (2.31.0)
Requirement already satisfied: six in /usr/local/lib/python3.10/dist-packages (from roboflow) (1.16.0)
Collecting supervision (from roboflow)
  Downloading supervision-0.18.0-py3-none-any.whl (86 kB)
    86.7/86.7 kB 13.5 MB/s eta 0:00:00
Requirement already satisfied: urllib3>=1.26.6 in /usr/local/lib/python3.10/dist-packages (from roboflow) (2.0.7)
Requirement already satisfied: tqdm>=4.41.0 in /usr/local/lib/python3.10/dist-packages (from roboflow) (4.66.2)
Requirement already satisfied: PyYAML>=5.3.1 in /usr/local/lib/python3.10/dist-packages (from roboflow) (6.0.1)
Collecting requests-toolbelt (from roboflow)
  Downloading requests_toolbelt-1.0.0-py2.py3-none-any.whl (54 kB)
    54.5/54.5 kB 7.3 MB/s eta 0:00:00
Collecting python-magic (from roboflow)
  Downloading python_magic-0.4.27-py2.py3-none-any.whl (13 kB)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow) (1.2.0)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow) (4.49.0)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow) (23.2)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow) (3.1.1)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests->roboflow) (3.3.2)
Requirement already satisfied: defusedxml<0.8.0,>=0.7.1 in /usr/local/lib/python3.10/dist-packages (from supervision->roboflow) (0.7.1)
Requirement already satisfied: scipy<2.0.0,>=1.10.0 in /usr/local/lib/python3.10/dist-packages (from supervision->roboflow) (1.11.4)
Installing collected packages: python-magic, python-dotenv, opencv-python-headless, idna, cycler, chardet, certifi, supervision, request
  Attempting uninstall: opencv-python-headless
    Found existing installation: opencv-python-headless 4.9.0.80
    Uninstalling opencv-python-headless-4.9.0.80:
      Successfully uninstalled opencv-python-headless-4.9.0.80
  Attempting uninstall: idna
    Found existing installation: idna 3.6
    Uninstalling idna-3.6:
      Successfully uninstalled idna-3.6
  Attempting uninstall: cycler
    Found existing installation: cycler 0.12.1
    Uninstalling cycler-0.12.1:
      Successfully uninstalled cycler-0.12.1
  Attempting uninstall: chardet
!pip install -r requirements.txt

```

```
Collecting ultralytics==8.0.3 (from -r requirements.txt (line 4))
  Downloading ultralytics-8.0.3-py3-none-any.whl (247 kB)
    247.5/247.5 kB 5.6 MB/s eta 0:00:00
Collecting hydra-core>=1.2.0 (from -r requirements.txt (line 5))
  Downloading hydra_core-1.3.2-py3-none-any.whl (154 kB)
    154.5/154.5 kB 11.2 MB/s eta 0:00:00
Requirement already satisfied: matplotlib>=3.2.2 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 6)) (3.7.1)
Requirement already satisfied: numpy>=1.18.5 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 7)) (1.25.2)
Requirement already satisfied: opencv-python>=4.1.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 8)) (4.8.
Requirement already satisfied: Pillow>=7.1.2 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 9)) (9.4.0)
Requirement already satisfied: PyYAML>=5.3.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 10)) (6.0.1)
Requirement already satisfied: requests>=2.23.0 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 11)) (2.31.0)
Requirement already satisfied: scipy>=1.4.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 12)) (1.11.4)
Requirement already satisfied: torch>=1.7.0 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 13)) (2.1.0+cu121)
Requirement already satisfied: torchvision>=0.8.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 14)) (0.16.
Requirement already satisfied: tqdm>=4.64.0 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 15)) (4.66.2)
Requirement already satisfied: tensorboard>=2.4.1 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 18)) (2.15.
Requirement already satisfied: pandas>=1.1.4 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 22)) (1.5.3)
Requirement already satisfied: seaborn>=0.11.0 in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 23)) (0.13.1)
Requirement already satisfied: ipython in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 26)) (7.34.0)
Requirement already satisfied: psutil in /usr/local/lib/python3.10/dist-packages (from -r requirements.txt (line 27)) (5.9.5)
Collecting thop>=0.1.1 (from -r requirements.txt (line 28))
  Downloading thop-0.1.1.post2209072238-py3-none-any.whl (15 kB)
Collecting GitPython>=3.1.24 (from -r requirements.txt (line 31))
  Downloading GitPython-3.1.42-py3-none-any.whl (195 kB)
    195.4/195.4 kB 11.1 MB/s eta 0:00:00
Collecting omegaconf<2.4,>=2.2 (from hydra-core>=1.2.0->-r requirements.txt (line 5))
  Downloading omegaconf-2.3.0-py3-none-any.whl (79 kB)
    79.5/79.5 kB 11.0 MB/s eta 0:00:00
Collecting antlr4-python3-runtime==4.9.* (from hydra-core>=1.2.0->-r requirements.txt (line 5))
  Downloading antlr4-python3-runtime-4.9.3.tar.gz (117 kB)
    117.0/117.0 kB 8.6 MB/s eta 0:00:00
Preparing metadata (setup.py) ... done
Requirement already satisfied: packaging in /usr/local/lib/python3.10/dist-packages (from hydra-core>=1.2.0->-r requirements.txt (line 5)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.2.2->-r requirements.txt
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.2.2->-r requirements.txt (lin
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.2.2->-r requirements.txt
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.2.2->-r requirements.txt
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.2.2->-r requirements.txt
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=3.2.2->-r requirements
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests>=2.23.0->-r requirement
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests>=2.23.0->-r requirements.txt (line
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests>=2.23.0->-r requirements.txt
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests>=2.23.0->-r requirements.txt
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (line 13)) (3
Requirement already satisfied: typing-extensions in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (lin
Requirement already satisfied: sympy in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (line 13)) (1.12
Requirement already satisfied: networkx in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (line 13)) (3
Requirement already satisfied: jinja2 in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (line 13)) (3.1
Requirement already satisfied: fsspec in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (line 13)) (202
Requirement already satisfied: triton==2.1.0 in /usr/local/lib/python3.10/dist-packages (from torch>=1.7.0->-r requirements.txt (line 13)
Requirement already satisfied: absl-py>=0.4 in /usr/local/lib/python3.10/dist-packages (from tensorboard>=2.4.1->-r requirements.txt (li
Requirement already satisfied: grpcio>=1.48.2 in /usr/local/lib/python3.10/dist-packages (from tensorboard>=2.4.1->-r requirements.txt (
Requirement already satisfied: google-auth<3,>=1.6.3 in /usr/local/lib/python3.10/dist-packages (from tensorboard>=2.4.1->-r requirement
Requirement already satisfied: google-auth-oauthlib<2,>=0.5 in /usr/local/lib/python3.10/dist-packages (from tensorboard>=2.4.1->-r requ
Requirement already satisfied: markdown>=2.6.8 in /usr/local/lib/python3.10/dist-packages (from tensorboard>=2.4.1->-r requirements.txt
Requirement already satisfied: protobuf!=4.24.0,>=3.19.6 in /usr/local/lib/python3.10/dist-packages (from tensorboard>=2.4.1->-r require
```

```
!python /content/Licence-Plate-Detection-using-YOLO-V8/ultralytics/yolo/v8/detect/train.py model=yolov8n.pt data=/content/Licence-Plate-Dete
```

```
Downloading https://github.com/ultralytics/assets/releases/download/v0.0.0/yolov8n.pt to yolov8n.pt...
100% 6.23M/6.23M [00:00<00:00, 124MB/s]
```

```
yolo/engine/trainer: task=detect, mode=train, model=yolov8n.pt, data=/content/Licence-Plate-Detection-using-YOLO-V8/Licence-Plate-Dete
Ultralytics YOLOv8.0.3 Python-3.10.12 torch-2.1.0+cu121 CUDA:0 (Tesla T4, 15102MiB)
```

```
Downloading https://ultralytics.com/assets/Arial.ttf to /root/.config/Ultralytics/Arial.ttf...
100% 755k/755k [00:00<00:00, 21.2MB/s]
```

```
2024-03-04 15:05:43.046174: E external/local_xla/xla/stream_executor/cuda/cuda_dnn.cc:9261] Unable to register cuDNN factory: Attempti
2024-03-04 15:05:43.046239: E external/local_xla/xla/stream_executor/cuda/cuda_fft.cc:607] Unable to register cuFFT factory: Attemptir
2024-03-04 15:05:43.048179: E external/local_xla/xla/stream_executor/cuda/cuda_blas.cc:1515] Unable to register cuBLAS factory: Attempt
2024-03-04 15:05:45.217628: W tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not find TensorRT
Overriding model.yaml nc=80 with nc=1
```

	from	n	params	module	arguments
0	-1	1	464	ultralytics.nn.modules.Conv	[3, 16, 3, 2]
1	-1	1	4672	ultralytics.nn.modules.Conv	[16, 32, 3, 2]
2	-1	1	7360	ultralytics.nn.modules.C2f	[32, 32, 1, True]
3	-1	1	18560	ultralytics.nn.modules.Conv	[32, 64, 3, 2]
4	-1	2	49664	ultralytics.nn.modules.C2f	[64, 64, 2, True]
5	-1	1	73984	ultralytics.nn.modules.Conv	[64, 128, 3, 2]
6	-1	2	197632	ultralytics.nn.modules.C2f	[128, 128, 2, True]
7	-1	1	295424	ultralytics.nn.modules.Conv	[128, 256, 3, 2]
8	-1	1	460288	ultralytics.nn.modules.C2f	[256, 256, 1, True]
9	-1	1	164608	ultralytics.nn.modules.SPPF	[256, 256, 5]

```

10         -1 1 0 torch.nn.modules.upsampling.Upsample [None, 2, 'nearest']
11         [-1, 6] 1 0 ultralytics.nn.modules.Concat [1]
12         -1 1 148224 ultralytics.nn.modules.C2f [384, 128, 1]
13         -1 1 0 torch.nn.modules.upsampling.Upsample [None, 2, 'nearest']
14         [-1, 4] 1 0 ultralytics.nn.modules.Concat [1]
15         -1 1 37248 ultralytics.nn.modules.C2f [192, 64, 1]
16         -1 1 36992 ultralytics.nn.modules.Conv [64, 64, 3, 2]
17         [-1, 12] 1 0 ultralytics.nn.modules.Concat [1]
18         -1 1 123648 ultralytics.nn.modules.C2f [192, 128, 1]
19         -1 1 147712 ultralytics.nn.modules.Conv [128, 128, 3, 2]
20         [-1, 9] 1 0 ultralytics.nn.modules.Concat [1]
21         -1 1 493056 ultralytics.nn.modules.C2f [384, 256, 1]
22         [15, 18, 21] 1 751507 ultralytics.nn.modules.Detect [1, [64, 128, 256]]

```

Model summary: 225 layers, 3011043 parameters, 3011027 gradients, 8.2 GFLOPs

Transferred 319/355 items from pretrained weights

optimizer: SGD(lr=0.01) with parameter groups 57 weight(decay=0.0), 64 weight(decay=0.0005), 63 bias

train: Scanning /content/Licence-Plate-Detection-using-YOLO-V8/License-Plate-Detector-2/train/labels... 277 images, 0 backgrounds, 0 classes
Signal received. 15 <frame at 0x7e6011a14040, file '/usr/lib/python3.10/multiprocessing/util.py', line 435, code _flush_std_streams>

train: New cache created: /content/Licence-Plate-Detection-using-YOLO-V8/License-Plate-Detector-2/train/labels.cache

augmentations: Blur(p=0.01, blur_limit=(3, 7)), MedianBlur(p=0.01, blur_limit=(3, 7)), ToGray(p=0.01), CLAHE(p=0.01, clip_limit=(1, 4))
val: Scanning /content/Licence-Plate-Detection-using-YOLO-V8/License-Plate-Detector-2/valid/labels... 81 images, 0 backgrounds, 0 classes
Signal received. 15 <frame at 0x7e6012a73920, file '/usr/lib/python3.10/multiprocessing/synchronize.py', line 98, code __exit__>

val: New cache created: /content/Licence-Plate-Detection-using-YOLO-V8/License-Plate-Detector-2/valid/labels.cache

Image sizes 640 train, 640 val

Using 2 dataloader workers

Logging results to runs/detect/train

Starting training for 50 epochs...

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
1/50	2.44G	1.226	3.688	1.334	5	640: 100% 18/18 [00:14<00:00, 1.25it/s]
	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% 3/3 [00:02<00:00, 1.12it/s]
	all	81	81	0.00329	0.988	0.432 0.315

!python /content/Licence-Plate-Detection-using-YOLO-V8/ultralytics/yolo/v8/detect/predict.py model='/content/Licence-Plate-Detection-using-Y

2024-03-04 15:20:39.219129: E external/local_xla/xla/stream_executor/cuda/cuda_dnn.cc:9261] Unable to register cuDNN factory: Attempti

2024-03-04 15:20:39.219274: E external/local_xla/xla/stream_executor/cuda/cuda_fft.cc:607] Unable to register cuFFT factory: Attempti

2024-03-04 15:20:39.221252: E external/local_xla/xla/stream_executor/cuda/cuda_blas.cc:1515] Unable to register cuBLAS factory: Attempt

2024-03-04 15:20:40.534159: W tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not find TensorRT

Ultralytics YOLOv8.0.3 Python-3.10.12 torch-2.1.0+cu121 CUDA:0 (Tesla T4, 15102MiB)

Fusing layers...

Model summary: 168 layers, 3005843 parameters, 0 gradients, 8.1 GFLOPs

video 1/1 (1/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 2 LicensePlates, 71.4ms

video 1/1 (2/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 8.0ms

video 1/1 (3/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 6.6ms

video 1/1 (4/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 6.2ms

video 1/1 (5/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 8.1ms

video 1/1 (6/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 2 LicensePlates, 7.1ms

video 1/1 (7/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 8.2ms

video 1/1 (8/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 2 LicensePlates, 6.8ms

video 1/1 (9/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 6.6ms

video 1/1 (10/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 3 LicensePlates, 7.2ms

video 1/1 (11/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 3 LicensePlates, 6.8ms

video 1/1 (12/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 8.2ms

video 1/1 (13/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 2 LicensePlates, 7.1ms

video 1/1 (14/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 13.4ms

video 1/1 (15/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 3 LicensePlates, 7.7ms

video 1/1 (16/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 6.6ms

video 1/1 (17/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 6.7ms

video 1/1 (18/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 6.8ms

video 1/1 (19/1800) /content/Licence-Plate-Detection-using-YOLO-V8/demo3.mp4: 384x640 1 LicensePlate, 6.8ms