```python
from google.colab import drive

drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

```python
!pip install ultralytics==8.0.20

from IPython import display
display.clear_output()

import ultralytics
ultralytics.checks()
```

```
Ultralytics YOLOv8.0.20 🚀 Python-3.10.12 torch-2.1.0+cu121 CPU
Setup complete ✅ (2 CPUs, 12.7 GB RAM, 26.3/107.7 GB disk)
```

```python
from ultralytics import YOLO

model = YOLO("yolov8s.pt")

model.train(data='/content/drive/MyDrive/Tree_Dataset/data.yaml',epochs=10)
from IPython.display import display, Image
```

```
       Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances       Size
        3/10         0G       2.324       1.755       1.805        113        640: 100%|██████████| 9/9 [06:33<00:00, 43.69s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95):   0%|          | 0/1 [00:00<?, ?it/s]WA
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 1/1 [00:26<00:00, 26.6
                 all         19       1157      0.472      0.343      0.318      0.193

       Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances       Size
        4/10         0G       2.261       1.546        1.68        148        640: 100%|██████████| 9/9 [06:20<00:00, 42.28s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95):   0%|          | 0/1 [00:00<?, ?it/s]WA
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 1/1 [00:26<00:00, 26.4
                 all         19       1157      0.649      0.424      0.474      0.281

       Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances       Size
        5/10         0G        2.21       1.455       1.691         97        640: 100%|██████████| 9/9 [06:23<00:00, 42.62s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95):   0%|          | 0/1 [00:00<?, ?it/s]WA
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 1/1 [00:26<00:00, 26.4
                 all         19       1157       0.41      0.605      0.564      0.321

       Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances       Size
        6/10         0G       2.121       1.391        1.63        115        640: 100%|██████████| 9/9 [06:21<00:00, 42.34s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 1/1 [00:25<00:00, 25.7
                 all         19       1157      0.404      0.669      0.374      0.181

       Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances       Size
        7/10         0G       2.126       1.293       1.639        101        640: 100%|██████████| 9/9 [06:08<00:00, 41.00s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 1/1 [00:25<00:00, 25.5
                 all         19       1157       0.49      0.598      0.436      0.218

       Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances       Size
        8/10         0G       2.063       1.303       1.529         67        640: 100%|██████████| 9/9 [06:12<00:00, 41.37s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 1/1 [00:25<00:00, 25.2
                 all         19       1157      0.433      0.666       0.38      0.179

       Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances       Size
        9/10         0G       2.138       1.286       1.547         89        640: 100%|██████████| 9/9 [06:15<00:00, 41.71s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 1/1 [00:25<00:00, 25.2
                 all         19       1157      0.484      0.648       0.41      0.197

       Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances       Size
       10/10         0G       2.066       1.148       1.511         84        640: 100%|██████████| 9/9 [06:20<00:00, 42.28s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 1/1 [00:24<00:00, 24.7
                 all         19       1157      0.502      0.655      0.439      0.216

10 epochs completed in 1.154 hours.
Optimizer stripped from runs/detect/train/weights/last.pt, 22.5MB
Optimizer stripped from runs/detect/train/weights/best.pt, 22.5MB

Validating runs/detect/train/weights/best.pt...
Ultralytics YOLOv8.0.20 🚀 Python-3.10.12 torch-2.1.0+cu121 CPU
Model summary (fused): 168 layers, 11126358 parameters, 0 gradients, 28.4 GFLOPs
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95):   0%|          | 0/1 [00:00<?, ?it/s]WA
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 1/1 [00:19<00:00, 19.2
                 all         19       1157      0.411      0.605      0.565      0.321
           Palm Tree         19        247      0.254      0.874      0.786       0.52
          Bruce Tree         19        910      0.568      0.336      0.343      0.121
Speed: 3.4ms pre-process, 746.8ms inference, 0.0ms loss, 79.5ms post-process per image
Results saved to runs/detect/train
```

```
%cd /content/drive/MyDrive/Tree_Dataset
```

```
!yolo task=detect mode=train model=yolov8s.pt data= data.yaml epochs=10 imgsz=640 plots=True
```

```
           Palm Tree         19        247      0.323       0.81      0.603      0.381
          Bruce Tree         19        910      0.607    0.00513     0.0627     0.0226

     Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
      3/10        0G      2.324      1.755      1.805        113        640: 100% 9/9 [06:18<00:00, 42.01s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95):   0% 0/1 [00:00<?, ?it/s]WARNING ⚠️ NMS
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100% 1/1 [00:25<00:00, 25.36s/it]
                 all         19       1157      0.472      0.343      0.318      0.193
           Palm Tree         19        247      0.501      0.668      0.575      0.363
          Bruce Tree         19        910      0.443     0.0184     0.0619     0.0233

     Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
      4/10        0G      2.261      1.546       1.68        148        640: 100% 9/9 [06:06<00:00, 40.71s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95):   0% 0/1 [00:00<?, ?it/s]WARNING ⚠️ NMS
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100% 1/1 [00:24<00:00, 24.92s/it]
                 all         19       1157      0.649      0.424      0.474      0.281
           Palm Tree         19        247      0.494      0.785      0.741      0.481
          Bruce Tree         19        910      0.803     0.0628      0.207     0.0797

     Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
      5/10        0G       2.21      1.455      1.691         97        640: 100% 9/9 [06:05<00:00, 40.64s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95):   0% 0/1 [00:00<?, ?it/s]WARNING ⚠️ NMS
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100% 1/1 [00:26<00:00, 26.23s/it]
                 all         19       1157       0.41      0.605      0.564      0.321
           Palm Tree         19        247      0.254      0.874      0.786       0.52
          Bruce Tree         19        910      0.567      0.336      0.343      0.121

     Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
      6/10        0G      2.121      1.391       1.63        115        640: 100% 9/9 [06:12<00:00, 41.42s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100% 1/1 [00:24<00:00, 24.35s/it]
                 all         19       1157      0.404      0.669      0.374      0.181
           Palm Tree         19        247      0.258      0.883      0.344      0.216
          Bruce Tree         19        910       0.55      0.456      0.404      0.145

     Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
      7/10        0G      2.126      1.293      1.639        101        640: 100% 9/9 [06:07<00:00, 40.86s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100% 1/1 [00:25<00:00, 25.67s/it]
                 all         19       1157       0.49      0.598      0.436      0.218
           Palm Tree         19        247      0.449      0.696      0.441      0.285
          Bruce Tree         19        910      0.532      0.499       0.43      0.151

     Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
      8/10        0G      2.063      1.303      1.529         67        640: 100% 9/9 [06:12<00:00, 41.44s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100% 1/1 [00:24<00:00, 24.06s/it]
                 all         19       1157      0.433      0.666       0.38      0.179
           Palm Tree         19        247      0.312      0.858      0.368      0.224
          Bruce Tree         19        910      0.554      0.474      0.393      0.135

     Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
      9/10        0G      2.138      1.286      1.547         89        640: 100% 9/9 [06:10<00:00, 41.18s/it]
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100% 1/1 [00:23<00:00, 23.26s/it]
                 all         19       1157      0.484      0.648       0.41      0.197
           Palm Tree         19        247      0.336       0.85      0.392      0.248
          Bruce Tree         19        910      0.632      0.446      0.429      0.146

     Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
     10/10        0G      2.066      1.148      1.511         84        640: 100% 9/9 [06:09<00:00, 41.11s/it]
```

```
!ls runs/detect/train3
```

```
args.yaml                                        PR_curve.png        train_batch1.jpg
confusion_matrix.png                             R_curve.png         train_batch2.jpg
events.out.tfevents.1707753310.2887195aee2b.20576.0  results.csv     val_batch0_labels.jpg
F1_curve.png                                     results.png         val_batch0_pred.jpg
P_curve.png                                      train_batch0.jpg    weights
```

```
!yolo task=detect mode=val model=/content/drive/MyDrive/Tree_Dataset/runs/detect/train3/weights/best.pt data=data.yaml
```

```
2024-02-12 17:32:18.590340: E external/local_xla/xla/stream_executor/cuda/cuda_dnn.cc:9261] Unable to register cuDNN factory: Attemp
2024-02-12 17:32:18.590490: E external/local_xla/xla/stream_executor/cuda/cuda_fft.cc:607] Unable to register cuFFT factory: Attempt
2024-02-12 17:32:18.595621: E external/local_xla/xla/stream_executor/cuda/cuda_blas.cc:1515] Unable to register cuBLAS factory: Atte
2024-02-12 17:32:21.522311: W tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not find TensorRT
Ultralytics YOLOv8.0.20 🚀 Python-3.10.12 torch-2.1.0+cu121 CPU
Model summary (fused): 168 layers, 11126358 parameters, 0 gradients, 28.4 GFLOPs
val: Scanning /content/drive/MyDrive/Tree_Dataset/valid/labels.cache... 19 images, 0 backgrounds, 0 corrupt: 100% 19/19 [00:00<?, ?i
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95):   0% 0/2 [00:00<?, ?it/s]WARNING ⚠️ NMS t
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95):  50% 1/2 [00:30<00:30, 30.56s/it]WARNING
               Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100% 2/2 [00:36<00:00, 18.29s/it]
                 all         19       1157      0.376      0.627      0.561      0.317
           Palm Tree         19        247      0.254      0.874      0.786       0.52
          Bruce Tree         19        910      0.498      0.379      0.336      0.114
Speed: 12.3ms pre-process, 1571.6ms inference, 0.0ms loss, 117.2ms post-process per image
```

```
!yolo task=detect mode=predict model=runs/detect/train3/weights/best.pt conf=.25 source=/content/drive/MyDrive/test_dataset/test/images
```

```
2024-02-12 18:09:53.970934: E external/local_xla/xla/stream_executor/cuda/cuda_dnn.cc:9261] Unable to register cuDNN factory: Attemp
2024-02-12 18:09:53.971007: E external/local_xla/xla/stream_executor/cuda/cuda_fft.cc:607] Unable to register cuFFT factory: Attempt
2024-02-12 18:09:53.973098: E external/local_xla/xla/stream_executor/cuda/cuda_blas.cc:1515] Unable to register cuBLAS factory: Atte
2024-02-12 18:09:55.462710: W tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not find TensorRT
Ultralytics YOLOv8.0.20 🚀 Python-3.10.12 torch-2.1.0+cu121 CPU
Model summary (fused): 168 layers, 11126358 parameters, 0 gradients, 28.4 GFLOPs
image 1/15 /content/drive/MyDrive/test_dataset/test/images/Image 1.jpeg: 640x640 2 Palm Trees, 54 Bruce Trees, 717.4ms
image 2/15 /content/drive/MyDrive/test_dataset/test/images/Image 10.jpg: 480x640 91 Palm Trees, 2 Bruce Trees, 459.2ms
image 3/15 /content/drive/MyDrive/test_dataset/test/images/Image 11.jpeg: 640x640 148 Bruce Trees, 967.9ms
image 4/15 /content/drive/MyDrive/test_dataset/test/images/Image 12.jpeg: 640x640 94 Bruce Trees, 999.4ms
image 5/15 /content/drive/MyDrive/test_dataset/test/images/Image 13.jpeg: 640x640 2 Palm Trees, 151 Bruce Trees, 632.3ms
image 6/15 /content/drive/MyDrive/test_dataset/test/images/Image 14.jpeg: 640x640 254 Bruce Trees, 638.3ms
image 7/15 /content/drive/MyDrive/test_dataset/test/images/Image 15.jpeg: 640x640 4 Palm Trees, 162 Bruce Trees, 615.4ms
image 8/15 /content/drive/MyDrive/test_dataset/test/images/Image 2.jpeg: 640x640 1 Palm Tree, 80 Bruce Trees, 625.2ms
image 9/15 /content/drive/MyDrive/test_dataset/test/images/Image 3.jpeg: 640x640 197 Bruce Trees, 650.3ms
image 10/15 /content/drive/MyDrive/test_dataset/test/images/Image 4.jpg: 480x640 126 Palm Trees, 452.7ms
image 11/15 /content/drive/MyDrive/test_dataset/test/images/Image 5.jpg: 480x640 124 Palm Trees, 466.2ms
image 12/15 /content/drive/MyDrive/test_dataset/test/images/Image 6.jpg: 480x640 106 Palm Trees, 717.1ms
image 13/15 /content/drive/MyDrive/test_dataset/test/images/Image 7.jpg: 480x640 148 Palm Trees, 1 Bruce Tree, 547.3ms
image 14/15 /content/drive/MyDrive/test_dataset/test/images/Image 8.jpg: 480x640 105 Palm Trees, 1 Bruce Tree, 476.2ms
image 15/15 /content/drive/MyDrive/test_dataset/test/images/Image 9.jpg: 480x640 94 Palm Trees, 474.6ms
Speed: 1.5ms pre-process, 629.3ms inference, 2.0ms postprocess per image at shape (1, 3, 640, 640)
Results saved to runs/detect/predict2
```

```
!ls runs/detect/predict2
```

```
'Image 10.jpg'    'Image 13.jpeg'   'Image 1.jpeg'   'Image 4.jpg'   'Image 7.jpg'
'Image 11.jpeg'   'Image 14.jpeg'   'Image 2.jpeg'   'Image 5.jpg'   'Image 8.jpg'
'Image 12.jpeg'   'Image 15.jpeg'   'Image 3.jpeg'   'Image 6.jpg'   'Image 9.jpg'
```