In [ ]: !pip install ultralytics

```
Collecting ultralytics
 Downloading ultralytics-8.3.170-py3-none-any.whl.metadata (37 kB)
Requirement already satisfied: numpy>=1.23.0 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (2.0.2)
Requirement already satisfied: matplotlib>=3.3.0 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (3.10.0)
Requirement already satisfied: opency-python>=4.6.0 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (4.12.0.88)
Requirement already satisfied: pillow>=7.1.2 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (11.3.0)
Requirement already satisfied: pyyaml>=5.3.1 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (6.0.2)
Requirement already satisfied: requests>=2.23.0 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (2.32.3)
Requirement already satisfied: scipy>=1.4.1 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (1.16.0)
Requirement already satisfied: torch>=1.8.0 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (2.6.0+cu124)
Requirement already satisfied: torchvision>=0.9.0 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (0.21.0+cu124)
Requirement already satisfied: tqdm>=4.64.0 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (4.67.1)
Requirement already satisfied: psutil in /usr/local/lib/python3.11/dist-packages (from ultralytics) (5.9.5)
Requirement already satisfied: py-cpuinfo in /usr/local/lib/python3.11/dist-packages (from ultralytics) (9.0.0)
Requirement already satisfied: pandas>=1.1.4 in /usr/local/lib/python3.11/dist-packages (from ultralytics) (2.2.2)
Collecting ultralytics-thop>=2.0.0 (from ultralytics)
 Downloading ultralytics thop-2.0.14-py3-none-any.whl.metadata (9.4 kB)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.3.0->ultralytic
s) (1.3.2)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.3.0->ultralytics)
(0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.3.0->ultralytic
s) (4.59.0)
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.3.0->ultralytic
s) (1.4.8)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.3.0->ultralytics)
(25.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.3.0->ultralytic
s) (3.2.3)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.3.0->ultraly
tics) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-packages (from pandas>=1.1.4->ultralytics) (2025.
2)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.11/dist-packages (from pandas>=1.1.4->ultralytics) (202
5.2)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests>=2.23.0->ultr
alvtics) (3.4.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests>=2.23.0->ultralytics) (3.
10)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests>=2.23.0->ultralytic
s) (2.5.0)
```

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Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests>=2.23.0->ultralytic
s) (2025.7.14)
Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ultralytics) (3.18.0)
Requirement already satisfied: typing-extensions>=4.10.0 in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ultraly
tics) (4.14.1)
Requirement already satisfied: networkx in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ultralytics) (3.5)
Requirement already satisfied: jinja2 in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ultralytics) (3.1.6)
Requirement already satisfied: fsspec in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ultralytics) (2025.3.0)
Collecting nvidia-cuda-nvrtc-cu12==12.4.127 (from torch>=1.8.0->ultralvtics)
 Downloading nvidia cuda nvrtc cu12-12.4.127-pv3-none-manylinux2014 x86 64.whl.metadata (1.5 kB)
Collecting nvidia-cuda-runtime-cu12==12.4.127 (from torch>=1.8.0->ultralytics)
 Downloading nvidia cuda runtime cu12-12.4.127-py3-none-manylinux2014 x86 64.whl.metadata (1.5 kB)
Collecting nvidia-cuda-cupti-cu12==12.4.127 (from torch>=1.8.0->ultralytics)
 Downloading nvidia cuda cupti cu12-12.4.127-py3-none-manylinux2014 x86 64.whl.metadata (1.6 kB)
Collecting nvidia-cudnn-cu12==9.1.0.70 (from torch>=1.8.0->ultralytics)
  Downloading nvidia cudnn cu12-9.1.0.70-py3-none-manylinux2014 x86 64.whl.metadata (1.6 kB)
Collecting nvidia-cublas-cu12==12.4.5.8 (from torch>=1.8.0->ultralytics)
 Downloading nvidia cublas cu12-12.4.5.8-py3-none-manylinux2014 x86 64.whl.metadata (1.5 kB)
Collecting nvidia-cufft-cu12==11.2.1.3 (from torch>=1.8.0->ultralytics)
 Downloading nvidia cufft cu12-11.2.1.3-py3-none-manylinux2014 x86 64.whl.metadata (1.5 kB)
Collecting nvidia-curand-cu12==10.3.5.147 (from torch>=1.8.0->ultralvtics)
 Downloading nvidia curand cu12-10.3.5.147-py3-none-manylinux2014 x86 64.whl.metadata (1.5 kB)
Collecting nvidia-cusolver-cu12==11.6.1.9 (from torch>=1.8.0->ultralytics)
 Downloading nvidia cusolver cu12-11.6.1.9-pv3-none-manylinux2014 x86 64.whl.metadata (1.6 kB)
Collecting nvidia-cusparse-cu12==12.3.1.170 (from torch>=1.8.0->ultralytics)
 Downloading nvidia cusparse cu12-12.3.1.170-py3-none-manylinux2014 x86 64.whl.metadata (1.6 kB)
Requirement already satisfied: nvidia-cusparselt-cu12==0.6.2 in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ult
ralytics) (0.6.2)
Requirement already satisfied: nvidia-nccl-cu12==2.21.5 in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ultralyt
ics) (2.21.5)
Requirement already satisfied: nvidia-nvtx-cu12==12.4.127 in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ultral
ytics) (12.4.127)
Collecting nvidia-nvjitlink-cu12==12.4.127 (from torch>=1.8.0->ultralytics)
 Downloading nvidia nvjitlink cu12-12.4.127-py3-none-manylinux2014 x86 64.whl.metadata (1.5 kB)
Requirement already satisfied: triton==3.2.0 in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ultralytics) (3.2.
Requirement already satisfied: sympy==1.13.1 in /usr/local/lib/python3.11/dist-packages (from torch>=1.8.0->ultralytics) (1.13.
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.11/dist-packages (from sympy==1.13.1->torch>=1.8.0-
>ultralytics) (1.3.0)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil>=2.7->matplotlib>=3.3.
```

```
0->ultralytics) (1.17.0)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.11/dist-packages (from jinja2->torch>=1.8.0->ultralyti
(3.0.2)
Downloading ultralytics-8.3.170-py3-none-any.whl (1.0 MB)
                                      --- 1.0/1.0 MB 20.0 MB/s eta 0:00:00
Downloading nvidia cublas cu12-12.4.5.8-py3-none-manylinux2014 x86 64.whl (363.4 MB)
                            ----- 363.4/363.4 MB 3.0 MB/s eta 0:00:00
Downloading nvidia cuda cupti cu12-12.4.127-py3-none-manylinux2014 x86 64.whl (13.8 MB)
                                   ----- 13.8/13.8 MB 104.9 MB/s eta 0:00:00
Downloading nvidia cuda nvrtc cu12-12.4.127-py3-none-manylinux2014 x86 64.whl (24.6 MB)
                                 ----- 24.6/24.6 MB 86.9 MB/s eta 0:00:00
Downloading nvidia cuda runtime cu12-12.4.127-py3-none-manylinux2014 x86 64.whl (883 kB)
                           Downloading nvidia cudnn cu12-9.1.0.70-py3-none-manylinux2014_x86_64.whl (664.8 MB)
                                  ----- 664.8/664.8 MB 1.7 MB/s eta 0:00:00
Downloading nvidia cufft cu12-11.2.1.3-py3-none-manylinux2014 x86 64.whl (211.5 MB)
                                     ---- 211.5/211.5 MB 11.6 MB/s eta 0:00:00
Downloading nvidia curand cu12-10.3.5.147-py3-none-manylinux2014 x86 64.whl (56.3 MB)
                                     ---- 56.3/56.3 MB 41.1 MB/s eta 0:00:00
Downloading nvidia cusolver cu12-11.6.1.9-py3-none-manylinux2014 x86 64.whl (127.9 MB)
                               ------ 127.9/127.9 MB 18.6 MB/s eta 0:00:00
Downloading nvidia cusparse cu12-12.3.1.170-py3-none-manylinux2014 x86 64.whl (207.5 MB)
                                    ----- 207.5/207.5 MB 4.7 MB/s eta 0:00:00
Downloading nvidia nvjitlink cu12-12.4.127-py3-none-manylinux2014_x86_64.whl (21.1 MB)
                                     ---- 21.1/21.1 MB 112.7 MB/s eta 0:00:00
Downloading ultralytics thop-2.0.14-py3-none-any.whl (26 kB)
Installing collected packages: nvidia-nvjitlink-cu12, nvidia-curand-cu12, nvidia-cufft-cu12, nvidia-cuda-runtime-cu12, nvidia-c
uda-nvrtc-cu12, nvidia-cuda-cupti-cu12, nvidia-cublas-cu12, nvidia-cusparse-cu12, nvidia-cudnn-cu12, nvidia-cusolver-cu12, ultr
alytics-thop, ultralytics
 Attempting uninstall: nvidia-nvjitlink-cu12
   Found existing installation: nvidia-nvjitlink-cu12 12.5.82
   Uninstalling nvidia-nvjitlink-cu12-12.5.82:
     Successfully uninstalled nvidia-nvjitlink-cu12-12.5.82
 Attempting uninstall: nvidia-curand-cu12
   Found existing installation: nvidia-curand-cu12 10.3.6.82
   Uninstalling nvidia-curand-cu12-10.3.6.82:
     Successfully uninstalled nvidia-curand-cu12-10.3.6.82
  Attempting uninstall: nvidia-cufft-cu12
   Found existing installation: nvidia-cufft-cu12 11.2.3.61
   Uninstalling nvidia-cufft-cu12-11.2.3.61:
     Successfully uninstalled nvidia-cufft-cu12-11.2.3.61
```

```
Attempting uninstall: nvidia-cuda-runtime-cu12
           Found existing installation: nvidia-cuda-runtime-cu12 12.5.82
           Uninstalling nvidia-cuda-runtime-cu12-12.5.82:
             Successfully uninstalled nvidia-cuda-runtime-cu12-12.5.82
         Attempting uninstall: nvidia-cuda-nvrtc-cu12
           Found existing installation: nvidia-cuda-nvrtc-cu12 12.5.82
           Uninstalling nvidia-cuda-nvrtc-cu12-12.5.82:
             Successfully uninstalled nvidia-cuda-nvrtc-cu12-12.5.82
         Attempting uninstall: nvidia-cuda-cupti-cu12
           Found existing installation: nvidia-cuda-cupti-cu12 12.5.82
           Uninstalling nvidia-cuda-cupti-cu12-12.5.82:
             Successfully uninstalled nvidia-cuda-cupti-cu12-12.5.82
         Attempting uninstall: nvidia-cublas-cu12
           Found existing installation: nvidia-cublas-cu12 12.5.3.2
           Uninstalling nvidia-cublas-cu12-12.5.3.2:
             Successfully uninstalled nvidia-cublas-cu12-12.5.3.2
         Attempting uninstall: nvidia-cusparse-cu12
           Found existing installation: nvidia-cusparse-cu12 12.5.1.3
           Uninstalling nvidia-cusparse-cu12-12.5.1.3:
             Successfully uninstalled nvidia-cusparse-cu12-12.5.1.3
         Attempting uninstall: nvidia-cudnn-cu12
           Found existing installation: nvidia-cudnn-cu12 9.3.0.75
           Uninstalling nvidia-cudnn-cu12-9.3.0.75:
             Successfully uninstalled nvidia-cudnn-cu12-9.3.0.75
         Attempting uninstall: nvidia-cusolver-cu12
           Found existing installation: nvidia-cusolver-cu12 11.6.3.83
           Uninstalling nvidia-cusolver-cu12-11.6.3.83:
             Successfully uninstalled nvidia-cusolver-cu12-11.6.3.83
       Successfully installed nvidia-cublas-cu12-12.4.5.8 nvidia-cuda-cupti-cu12-12.4.127 nvidia-cuda-nvrtc-cu12-12.4.127 nvidia-cuda-
       runtime-cu12-12.4.127 nvidia-cudnn-cu12-9.1.0.70 nvidia-cufft-cu12-11.2.1.3 nvidia-curand-cu12-10.3.5.147 nvidia-cusolver-cu12-
       11.6.1.9 nvidia-cusparse-cu12-12.3.1.170 nvidia-nvjitlink-cu12-12.4.127 ultralytics-8.3.170 ultralytics-thop-2.0.14
In [ ]: from ultralytics import YOLO
        import torch
        import os
```

Creating new Ultralytics Settings v0.0.6 file <a href="View Ultralytics Settings">View Ultralytics Settings with 'yolo settings' or at '/root/.config/Ultralytics/settings.json'</a>
Update Settings with 'yolo settings key=value', i.e. 'yolo settings runs\_dir=path/to/dir'. For help see https://docs.ultralytics.com/quickstart/#ultralytics-settings.

```
In [ ]: print("Train images:", len(os.listdir('/content/datasets/brain-tumor/train')))
        print("Valid images:", len(os.listdir('/content/datasets/brain-tumor/valid')))
        with open('datasets/brain-tumor.yaml', 'r', encoding='utf-8') as f:
            print(f.read())
       Train images: 4
       Valid images: 3
       # Ultralytics YOLO \( \infty \), AGPL-3.0 license
       # Brain-tumor dataset by Ultralytics
       # Documentation: https://docs.ultralytics.com/datasets/detect/brain-tumor/
       # Example usage: yolo train data=brain-tumor.yaml
       # parent
       # — ultralytics
       # — datasets
             ☐ brain-tumor ← downloads here (4.05 MB)
       # Train/val/test sets as 1) dir: path/to/imgs, 2) file: path/to/imgs.txt, or 3) list: [path/to/imgs1, path/to/imgs2, ..]
       path: ../datasets/brain-tumor # dataset root dir
       train: train/images # train images (relative to 'path') 893 images
       val: valid/images # val images (relative to 'path') 223 images
       test: # test images (relative to 'path')
       # Classes
       names:
         0: negative
         1: positive
       # Download script/URL (optional)
       download: https://github.com/ultralytics/assets/releases/download/v0.0.0/brain-tumor.zip
In [ ]: # Cargar un modelo YOLOv8 pequeño (rápido para dataset pequeño)
        model = YOLO('yolov8n.pt') # también puedes usar yolov8s.pt si tienes buena GPU
In [ ]: model.train(
            data='datasets/brain-tumor.yaml', # Ruta a tu YAML
                             # número de épocas
            epochs=50,
                                        # tamaño de imagen
            imgsz=640,
                                      # reduce si tu GPU tiene poca memoria
            batch=8,
                                           # 0 = usa la primera GPU disponible, 'cpu' si no tienes GPU
            device=0
```

Ultralytics 8.3.170 Python-3.11.13 torch-2.6.0+cu124 CUDA:0 (NVIDIA A100-SXM4-40GB, 40507MiB)

engine/trainer: agnostic\_nms=False, amp=True, augment=False, auto\_augment=randaugment, batch=8, bgr=0.0, box=7.5, cache=False, cfg=None, classes=None, close\_mosaic=10, cls=0.5, conf=None, copy\_paste=0.0, copy\_paste\_mode=flip, cos\_lr=False, cutmix=0.0, da ta=datasets/brain-tumor.yaml, degrees=0.0, deterministic=True, device=0, dfl=1.5, dnn=False, dropout=0.0, dynamic=False, embed=None, epochs=50, erasing=0.4, exist\_ok=False, fliplr=0.5, flipud=0.0, format=torchscript, fraction=1.0, freeze=None, half=False, hsv\_h=0.015, hsv\_s=0.7, hsv\_v=0.4, imgsz=640, int8=False, iou=0.7, keras=False, kobj=1.0, line\_width=None, lr0=0.01, lrf=0.0

1, mask\_ratio=4, max\_det=300, mixup=0.0, mode=train, model=yolov8n.pt, momentum=0.937, mosaic=1.0, multi\_scale=False, name=train3, nbs=64, nms=False, opset=None, optimize=False, optimizer=auto, overlap\_mask=True, patience=100, perspective=0.0, plots=True, pose=12.0, pretrained=True, profile=False, project=None, rect=False, resume=False, retina\_masks=False, save\_true, save\_conf=False, save\_crop=False, save\_dir=runs/detect/train3, save\_frames=False, save\_json=False, save\_period=-1, save\_txt=False, scale=0.5, seed=0, shear=0.0, show=False, show\_boxes=True, show\_conf=True, show\_labels=True, simplify=True, single\_cls=False, source=None, split=val, stream\_buffer=False, task=detect, time=None, tracker=botsort.yaml, translate=0.1, val=True, verbose=True, vid\_stride=1, visualize=False, warmup\_bias\_lr=0.1, warmup\_epochs=3.0, warmup\_momentum=0.8, weight\_decay=0.0005, workers=8, workspace=None

Overriding model.yaml nc=80 with nc=2

	from	n	params	module	arguments
0	-1	1	464	ultralytics.nn.modules.conv.Conv	[3, 16, 3, 2]
1	-1	1	4672	ultralytics.nn.modules.conv.Conv	[16, 32, 3, 2]
2	-1	1	7360	ultralytics.nn.modules.block.C2f	[32, 32, 1, True]
3	-1	1	18560	ultralytics.nn.modules.conv.Conv	[32, 64, 3, 2]
4	-1	2	49664	ultralytics.nn.modules.block.C2f	[64, 64, 2, True]
5	-1	1	73984	ultralytics.nn.modules.conv.Conv	[64, 128, 3, 2]
6	-1	2	197632	ultralytics.nn.modules.block.C2f	[128, 128, 2, True]
7	-1	1	295424	ultralytics.nn.modules.conv.Conv	[128, 256, 3, 2]
8	-1	1	460288	ultralytics.nn.modules.block.C2f	[256, 256, 1, True]
9	-1	1	164608	ultralytics.nn.modules.block.SPPF	[256, 256, 5]
10	-1	1	0	torch.nn.modules.upsampling.Upsample	[None, 2, 'nearest']
11	[-1, 6]	1	0	ultralytics.nn.modules.conv.Concat	[1]
12	-1	1	148224	ultralytics.nn.modules.block.C2f	[384, 128, 1]
13	-1	1	0	torch.nn.modules.upsampling.Upsample	[None, 2, 'nearest']
14	[-1, 4]	1	0	ultralytics.nn.modules.conv.Concat	[1]
15	-1	1	37248	ultralytics.nn.modules.block.C2f	[192, 64, 1]
16	-1	1	36992	ultralytics.nn.modules.conv.Conv	[64, 64, 3, 2]
17	[-1, 12]	1	0	ultralytics.nn.modules.conv.Concat	[1]
18	-1	1	123648	ultralytics.nn.modules.block.C2f	[192, 128, 1]
19	-1	1	147712	ultralytics.nn.modules.conv.Conv	[128, 128, 3, 2]
20	[-1, 9]	1	0	ultralytics.nn.modules.conv.Concat	[1]
21	-1	1	493056	ultralytics.nn.modules.block.C2f	[384, 256, 1]
22	[15, 18, 21]	1	751702	ultralytics.nn.modules.head.Detect	[2, [64, 128, 256]]
Model	summary: 129 layer	٠s,	3,011,238	parameters, 3,011,222 gradients, 8.2 GFLOPs	

Transferred 319/355 items from pretrained weights

Freezing layer 'model.22.dfl.conv.weight'

AMP: running Automatic Mixed Precision (AMP) checks...

AMP: checks passed <

train: Fast image access ✓ (ping: 0.0±0.0 ms, read: 160.0±80.8 MB/s, size: 3.7 KB)

train: Scanning /content/datasets/brain-tumor/train/labels.cache... 878 images, 15 backgrounds, 0 corrupt: 100%| 89 3/893 [00:00<?, ?it/s]

albumentations: Blur(p=0.01, blur\_limit=(3, 7)), MedianBlur(p=0.01, blur\_limit=(3, 7)), ToGray(p=0.01, method='weighted\_averag e', num\_output\_channels=3), CLAHE(p=0.01, clip\_limit=(1.0, 4.0), tile\_grid\_size=(8, 8))

val: Fast image access ✓ (ping: 0.0±0.0 ms, read: 116.9±76.9 MB/s, size: 3.4 KB)

val: Scanning /content/datasets/brain-tumor/valid/labels... 223 images, 0 backgrounds, 0 corrupt: 100%| 223/223 [00: 00<00:00, 1336.40it/s]</pre>

val: New cache created: /content/datasets/brain-tumor/valid/labels.cache

Plotting labels to runs/detect/train3/labels.jpg...

optimizer: 'optimizer=auto' found, ignoring 'lr0=0.01' and 'momentum=0.937' and determining best 'optimizer', 'lr0' and 'moment um' automatically...

optimizer: AdamW(lr=0.001667, momentum=0.9) with parameter groups 57 weight(decay=0.0), 64 weight(decay=0.0005), 63 bias(decay=
0.0)

Image sizes 640 train, 640 val

Using 8 dataloader workers

Logging results to runs/detect/train3

Starting training for 50 epochs...

	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size		
	1/50	1.14G	1.358	3.27	1.212	13	640:	100%	112/112 [00:10<00:00, 11.15it/
s]									
		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%	14/14 [00:02<00:00,
6.74	it/s]								
		all	223	241	0.478	0.495	0.416	0.26	
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size		
	2/50	1.43G	1.246	2.353	1.16	6	640:	100%	112/112 [00:08<00:00, 13.93it/
s]									
		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%	14/14 [00:01<00:00,
12.5	9it/s]								
		all	223	241	0.406	0.725	0.44	0.291	
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size		

7	3/50	1.45G	1.242	2.004	1.162	6	640:	100%  112/112 [00:08<00:00, 13.78it/
s]	-1. ( 7	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:01<00:00,
13.90	0it/s]	all	223	241	0.396	0.643	0.387	0.254
	Epoch	GPU mem	box_loss			Instances	Size	0.234
	4/50	1.46G	1.234	1.774	1.154	7	640:	100%  112/112 [00:07<00:00, 14.14it/
s]	4/ 50	1.400	1,234	1,774	1.154	,	040.	100%
-		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:01<00:00,
13.8	8it/s]		222	0.44	0.454	0.004	0.404	0.000
		all	223	241	0.451	0.804	0.494	0.339
	Epoch	GPU_mem	box_loss			Instances	Size	
- 1	5/50	1.48G	1.192	1.591	1.146	5	640:	100%  112/112 [00:08<00:00, 13.92it/
s]		Class	Tmages	Instances	Box(P	R	mΔP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.4	8it/s]	CIUSS	Tillages	1113 carrees	DOX(1	IV.	IIIAI 30	14,14 [00.00.00]
	-	all	223	241	0.447	0.767	0.455	0.305
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
	6/50	1.5G	1.213	1.525	1.142	12	640:	100%  112/112 [00:08<00:00, 13.90it/
s]								
1E 0	2it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
13.0	211/5]	all	223	241	0.436	0.669	0.447	0.303
	Epoch	GPU mem	box_loss	cls_loss		Instances	Size	
	7/50	1.51G	1.164	1.409	1.118	10		100%  112/112 [00:08<00:00, 13.97it/
s]	,,50	1,310	2.20	21.103	1,110	10	0.00	10000
		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.6	2it/s]	-11	222	241	0.464	0.724	0 503	0.254
		all	223	241	0.464	0.721	0.503	0.351
	Epoch	GPU_mem	box_loss	_	_	Instances	Size	
c 1	8/50	1.53G	1.147	1.362	1.115	9	640:	100%  100%  112/112 [00:07<00:00, 14.17it/
s]		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.1	Bit/s]							
		all	223	241	0.467	0.787	0.494	0.351
	Epoch	GPU mem	box_loss	cls_loss	dfl loss	Instances	Size	

	9/50	1.55G	1.136	1.33	1.111	7	640:	100%  112/112 [00:08<00:00, 13.77it/
s]		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.3	7it/s]							
		all	223	241	0.471	0.828	0.476	0.33
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
s]	10/50	1.56G	1.101	1.306	1.095	6	640:	100%  112/112 [00:08<00:00, 13.68it/
14.3	7it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
	_	all	223	241	0.458	0.815	0.496	0.362
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
s]	11/50	1.58G	1.076	1.249	1.087	11	640:	100%  112/112 [00:07<00:00, 14.05it/
	0it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
<b>1</b> -7.1	010/0]	all	223	241	0.462	0.825	0.488	0.345
	Epoch	GPU mem	box_loss	cls_loss	dfl loss	Instances	Size	
s]	12/50	1.6G	1.077	1.21	1.075	9	640:	100%  112/112 [00:07<00:00, 14.21it/
	r:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.4	5it/s]	all	223	241	0.445	0.873	0.475	0.341
	Epoch	GPU mem	box_loss			Instances	Size	0.341
	13/50	1.62G	_	_	1.075			100%  112/112 [00:08<00:00, 13.99it/
s]	13/30	1.020	1.066	1.221	1.0/5	9	640.	100%  112/112 [00.08<00.00, 15.9911/
2]		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.2	0it/s]		, and the second		·			· · · · · · · · · · · · · · · · · · ·
		all	223	241	0.429	0.825	0.457	0.316
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
s]	14/50	1.63G	1.083	1.207	1.087	7	640:	100%  112/112 [00:08<00:00, 13.73it/
	C:+/c]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14./	6it/s]	all	223	241	0.449	0.833	0.494	0.355
	Epoch	GPU mem	box_loss			Instances	Size	0.555
	Epocii	gro_illem	DOX_TOSS	CT2_T022	u+1_1088	Tils calices	2126	

	15/50	1.65G	1.036	1.169	1.072	5	640:	100%  112/112 [00:08<00:00, 13.82it/
s]		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:01<00:00,
13.9	3it/s]		222	0.44	0 407	0.040	0.470	
		all	223	241	0.437	0.848	0.479	0.34
	Epoch	GPU_mem	box_loss		<del>-</del>	Instances	Size	
s]	16/50	1.67G	1.023	1.17	1.063	6	640:	100%  100%  112/112 [00:07<00:00, 14.33it/
14 7	2it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
2107	210,5]	all	223	241	0.448	0.826	0.473	0.349
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
-1	17/50	1.69G	1.04	1.145	1.074	8	640:	100%  112/112 [00:08<00:00, 13.89it/
s]		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.6	5it/s]							
		all	223	241	0.447	0.852	0.451	0.319
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
s]	18/50	1.7G	1.016	1.149	1.063	11	640:	100%  112/112 [00:08<00:00, 13.66it/
		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.3	9it/s]							
		all	223	241	0.449	0.825	0.476	0.344
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
s]	19/50	1.72G	1.009	1.118	1.049	12	640:	100%  112/112 [00:08<00:00, 13.92it/
2]		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.1	8it/s]		Ü		`			
		all	223	241	0.441	0.862	0.466	0.339
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
د ا	20/50	1.74G	0.9867	1.095	1.037	7	640:	100%  112/112 [00:07<00:00, 14.01it/
s]		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:01<00:00,
13.7	4it/s]							
		all	223	241	0.437	0.87	0.458	0.321
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	

Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   14/14   [00:00<00:00, 14/95it/s]	-1	21/50	1.75G	0.9807	1.111	1.028	8	640:	100%  112/112 [00:08<00:00, 13.91it/
Report   GPU_mem   box_loss   cls_loss   dfl_loss   lnstances   cls_loss   cls_loss   dfl_loss   lnstances   cls_loss	s]	-:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
Epoch   GPU_mem   box_loss   cls_loss   dfl_loss   Instances   Size	14.9	oit/s]	all	223	241	0.472	0.826	0.485	0.344
22/50 1.776 0.9732 1.088 1.044 11 640: 100% 112/112 [00:08<00:00, 13.65it/s]  Class Images Instances Box(P R MAP50 MAP50-95): 100% 112/112 [00:08<00:00, 13.65it/s]  all 223 241 0.451 0.842 0.484 0.354  Epoch GPU_mem box_loss Instances Box(P R MAP50 MAP50-95): 100% 112/112 [00:08<00:00, 13.75it/s]  class Images Instances Box(P R MAP50 MAP50-95): 100% 112/112 [00:08<00:00, 13.75it/s]  class Images Instances Box(P R MAP50 MAP50-95): 100% 112/112 [00:08<00:00, 13.75it/s]  flat 223 241 0.428 0.906 0.453 0.323  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size 12/450 1.86 0.9884 1.059 1.034 9 640: 100% 112/112 [00:08<00:00, 13.85it/s]  class Images Instances Box(P R MAP50 MAP50-95): 100% 112/112 [00:08<00:00, 13.85it/s]  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size 12/50 1.826 0.9728 1.846 0.9728 1.846 1.045 0.879 0.468 0.342  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size 12/50 1.826 0.9728 1.846 1.045 0.879 0.468 0.342  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size 12/50 1.826 0.9728 1		Epoch							
S] 15.07it/s] 211			_			_			100%  112/112 [00:08<00:00, 13.65it/
15.07it/s]    Table   Carrest   Carr	s]								
Report	15 0	7:+/-7	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
Epoch   GPU_mem   box_loss   cls_loss   dfl_loss   Instances   Size	15.0	/1T/S]	all	223	241	0.451	0.842	0.484	0.354
1.796		Epoch							
S				_	_	<del>-</del>			100%  112/112 [00:08<00:00, 13.75it/
14.59it/s] all 223 241 0.428 0.906 0.453 0.323  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size 24/50 1.86 0.9884 1.059 1.034 9 640: l00%  112/112 [00:08<00:00, 13.85it/s]  Class Images Instances Box(P R MAP50 MAP50-95): l00%  14/14 [00:00<00:00, 13.85it/s]  14.40it/s]  all 223 241 0.455 0.879 0.468 0.342  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  Class Images Instances Box(P R MAP50 MAP50-95): l00%  112/112 [00:08<00:00, 13.90it/s]  s]  Class Images Instances Box(P R MAP50 MAP50-95): l00%  112/112 [00:08<00:00, 13.90it/s]  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  Class Images Instances Box(P R MAP50 MAP50-95): l00%  112/112 [00:08<00:00, 13.90it/s]  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  Class Images Instances Box(P R MAP50 MAP50-95): l00%  112/112 [00:08<00:00, 13.90it/s]  Class Images Instances Box(P R MAP50 MAP50-95): l00%  112/112 [00:08<00:00, 13.90it/s]  Class Images Instances Box(P R MAP50 MAP50-95): l00%  112/112 [00:08<00:00, 13.90it/s]	s]	,							· · · · · · · · · · · · · · · · · · ·
Epoch   GPU_mem   box_loss   cls_loss   dfl_loss   Instances   Size	14 5	D:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
Epoch	14.5	91T/S]	all	223	241	0.428	0.906	0.453	0.323
24/50		Epoch							
S]  Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   14/14 [00:00<00:00, 14.40it/s]  all 223 241 0.455 0.879 0.468 0.342  Epoch   GPU_mem   box_loss   cls_loss   dfl_loss   Instances   Size   25/50   1.826   0.9728   1.064   1.036   8   640: 100%   112/112 [00:08<00:00, 13.90it/s]    Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   14/14 [00:00<00:00, 14.94it/s]    Epoch   GPU_mem   box_loss   cls_loss   dfl_loss   Instances   Size   26/50   1.846   0.9582   1.028   1.037   6   640: 100%   112/112 [00:08<00:00, 13.92it/s]    Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   112/112 [00:08<00:00, 13.92it/s]    Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   112/112 [00:08<00:00, 13.92it/s]			_		_				100%  112/112 [00:08<00:00, 13.85it/
14.40it/s]  all 223 241 0.455 0.879 0.468 0.342  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  25/50 1.82G 0.9728 1.064 1.036 8 640: 100% 112/112 [00:08<00:00, 13.90it/s]  Class Images Instances Box(P R MAP50 MAP50-95): 100% 114/14 [00:00<00:00, 14.94it/s]  all 223 241 0.425 0.854 0.444 0.318  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  26/50 1.84G 0.9582 1.028 1.037 6 640: 100% 112/112 [00:08<00:00, 13.92it/s]  Class Images Instances Box(P R MAP50 MAP50-95): 100% 1112/112 [00:08<00:00, 13.92it/s]  14.53it/s]	s]	,							· · · · · · · · · · · · · · · · · · ·
Book   GPU_mem   box_loss   cls_loss   dfl_loss   Instances   Size   25/50   1.82G   0.9728   1.064   1.036   8   640: 100%   112/112 [00:08<00:00, 13.90it/s]     Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   14/14 [00:00<00:00, 14.94it/s]     Epoch   GPU_mem   box_loss   cls_loss   dfl_loss   Instances   Size     26/50   1.84G   0.9582   1.028   1.037   6   640: 100%   100%   112/112 [00:08<00:00, 13.92it/s]     Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   112/112 [00:08<00:00, 13.92it/s]     Size   Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   112/112 [00:08<00:00, 13.92it/s]     Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   14/14 [00:00<00:00, 13.92it/s]     Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   14/14 [00:00<00:00, 13.92it/s]     Class   Images   Instances   Box(P   R   mAP50   mAP50-95): 100%   14/14 [00:00<00:00, 13.92it/s]	1.4.40	D:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  25/50 1.826 0.9728 1.064 1.036 8 640: 100% 112/112 [00:08<00:00, 13.90it/s]  Class Images Instances Box(P R MAP50 MAP50-95): 100% 112/112 [00:08<00:00, 14.94it/s]  all 223 241 0.425 0.854 0.444 0.318  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  26/50 1.846 0.9582 1.028 1.037 6 640: 100% 112/112 [00:08<00:00, 13.92it/s]  Class Images Instances Box(P R MAP50 MAP50-95): 100% 1112/112 [00:08<00:00, 13.92it/s]  14.53it/s]	14.46	01t/S]	all	223	241	0.455	0.879	0.468	0.342
25/50 1.82G 0.9728 1.064 1.036 8 640: 100% 1112/112 [00:08<00:00, 13.90it/s]  Class Images Instances Box(P R MAP50 MAP50-95): 100% 1112/112 [00:08<00:00, 13.90it/s]  14.94it/s]  Box(P R MAP50 MAP50-95): 100% 1112/112 [00:08<00:00, 14.14/14 [00:00<00:00, 14.94it/s]  Box(P R MAP50 MAP50-95): 100% 1112/112 [00:08<00:00, 13.90it/s]  Box(P R MAP50 MAP50-95): 100% 1112/112 [00:08<00:00, 13.92it/s]  Class Images Instances Box(P R MAP50 MAP50-95): 100% 1112/112 [00:08<00:00, 13.92it/s]		Epoch	GPU mem	box loss	cls loss		Instances	Size	
Class Images Instances Box(P R mAP50 mAP50-95): 100% 14/14 [00:00<00:00, 14.94it/s]  all 223 241 0.425 0.854 0.444 0.318  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  26/50 1.84G 0.9582 1.028 1.037 6 640: 100% 112/112 [00:08<00:00, 13.92it/s]  Class Images Instances Box(P R mAP50 mAP50-95): 100% 114/14 [00:00<00:00, 14.53it/s]			_	_		_		640:	100%  112/112 [00:08<00:00, 13.90it/
14.94it/s] all 223 241 0.425 0.854 0.444 0.318  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size 26/50 1.84G 0.9582 1.028 1.037 6 640: 100% 112/112 [00:08<00:00, 13.92it/s]  Class Images Instances Box(P R mAP50 mAP50-95): 100% 14/14 [00:00<00:00, 14.53it/s]	s]								
all 223 241 0.425 0.854 0.444 0.318  Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size  26/50 1.84G 0.9582 1.028 1.037 6 640: 100% 112/112 [00:08<00:00, 13.92it/s]  Class Images Instances Box(P R mAP50 mAP50-95): 100% 14/14 [00:00<00:00, 14.53it/s]	14 0	1;+/c]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
26/50 1.84G 0.9582 1.028 1.037 6 640: 100%  112/112 [00:08<00:00, 13.92it/s]  Class Images Instances Box(P R mAP50 mAP50-95): 100%  14/14 [00:00<00:00, 14.53it/s]	14.94	+11/5]	all	223	241	0.425	0.854	0.444	0.318
26/50 1.84G 0.9582 1.028 1.037 6 640: 100%  112/112 [00:08<00:00, 13.92it/s]  Class Images Instances Box(P R mAP50 mAP50-95): 100%  14/14 [00:00<00:00, 14.53it/s]		Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
s] Class Images Instances Box(P R mAP50 mAP50-95): 100%  14/14 [00:00<00:00, 14.53it/s]			_	_	_	<del>-</del>			100%  112/112 [00:08<00:00, 13.92it/
14.53it/s]	s]								
•	1/ [	2i+/c1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
	14.0	211/2]	all	223	241	0.412	0.821	0.428	0.307
Epoch GPU_mem box_loss cls_loss dfl_loss Instances Size		Epoch	GPU_mem		cls_loss	dfl_loss	Instances	Size	

,	27/50	1.86G	0.9414	1.01	1.006	6	640:	100%  112/112 [00:08<00:00, 13.77it/
s]	1:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.4	1it/s]	all	223	241	0.447	0.872	0.479	0.346
	Epoch	GPU mem	box_loss			Instances	Size	
	28/50	1.87G	0.9205	1.012	1.008	7		100%  112/112 [00:08<00:00, 13.77it/
s]	•							
14.4	7:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.4	7it/s]	all	223	241	0.407	0.818	0.417	0.301
	Epoch	GPU mem	box loss			Instances	Size	
	29/50	1.89G	0.9018	0.9896	1.007	8		100%  112/112 [00:08<00:00, 13.66it/
s]	·							
14.2	7:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.3	7it/s]	all	223	241	0.443	0.886	0.487	0.353
	Epoch	GPU_mem				Instances	Size	
	30/50	1.91G	0.9058	0.9746	0.9978	10		100%  112/112 [00:08<00:00, 13.94it/
s]	·							
14.0	7:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.9	7it/s]	all	223	241	0.431	0.875	0.454	0.324
	Epoch	GPU mem	box loss			Instances	Size	
	31/50	1.92G	0.9254	0.9695	1.005	12		100%  112/112 [00:08<00:00, 13.72it/
s]								
14 5	2:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.5	2it/s]	all	223	241	0.411	0.873	0.419	0.3
	Epoch	GPU mem	box loss			Instances	Size	
	32/50	1.94G	0.9117	0.9401	1.012	12		100%  112/112 [00:08<00:00, 13.80it/
s]								
14.0	r:+/-1	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.8	5it/s]	all	223	241	0.429	0.856	0.447	0.329
	Epoch	GPU mem	box_loss			Instances	Size	=-
	-F 2 <b>c</b>						5	

,	33/50	1.96G	0.919	0.9647	1.004	12	640:	100%  112/112 [00:08<00:00, 13.60it/
s]		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
15.5	1it/s]	-11	222	241	0.431	0.064	0.427	0.300
		all	223	241		0.864	0.437	0.308
	Epoch	GPU_mem	box_loss	_	_	Instances	Size	
- 1	34/50	1.98G	0.8899	0.9355	1.004	12	640:	100%  112/112 [00:08<00:00, 13.84it/
s]		Class	Tmages	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.7	4it/s]	Class	Tillages	Tilstalices	DOX(F	IX.	IIIAF JO	14/14 [00.00\00.00]
	, ,	all	223	241	0.444	0.819	0.484	0.358
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
	35/50	1.99G	0.8797	0.9181	0.9893	3	640:	100%  112/112 [00:08<00:00, 13.85it/
s]								
		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.4	7it/s]	11	222	244	0 447	0.067	0.430	0.224
		all	223	241	0.417	0.867	0.439	0.321
	Epoch	GPU_mem	box_loss	_	_	Instances	Size	
,	36/50	2.01G	0.8788	0.9119	0.995	10	640:	100%  112/112 [00:08<00:00, 13.75it/
s]		Class	Tmagas	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.6	9it/s]	CIass	Tillages	Tilstalices	DOX (P	IV.	IIIAF 30	14/14 [00.00(00.00,
	, - ]	all	223	241	0.417	0.876	0.466	0.348
	Epoch	GPU mem	box loss	cls_loss	dfl loss	Instances	Size	
	37/50	2.03G	0.8827	0.8934	0.9974	8	640:	100%  112/112 [00:07<00:00, 14.04it/
s]	,							, , , , , , , , , , , , , , , , , , , ,
		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.9	7it/s]		222	0.44	0.400	0.000	0.40	
		all	223	241	0.432	0.888	0.43	0.308
	Epoch	GPU_mem	box_loss	_	_	Instances	Size	
_	38/50	2.04G	0.8463	0.8355	0.969	6	640:	100%  112/112 [00:08<00:00, 13.97it/
s]		Class	Tmagas	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.2	7it/s]	CIASS	Tillages	TIIS CALICES	BOX (P	K	IIIAPOU	14/14 [00:000000;
± T • Z	, 10, 3	all	223	241	0.434	0.847	0.458	0.341
	Epoch	GPU mem	box_loss	cls_loss	dfl loss	Instances	Size	
	-F 2 2	<u>-</u> •					5	

-1	39/50	2.06G	0.8752	0.8666	0.9928	10	640:	100%	112/112 [00:08<00:00, 13.84it/
s] 15.0	8it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95):	100%  14/14 [00:00<00:00,
	-	all	223	241	0.436	0.863	0.449	0.326	
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size		
	40/50	2.08G	0.8476	0.8286	0.9713	10	640:	100%	112/112 [00:08<00:00, 13.95it/
s] 14.5	2it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95):	100%  14/14 [00:00<00:00,
		all	223	241	0.423	0.849	0.453	0.329	

## Closing dataloader mosaic

albumentations: Blur(p=0.01, blur\_limit=(3, 7)), MedianBlur(p=0.01, blur\_limit=(3, 7)), ToGray(p=0.01, method='weighted\_averag e', num\_output\_channels=3), CLAHE(p=0.01, clip\_limit=(1.0, 4.0), tile\_grid\_size=(8, 8))

	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size		
	41/50	2.09G	0.7911	0.8011	0.9576	6	640:	100%	112/112 [00:08<00:00, 13.34it/
s]		61	T	T	D/D	<b>D</b>		ADEQ 05).	1000/
14.8	3it/s]	Class	Images	Instances	Box(P	R	mAP50	MAP50-95):	100%   14/14 [00:00<00:00,
		all	223	241	0.413	0.854	0.443	0.323	
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size		
	42/50	2.11G	0.8085	0.7583	0.966	4	640:	100%	112/112 [00:08<00:00, 13.71it/
s]			_			_			
1/ //	9it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95):	100%  14/14 [00:00<00:00,
14.4	510/3]	all	223	241	0.418	0.831	0.47	0.347	
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size		
	43/50	2.13G	0.7755	0.7419	0.9491	5	640:	100%	112/112 [00:08<00:00, 13.97it/
s]									
14 7	0;+/c]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95):	100%  14/14 [00:00<00:00,
14./	0it/s]	all	223	241	0.423	0.847	0.462	0.341	
								0.541	
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size		

7	44/50	2.14G	0.7623	0.7144	0.9374	5	640:	100%  112/112 [00:07<00:00, 14.11it/
s]	9it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
13.1	911/5]	all	223	241	0.425	0.81	0.498	0.367
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
s]	45/50	2.16G	0.7676	0.7012	0.9374	5	640:	100%  112/112 [00:08<00:00, 13.96it/
	6it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
		all	223	241	0.421	0.83	0.453	0.328
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
s]	46/50	2.18G	0.7764	0.6774	0.9387	5	640:	100%  112/112 [00:08<00:00, 13.83it/
		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
15.1	5it/s]	all	223	241	0.417	0.844	0.471	0.345
	- Fnoch							0.545
	Epoch	GPU_mem	box_loss			Instances	Size	100%
s]	47/50	2.2G	0.733	0.6544	0.9248	5	640;	100%  112/112 [00:08<00:00, 13.79it/
٥٦		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.9	3it/s]							
		all	223	241	0.421	0.819	0.498	0.368
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
-	48/50	2.21G	0.7352	0.6431	0.9247	5	640:	100%  112/112 [00:08<00:00, 13.85it/
s]		Class	Tmages	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
14.3	4it/s]	CIass	Illiages	Tils calices	DOX(F	IX.	IIIAF JO	14/14 [00.00\00.00]
	, ,	all	223	241	0.431	0.836	0.487	0.355
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
,	49/50	2.23G	0.7319	0.6326	0.9227	5	640:	100%  112/112 [00:07<00:00, 14.07it/
s]		Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:00<00:00,
15.1	6it/s]							
		all	223	241	0.43	0.828	0.476	0.35
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	

50/5	50 2.25G	0.7205	0.6098	0.9171	6	640:	100%	112/112 [00:08<00:00, 13.99it/
s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 1	14/14 [00:00<00:00,
14.69it/s]	J							
	all	223	241	0.425	0.817	0.47	0.347	

50 epochs completed in 0.130 hours.

Optimizer stripped from runs/detect/train3/weights/last.pt, 6.2MB

Optimizer stripped from runs/detect/train3/weights/best.pt, 6.2MB

Validating runs/detect/train3/weights/best.pt...

Ultralytics 8.3.170 

☑ Python-3.11.13 torch-2.6.0+cu124 CUDA:0 (NVIDIA A100-SXM4-40GB, 40507MiB)

Model summary (fused): 72 layers, 3,006,038 parameters, 0 gradients, 8.1 GFLOPs

10.63it/s]	Class	Images	Instances	Box(P	R	mAP50	mAP50-95): 100%  14/14 [00:01<00:00,
	all	223	241	0.42	0.82	0.499	0.367
	negative	142	154	0.545	0.708	0.591	0.437
	positive	81	87	0.296	0.931	0.407	0.298

Speed: 0.1ms preprocess, 0.9ms inference, 0.0ms loss, 1.7ms postprocess per image

Results saved to runs/detect/train3

ap class index: array([0, 1]) box: ultralytics.utils.metrics.Metric object confusion matrix: <ultralytics.utils.metrics.ConfusionMatrix object at 0x7b26fafc61d0> curves: ['Precision-Recall(B)', 'F1-Confidence(B)', 'Precision-Confidence(B)', 'Recall-Confidence(B)'] curves results: [[array([ 0, 0.001001, 0.002002, 0.003003, 0.004004, 0.005005, 0.006006, 0.0070 0.008008, 0.009009, 0.01001, 0.011011, 0.012012, 0.013013, 0.014014, 0.015015, 0.016016. 07, 0.017017, 0.018018, 0.019019, 0.02002, 0.021021, 0.022022. 0.023023. 0.029029, 0.024024. 0.025025. 0.026026, 0.027027, 0.028028, 0.03003. 0.031031. 0.032032. 0.035035, 0.038038, 0.033033, 0.034034, 0.036036, 0.037037, 0.039039, 0.04004, 0.041041, 0.04204 0.044044, 0.045045, 0.046046, 0.047047, 2, 0.043043, 0.049049, 0.05005, 0.051051, 0.052052, 0.048048. 0.053053, 0.054054. 0.055055. 0.056056. 0.057057, 0.058058, 0.059059, 0.06006, 0.061061, 0.062062, 0.063063, 0.064064, 0.065065, 0.06606 0.07007, 0.071071, 0.067067, 0.068068, 0.069069, 0.073073, 0.074074, 0.075075, 0.076076, 0.079079. 0.08008, 0.072072, 0.077077, 0.078078, 0.081081. 0.082082, 0.083083, 0.084084, 0.085085, 0.086086, 0.087087, 0.088088, 0.089089, 0.0900 0.093093, 0.094094, 0.091091, 0.092092, 0.095095, 0.096096, 0.097097, 0.098098, 0.099099, 0.1001, 0.1011, 0.1021, 0.1031, 0.1041, 0.10711, 0.11011, 0.10511, 0.10611, 0.10811, 0.10911, 0.11111, 0.11211, 0.11311, 0.11411, 0.11512, 0.11612, 0.11712, 0.11812, 0.11912, 0.12212, 0.12012, 0.12112, 0.12312, 0.12412, 0.12513, 0.12613, 0.12713, 0.12813, 0.12913, 0.13013, 0.13113, 0.13213, 0.13313, 0.13413, 0.13514, 0.13614. 0.13714. 0.13814, 0.13914, 0.14014, 0.14114, 0.14214, 0.14314, 0.14414, 0.14515, 0.14615, 0.14815, 0.14915, 0.15015, 0.15115, 0.15215, 0.14715, 0.15315, 0.15415, 0.15516, 0.15616, 0.15716, 0.15816, 0.15916, 0.16016, 0.16116, 0.16216, 0.16316, 0.16416, 0.16517, 0.16617, 0.16717, 0.16817, 0.16917, 0.17017, 0.17117, 0.17217, 0.17317, 0.17417, 0.17518, 0.17618, 0.17718, 0.17818, 0.17918, 0.18018, 0.18118, 0.18218, 0.18318, 0.18418, 0.18519, 0.18619, 0.19119, 0.18719, 0.18819, 0.18919, 0.19019, 0.19219, 0.19319, 0.19419, 0.1952, 0.1962, 0.1972, 0.1982, 0.1992, 0.2002, 0.2012, 0.2022, 0.2032, 0.2042, 0.20621, 0.20721, 0.20821, 0.20921, 0.21021, 0.20521, 0.21121, 0.21221, 0.21321, 0.21421, 0.21522, 0.21622, 0.21722, 0.21822, 0.21922, 0.22022, 0.22122, 0.22222, 0.22322, 0.22422, 0.22523, 0.22623, 0.22723, 0.22823, 0.22923, 0.23023, 0.23123, 0.23223, 0.23323, 0.23423, 0.23524, 0.23624, 0.23724, 0.23824, 0.23924, 0.24024, 0.24124, 0.24224, 0.24324, 0.24424, 0.24525, 0.24625, 0.24725, 0.24825, 0.25225, 0.25325, 0.24925, 0.25025, 0.25125, 0.25425, 0.25526, 0.25626, 0.25726, 0.25826, 0.25926, 0.26026, 0.26126, 0.26226, 0.26326, 0.26426, 0.26527, 0.26627, 0.26727, 0.26827, 0.26927, 0.27027, 0.27127, 0.27227,

	0.27427,	0.27528,		0.27728,	0.27828,	0.27928,	0.28028,	0.28128,	0.28228,
0.28328,	0.28428,	0.28529,	0.28629,	0.28729,					
	0.28829,	•					0.29429,		0.2963,
				0.3013,	0.3023,	0.3033,	0.3043,	0.30531,	0.30631,
0.30731,	0.30831,	0.30931,	0.31031,	0.31131,					
	0.31231,	-	0.31431,			0.31732,		0.31932,	0.32032,
0.32132,	0.32232,		0.32432,		0.32633,	0.32733,	0.32833,	0.32933,	0.33033,
0.33133,	0.33233,	0.33333,	0.33433,	0.33534,					
	0.33634,	•	0.33834,				0.34234,		
		0.34735,			0.35035,	0.35135,	0.35235,	0.35335,	0.35435,
0.35536,	0.35636,		0.35836,	0.35936,					
		0.36136,	-				0.36637,		
0.36937,			0.37237,	0.37337,	0.37437,	0.37538,	0.37638,	0.37738,	0.37838,
0.37938,	0.38038,	0.38138,	0.38238,	0.38338,					
	0.38438,		0.38639,				0.39039,		
0.39339,	0.39439,	0.3954,	0.3964,		0.3984,	0.3994,	0.4004,	0.4014,	0.4024,
0.4034,		0.40541,	0.40641,	0.40741,					
			0.41041,				0.41441,		
0.41742,	0.41842,	0.41942,	0.42042,		0.42242,	0.42342,	0.42442,	0.42543,	0.42643,
0.42743,	0.42843,	0.42943,	0.43043,	0.43143,					
	0.43243,	0.43343,	0.43443,	0.43544,	0.43644,	0.43744,	0.43844,	0.43944,	0.44044,
0.44144,	0.44244,	0.44344,	0.44444,	0.44545,	0.44645,	0.44745,	0.44845,	0.44945,	0.45045,
0.45145,	0.45245,	0.45345,	0.45445,	0.45546,					
	0.45646,	•	0.45846,	0.45946,	0.46046,	0.46146,	0.46246,	0.46346,	0.46446,
0.46547,	0.46647,	0.46747,	0.46847,	0.46947,	0.47047,	0.47147,	0.47247,	0.47347,	0.47447,
0.47548,	0.47648,	0.47748,	0.47848,	0.47948,					
	0.48048,	0.48148,	0.48248,	0.48348,	0.48448,	0.48549,	0.48649,	0.48749,	0.48849,
0.48949,	0.49049,	0.49149,	0.49249,	0.49349,	0.49449,	0.4955,	0.4965,	0.4975,	0.4985,
0.4995,	0.5005,	0.5015,	0.5025,	0.5035,					
	0.5045,	0.50551,	0.50651,	0.50751,	0.50851,	0.50951,	0.51051,	0.51151,	0.51251,
0.51351,	0.51451,	-	0.51652,	0.51752,	0.51852,	0.51952,	0.52052,	0.52152,	0.52252,
0.52352,	0.52452,	0.52553,	0.52653,	0.52753,					
	0.52853,	0.52953,	0.53053,	0.53153,	0.53253,	0.53353,	0.53453,	0.53554,	0.53654,
0.53754,	0.53854,	0.53954,	0.54054,	0.54154,	0.54254,	0.54354,	0.54454,	0.54555,	0.54655,
0.54755,	,		0.55055,	•					
				0.55556,					
				0.56557,	0.56657,	0.56757,	0.56857,	0.56957,	0.57057,
0.57157,	0.57257,	0.57357,	0.57457,	0.57558,					
	0.57658,	0.57758,	0.57858,	0.57958,	0.58058,	0.58158,	0.58258,	0.58358,	0.58458,
0.58559,	0.58659,	0.58759,	0.58859,	0.58959,	0.59059,	0.59159,	0.59259,	0.59359,	0.59459,
0.5956,	0.5966,	0.5976,	0.5986,	0.5996,					

0 60061	0.6006,							0.60761,	
0.60961,	0.61061, 0.62062,	0.61161,	0.61261,	0.61361,	0.01401,	0.01302,	0.01002,	0.61762,	0.61862,
0.61962,	,	0.62162,	0.62262,	0.62362,	0 62062	0 62062	0 62062	0 62162	0 62262
0 62262	0.62462,	0.62563, 0.63564,	0.62663,			0.62963,		0.63163,	
0.63363,		0.64565,	0.63664, 0.64665,		0.63864,	0.03904,	0.04004,	0.04104,	0.04204,
0.64364,	0.64464,	•	•	0.64765,	0 65365	0.65365,	0 65165	0 65566	0 65666
0.65766,	0.64865,	0.64965,	0.65065,	0.65165,				0.65566,	0.65666,
-	0.65866,	0.65966,	0.66066, 0.67067,		0.66266,	0.00300,	0.00400,	0.00307,	0.00007,
0.66767,	0.66867,	0.66967,		0.67167,	0 67669	0 67769	0 67060	0 67069	0 60060
0 60160	0.67267, 0.68268,	0.67367,	0.67467,	0.67568,	0.68669,	0.67768,		0.67968,	0.68068,
0.68168, 0.69169,		0.68368,	0.68468,		0.00009,	0.00709,	0.00009,	0.00909,	0.09009,
0.09109,	0.69269, 0.6967,	0.69369, 0.6977,	0.69469, 0.6987,	0.6957,	0.7007,	0 7017	0 7027	0.7037,	0.7047,
0.70571,	0.70671,				0.71071,				
0.70571,	0.71672,	0.70771,	0.70871,	0.71971,	0.71071,	0.71171,	0.71271,	0.71371,	0.71471,
0.71372,	0.71072,		0.71872,	•	0 72472	0 72573	0 72673	0.72773,	0.72873,
0.72973,	0.73073,	0.72172,	0.73273,	-	0.73473,				
0.73974,	0.74074,	0.73173,	0.73273,	0.74374,	0.75475,	0.75574,	0.75074,	0.73774,	0.73074,
0.75574,	0.74474,		0.74675,		0.74875,	0 74975	0 75075	0 75175	0.75275,
0.75375,	•	0.75576,	0.75676,		0.75876,				
0.76376,	0.76476,	0.76577,	0.76677,	0.76777,	0.75070,	0.75570,	0.70070,	0.70170,	0.70270,
0170370,	0.76877,		0.77077,		0.77277.	0.77377,	0.77477.	0.77578,	0.77678,
0.77778,	0.77878,	0.77978,	0.78078,	0.78178,				0.78579,	
0.78779,	0.78879,	0.78979,	0.79079,	0.79179,	01702709	0170370,	01,01,0,	0.,03,3,	01,00,0,
01/0//5,	0.79279,	0.79379,	0.79479,	0.7958,	0.7968,	0.7978,	0.7988,	0.7998,	0.8008,
0.8018,	0.8028,	0.8038,	0.8048,	0.80581,	0.80681,	0.80781,			0.81081,
0.81181,	0.81281,	0.81381,	0.81481,	0.81582,	0,0000_,	0,007,0=,	0.0000_,	0.00000_,	0.000000
,	0.81682,		0.81882,	0.81982,	0.82082.	0.82182,	0.82282.	0.82382,	0.82482,
0.82583,	•	0.82783,	0.82883,		0.83083,				
0.83584,	0.83684,	0.83784,	0.83884,	0.83984,		,	,	•	ĺ
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	0.79279,	0.79379,	0.79479,	0.7958,	0.7968,	0.7978,	0.7988,	0.7998,	0.8008,
0.8018,	0.8028,	0.8038,	0.8048,	0.80581,	0.80681,	0.80781,	0.80881,	0.80981,	0.81081,
0.81181,	0.81281,	0.81381,	0.81481,	0.81582,					
	0.81682,	0.81782,	0.81882,	0.81982,	0.82082,	0.82182,	0.82282,	0.82382,	0.82482,
0.82583,	0.82683,	0.82783,	0.82883,	0.82983,	0.83083,	0.83183,	0.83283,	0.83383,	0.83483,

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                                                                                         0]]), 'Confidence', 'Recall']]
fitness: np.float64(0.38034850863816727)
keys: ['metrics/precision(B)', 'metrics/recall(B)', 'metrics/mAP50(B)', 'metrics/mAP50-95(B)']
maps: array([
                0.43658.
                              0.297771)
names: {0: 'negative', 1: 'positive'}
nt per class: array([154, 87])
nt per image: array([142, 81])
results dict: {'metrics/precision(B)': np.float64(0.42049937790243863), 'metrics/recall(B)': np.float64(0.8195621356540896),
'metrics/mAP50(B)': np.float64(0.4988821680458858), 'metrics/mAP50-95(B)': np.float64(0.3671781020373096), 'fitness': np.floa
t64(0.38034850863816727)}
save dir: PosixPath('runs/detect/train3')
speed: {'preprocess': 0.14256646636873777, 'inference': 0.942560771301591, 'loss': 0.000536044844227643, 'postprocess': 1.686
6067219723135}
stats: {'tp': [], 'conf': [], 'pred cls': [], 'target cls': [], 'target img': []}
task: 'detect'
```

In [ ]: metrics = model.val()
 print(metrics)

Ultralytics 8.3.170 Python-3.11.13 torch-2.6.0+cu124 CUDA:0 (NVIDIA A100-SXM4-40GB, 40507MiB)

Model summary (fused): 72 layers, 3,006,038 parameters, 0 gradients, 8.1 GFLOPs

val: Fast image access (ping: 0.0±0.0 ms, read: 178.4±90.8 MB/s, size: 3.4 KB)

val: Scanning /content/datasets/brain-tumor/valid/labels.cache... 223 images, 0 backgrounds, 0 corrupt: 100% 223/22
3 [00:00<?, ?it/s]

Class Images Instances Box(P R mAP50 mAP50-95): 100% 28/28 [00:01<00:00, 17.38it/s]

all	223	241	0.42	0.819	0.499	0.367
negative	142	154	0.545	0.708	0.591	0.436
positive	81	87	0.296	0.931	0.408	0.297

Speed: 0.6ms preprocess, 2.3ms inference, 0.0ms loss, 1.0ms postprocess per image Results saved to runs/detect/train32 ultralvtics.utils.metrics.DetMetrics object with attributes:

0.22523,

0.23524,

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0.23624,

0.22723,

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0.23023,

0.23123,

0.23223,

0.23323,

0.23423,

ap class index: array([0, 1]) box: ultralytics.utils.metrics.Metric object confusion matrix: <ultralytics.utils.metrics.ConfusionMatrix object at 0x7b26dda6ce10> curves: ['Precision-Recall(B)', 'F1-Confidence(B)', 'Precision-Confidence(B)', 'Recall-Confidence(B)'] curves results: [[array([ 0, 0.001001, 0.002002, 0.003003, 0.004004, 0.005005, 0.006006, 0.00700 0.009009, 0.012012, 7, 0.008008, 0.01001, 0.011011, 0.013013, 0.014014, 0.015015. 0.016016, 0.01 0.018018, 7017, 0.019019, 0.02002, 0.021021, 0.022022, 0.023023, 0.024024, 0.025025, 0.026026, 0.027027, 0.028028, 0.029029, 0.03003, 0.031031, 0.032032, 0.033033, 0.034034, 0.035035, 0.036036, 0.037037, 0.038038. 0.039039, 0.04004. 0.041041. 0.042042, 0.043043, 0.044044, 0.045045, 0.046046, 0.047047, 0.048048, 0.049049, 0.054054, 0.051051, 0.052052, 0.053053, 0.055055, 0.056056, 0.05005, 0.058058, 0.059059, 0.057057, 0.06006, 0.061061, 0.062062, 0.063063, 0.064064, 0.065065, 0.066066, 0.071071, 0.067067, 0.068068, 0.069069, 0.07007, 0.072072, 0.076076, 0.073073, 0.075075, 0.077077, 0.078078, 0.08008, 0.074074, 0.079079, 0.081081, 0.082082, 0.083083, 0.085085, 0.086086, 0.087087, 0.088088, 0.089089, 0.09009, 0.084084, 0.091091, 0.092092, 0.093093, 0.094094, 0.095095, 0.096096, 0.097097, 0.098098, 0.099099, 0.1001, 0.1011, 0.1021, 0.1031, 0.1041, 0.10511, 0.11011, 0.11111, 0.11211, 0.11311, 0.11411, 0.10611, 0.10711, 0.10811, 0.10911, 0.11512, 0.11612, 0.11712, 0.11812, 0.11912, 0.12012, 0.12112, 0.12212, 0.12312, 0.12513, 0.12613, 0.12713, 0.12813, 0.12412, 0.13413, 0.13514, 0.13614, 0.13714, 0.13814, 0.12913, 0.13013, 0.13113, 0.13213, 0.13313, 0.13914, 0.14014, 0.14114, 0.14214, 0.14314, 0.14414, 0.14515, 0.14715, 0.14815, 0.14915, 0.15015, 0.15115, 0.15215, 0.14615, 0.15716, 0.15315, 0.15415, 0.15516, 0.15616, 0.15816, 0.15916, 0.16016, 0.16116, 0.16216, 0.16316, 0.16416, 0.16517, 0.16617, 0.16717, 0.16817, 0.16917, 0.17117, 0.17217, 0.17317, 0.17417, 0.17518, 0.17618, 0.17017, 0.18619, 0.17718, 0.17818, 0.17918, 0.18018, 0.18118, 0.18218, 0.18318, 0.18418, 0.18519, 0.19119, 0.18719, 0.18819, 0.18919, 0.19019, 0.19219, 0.19319, 0.19419, 0.1952, 0.1962, 0.1972, 0.1982, 0.1992, 0.2002, 0.2012, 0.2022, 0.20521, 0.20621, 0.20721, 0.20821, 0.20921, 0.21021, 0.2032, 0.2042, 0.21221, 0.21421, 0.21522, 0.21121, 0.21321, 0.21622, 0.21722, 0.21822, 0.21922, 0.22022, 0.22122, 0.22222, 0.22322, 0.22422,

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0.27327,			0.27628,						
0.28328,	0.28428,		0.28629,		•	-	•	•	•
	0.28829,		0.29029,	0.29129,	0.29229,	0.29329,	0.29429,	0.2953,	0.2963,
0.2973,	0.2983,	0.2993,	0.3003,	0.3013,	0.3023,	0.3033,	0.3043,	0.30531,	0.30631,
0.30731,	0.30831,	0.30931,	0.31031,						
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0.33133,	0.33233,	0.33333,	0.33433,	0.33534,					
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0.35536,	0.35636,	0.35736,	0.35836,	0.35936,					
	0.36036,	0.36136,	0.36236,	0.36336,	0.36436,	0.36537,	0.36637,	0.36737,	0.36837,
0.36937,	0.37037,	0.37137,	0.37237,	0.37337,	0.37437,	0.37538,	0.37638,	0.37738,	0.37838,
0.37938,	0.38038,	0.38138,	0.38238,	0.38338,					
	0.38438,	0.38539,	0.38639,	0.38739,	0.38839,	0.38939,	0.39039,	0.39139,	0.39239,
0.39339,	0.39439,	0.3954,	0.3964,	0.3974,	0.3984,	0.3994,	0.4004,	0.4014,	0.4024,
0.4034,	0.4044,	0.40541,	0.40641,	0.40741,					
	0.40841,	0.40941,	0.41041,	0.41141,	0.41241,	0.41341,	0.41441,	0.41542,	0.41642,
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0.42743,	0.42843,	0.42943,	0.43043,	0.43143,					
	0.43243,	0.43343,	0.43443,	0.43544,	0.43644,	0.43744,	0.43844,	0.43944,	0.44044,
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0.45145,	0.45245,	0.45345,	0.45445,	0.45546,					
	0.45646,	0.45746,	0.45846,	0.45946,	0.46046,	0.46146,	0.46246,	0.46346,	0.46446,
0.46547,	0.46647,		0.46847,	0.46947,	0.47047,	0.47147,	0.47247,	0.47347,	0.47447,
0.47548,	0.47648,	0.47748,	0.47848,	•					
	0.48048,	-	0.48248,		0.48448,				
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		0.50551,			0.50851,				
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0.52352,	0.52452,		0.52653,	0.52753,					
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0.53754,		0.53954,			0.54254,	0.54354,	0.54454,	0.54555,	0.54655,
0.54755,			0.55055,	0.55155,					
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0.57157,	0.57257,	0.57357,	0.57457,	0.57558,					
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0.5956,	0.5966,	0.5976,	0.5986,	0.5996,					
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0.64364,	0.64464,	0.64565,	0.64665,	0.64765,					
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0.66767,	0.66867,	0.66967,	0.67067,	0.67167,					
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0.69169,	0.69269,	0.69369,	0.69469,	0.6957,					
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0.73974,	0.74074,	0.74174,	0.74274,	0.74374,					
	0.74474,	0.74575,	0.74675,	0.74775,	0.74875,	0.74975,	0.75075,	0.75175,	0.75275,
0.75375,	0.75475,	0.75576,	0.75676,	0.75776,	0.75876,	0.75976,	0.76076,	0.76176,	0.76276,
0.76376,	0.76476,	0.76577,	0.76677,	0.76777,					
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0.78779,	0.78879,	0.78979,	0.79079,	0.79179,					
	0.79279,	0.79379,	0.79479,	0.7958,	0.7968,	0.7978,	0.7988,	0.7998,	0.8008,
0.8018,	0.8028,	0.8038,	0.8048,	0.80581,	0.80681,	0.80781,	0.80881,	0.80981,	0.81081,
0.81181,	0.81281,	0.81381,	0.81481,	0.81582,					
	0.81682,	0.81782,	0.81882,	0.81982,	0.82082,	0.82182,	0.82282,	0.82382,	0.82482,
0.82583,	0.82683,	0.82783,	0.82883,	0.82983,	0.83083,	0.83183,	0.83283,	0.83383,	0.83483,
0.83584,	0.83684,	0.83784,	0.83884,	0.83984,					
	0.84084,	0.84184,	0.84284,	0.84384,	0.84484,	0.84585,	0.84685,	0.84785,	0.84885,
0.84985,	0.85085,	0.85185,	0.85285,	0.85385,	0.85485,			0.85786,	0.85886,
0.85986,	0.86086,	0.86186,	0.86286,						
_	0.86486,	0.86587,	0.86687,	-	0.86887,	0.86987,	0.87087,	0.87187,	0.87287,
0.87387,	0.87487,		0.87688,	0.87788,	0.87888,	-	-		0.88288,
0.88388,	0.88488,	0.88589,	0.88689,	0.88789,	,	,	,	•	,
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0.37938,	0.38038,	0.38138,	0.38238,	0.38338,					
	0.38438,	0.38539,	0.38639,	0.38739,	0.38839,	0.38939,	0.39039,	0.39139,	0.39239,
0.39339,	0.39439,	0.3954,	0.3964,	0.3974,	0.3984,	0.3994,	0.4004,	0.4014,	0.4024,
0.4034,			0.40641,						
			0.41041,	0.41141,	0.41241,	0.41341,	0.41441,	0.41542,	0.41642,
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0.42743,	0.42843,	0.42943,	0.43043,	0.43143,					
			0.43443,						
			0.44444,		0.44645,	0.44745,	0.44845,	0.44945,	0.45045,
0.45145,			0.45445,						
			0.45846,						
0.46547,	0.46647,	0.46747,	0.46847,	0.46947,	0.47047,	0.47147,	0.47247,	0.47347,	0.47447,

0.47548,	0.47648,	0.47748,	0.47848,	0.47948,					
	0.48048,	0.48148,	0.48248,	0.48348,	0.48448,	0.48549,	0.48649,	0.48749,	0.48849,
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0.52352,	0.52452,	0.52553,	0.52653,	0.52753,					
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0.53754,	0.53854,	0.53954,	0.54054,	0.54154,	0.54254,	0.54354,	0.54454,	0.54555,	0.54655,
0.54755,	0.54855,	0.54955,	0.55055,	0.55155,					
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0.56156,	0.56256,	0.56356,	0.56456,	0.56557,	0.56657,	0.56757,	0.56857,	0.56957,	0.57057,
0.57157,	0.57257,	0.57357,	0.57457,	0.57558,					
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0.58559,	0.58659,	0.58759,	0.58859,	0.58959,	0.59059,	0.59159,	0.59259,	0.59359,	0.59459,
0.5956,	0.5966,	0.5976,	0.5986,	0.5996,					
	0.6006,	0.6016,	0.6026,	0.6036,	0.6046,	0.60561,	0.60661,	0.60761,	0.60861,
0.60961,	0.61061,	0.61161,	0.61261,	0.61361,	0.61461,	0.61562,	0.61662,	0.61762,	0.61862,
0.61962,	0.62062,	0.62162,	0.62262,	0.62362,					
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0.64364,	0.64464,	0.64565,	0.64665,	0.64765,					
	0.64865,	0.64965,	0.65065,	0.65165,	0.65265,	0.65365,	0.65465,	0.65566,	0.65666,
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0.66767,	0.66867,	0.66967,	0.67067,	0.67167,					
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0.73974,	0.74074,	0.74174,	0.74274,	0.74374,					
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fitness: np.float64(0.37978771874022627)
keys: ['metrics/precision(B)', 'metrics/recall(B)', 'metrics/mAP50(B)', 'metrics/mAP50-95(B)']
maps: array([
                 0.43559,
                              0.29742])
names: {0: 'negative', 1: 'positive'}
nt per class: array([154, 87])
nt per image: array([142, 81])
results dict: {'metrics/precision(B)': np.float64(0.4204970296949163), 'metrics/recall(B)': np.float64(0.8194133452754142), 'me
trics/mAP50(B)': np.float64(0.4993339060856102), 'metrics/mAP50-95(B)': np.float64(0.3665048090351836), 'fitness': np.float64
(0.37978771874022627)}
save dir: PosixPath('runs/detect/train32')
speed: {'preprocess': 0.5868581704046362, 'inference': 2.3020288565027593, 'loss': 0.0011525201774228388, 'postprocess': 0.9737
175291459123}
stats: {'tp': [], 'conf': [], 'pred cls': [], 'target cls': [], 'target img': []}
task: 'detect'
```

```
In [ ]: results = model.predict('datasets/brain-tumor/valid/test/metastasis-6.jpg', conf=0.25, save=True)
    image 1/1 /content/datasets/brain-tumor/valid/test/metastasis-6.jpg: 640x480 1 positive, 10.0ms
    Speed: 3.2ms preprocess, 10.0ms inference, 2.0ms postprocess per image at shape (1, 3, 640, 480)
    Results saved to runs/detect/train317

In [ ]: import matplotlib.pyplot as plt

# Convertir La imagen con Los resultados a numpy y mostrar
    plt.imshow(results[0].plot()) # .plot() dibuja Las cajas en La imagen
    plt.axis('off')
    plt.show()
```

