Import necessary libraries

In [9]:
```
import torch
from ultralytics import YOLO
import numpy as np
import os
import random
import glob
import shutil
import json
import yaml
from pprint import pprint
from pathlib import Path
```

Check CUDA availability

In [10]:
```
# Check if CUDA is available
cuda_available = torch.cuda.is_available()
print("CUDA Available:", cuda_available)

# If CUDA is available, print details
if cuda_available:
    DEVICE = torch.cuda.current_device()
    device_name = torch.cuda.get_device_name(DEVICE)
    print(f"Device Name: {device_name}")

else:
    print("CUDA is not available. Please check your GPU drivers and CUDA ins
```

```
CUDA Available: True
Device Name: NVIDIA GeForce RTX 5070 Ti
```

Global Configurations

In [16]:
```
# Set the random seed for reproducibility
RANDOM_SEED = 300188

random.seed(RANDOM_SEED)
np.random.seed(RANDOM_SEED)
torch.manual_seed(RANDOM_SEED)
torch.cuda.manual_seed_all(RANDOM_SEED)

# Dataset directory
DATASET_DIR = "datasets/Vehicle-License-Plate-Detection"
# YAML config for dataset splits and class names
DATA_YAML = os.path.join(DATASET_DIR, "data.yaml")

# Unique project identifier
PROJECT_NAME = "vehicle-license-plate-detection"
# Which version of the dataset to use
```

```
DATASET_VERSION = "near-complete"
# Tag for this set of hyperparameters / training settings
EXPERIMENT_NAME = "imgsz1280"

RUN_DIR = os.path.join(PROJECT_NAME, DATASET_VERSION, EXPERIMENT_NAME)

# Base folder for saving evaluation outputs
EVALUATION_DIR = os.path.join(RUN_DIR, "evaluation")
# Base folder for saving model architecture & hyperparameters
ARCHITECTURE_DIR = os.path.join(RUN_DIR, "architecture")

# Location of the best-performing weights file of the trained model
TRAINED_MODEL_WEIGHTS = os.path.join(RUN_DIR, "weights/best.onnx")
```

Dataset Splitting

In [17]:

```
# ── CONFIG ──────────────────────────────────────────────────────────
TRAIN_IMG_DIR  = os.path.join(DATASET_DIR, "train", "images")
TRAIN_LBL_DIR  = os.path.join(DATASET_DIR, "train", "labels")
VAL_IMG_DIR    = os.path.join(DATASET_DIR, "valid", "images")
VAL_LBL_DIR    = os.path.join(DATASET_DIR, "valid", "labels")
TEST_IMG_DIR   = os.path.join(DATASET_DIR, "test",  "images")
TEST_LBL_DIR   = os.path.join(DATASET_DIR, "test",  "labels")

# Split ratios
TRAIN_RATIO = 7
VAL_RATIO   = 1
# (we leave TEST untouched, so its ratio of 2/10 is implicit)

RANDOM_SEED = 42
random.seed(RANDOM_SEED)

# 1️⃣ Ensure split directories exist
for d in (TRAIN_IMG_DIR, TRAIN_LBL_DIR, VAL_IMG_DIR, VAL_LBL_DIR):
    os.makedirs(d, exist_ok=True)

# 2️⃣ Gather current train & valid images
train_imgs_before = glob.glob(os.path.join(TRAIN_IMG_DIR, "*.jpg")) + \
                    glob.glob(os.path.join(TRAIN_IMG_DIR, "*.png"))
val_imgs_before   = glob.glob(os.path.join(VAL_IMG_DIR,   "*.jpg")) + \
                    glob.glob(os.path.join(VAL_IMG_DIR,   "*.png"))

# 3️⃣ Compute how many should be in valid after split
total_train_valid = len(train_imgs_before) + len(val_imgs_before)
desired_val_count = int(total_train_valid * VAL_RATIO / (TRAIN_RATIO + VAL_R
n_val_to_move     = max(0, desired_val_count - len(val_imgs_before))

# 4️⃣ Shuffle and pick from train
random.shuffle(train_imgs_before)
val_selection = train_imgs_before[:n_val_to_move]

# 5️⃣ Move images & corresponding labels
for img_path in val_selection:
    fname    = os.path.basename(img_path)
```

```
    stem     = os.path.splitext(fname)[0]
    lbl_src  = os.path.join(TRAIN_LBL_DIR, stem + ".txt")

    # image → valid/images
    shutil.move(img_path, os.path.join(VAL_IMG_DIR, fname))

    # label → valid/labels (if exists)
    if os.path.exists(lbl_src):
        shutil.move(lbl_src, os.path.join(VAL_LBL_DIR, stem + ".txt"))

# 6️⃣ Report final counts
final_train_count = len(glob.glob(os.path.join(TRAIN_IMG_DIR, "*.jpg"))) + \
                    len(glob.glob(os.path.join(TRAIN_IMG_DIR, "*.png")))
final_val_count   = len(glob.glob(os.path.join(VAL_IMG_DIR,   "*.jpg"))) + \
                    len(glob.glob(os.path.join(VAL_IMG_DIR,   "*.png")))
final_test_count  = len(glob.glob(os.path.join(TEST_IMG_DIR,  "*.jpg"))) + \
                    len(glob.glob(os.path.join(TEST_IMG_DIR,  "*.png")))

print("Split complete:")
print(f"  train: {final_train_count} images")
print(f"  valid: {final_val_count} images")
print(f"  test : {final_test_count} images")
```

```
Split complete:
  train: 1279 images
  valid: 182 images
  test : 253 images
```

In [ ]:

```
# ── CONFIG ──────────────────────────────────────────────────────────
TRAIN_IMG_DIR = os.path.join(DATASET_DIR, "train", "images")
TRAIN_LBL_DIR = os.path.join(DATASET_DIR, "train", "labels")
VAL_IMG_DIR   = os.path.join(DATASET_DIR, "valid",  "images")
VAL_LBL_DIR   = os.path.join(DATASET_DIR, "valid",  "labels")
TEST_IMG_DIR  = os.path.join(DATASET_DIR, "test",  "images")
TEST_LBL_DIR  = os.path.join(DATASET_DIR, "test",  "labels")

# Split ratios (train:7, val:2, test:1) out of total parts
VAL_RATIO = 2

# Ensure reproducibility
random.seed(RANDOM_SEED)

# 1️⃣ Ensure all split directories exist
for d in (TRAIN_IMG_DIR, TRAIN_LBL_DIR, VAL_IMG_DIR, VAL_LBL_DIR, TEST_IMG_D
    os.makedirs(d, exist_ok=True)

# 2️⃣ Count current images in each split
train_imgs_before = glob.glob(os.path.join(TRAIN_IMG_DIR, "*.jpg")) + glob.g
val_imgs_before   = glob.glob(os.path.join(VAL_IMG_DIR,   "*.jpg")) + glob.g
test_imgs_before  = glob.glob(os.path.join(TEST_IMG_DIR,  "*.jpg")) + glob.g

total_images = len(train_imgs_before) + len(val_imgs_before) + len(test_imgs
# Desired count for validation based on overall ratio
desired_val   = int(total_images * VAL_RATIO / 10)

# 3️⃣ Shuffle remaining train images
```

```
all_train_imgs = train_imgs_before.copy()
random.shuffle(all_train_imgs)

# 4️⃣ Determine how many to move into validation
n_val_to_move = max(0, desired_val - len(val_imgs_before))
val_to_move   = all_train_imgs[:n_val_to_move]

# 5️⃣ Move selected images and corresponding labels
for img_path in val_to_move:
    fname   = os.path.basename(img_path)
    stem    = os.path.splitext(fname)[0]
    lbl_src = os.path.join(TRAIN_LBL_DIR, stem + ".txt")

    # Move image file to validation folder
    shutil.move(img_path, os.path.join(VAL_IMG_DIR, fname))

    # Move label file if it exists
    if os.path.exists(lbl_src):
        shutil.move(lbl_src, os.path.join(VAL_LBL_DIR, stem + ".txt"))

# 6️⃣ Report final counts
final_train_count = len(glob.glob(os.path.join(TRAIN_IMG_DIR, "*.jpg"))) + l
final_val_count   = len(glob.glob(os.path.join(VAL_IMG_DIR,   "*.jpg"))) + l
final_test_count  = len(glob.glob(os.path.join(TEST_IMG_DIR,  "*.jpg"))) + l

print("Split complete:")
print(f"  train: {final_train_count} images")
print(f"  valid:   {final_val_count} images")
print(f"  test:  {final_test_count} images")
```

```
Split complete:
  train: 1290 images
  valid:   171 images
  test:  253 images
```

Ensure full path dataset in data.yaml

In [18]:

```
BASE_DIR = Path(os.getcwd()) / DATASET_DIR

# 1️⃣ Load existing YAML
with open(DATA_YAML, "r") as f:
    config = yaml.safe_load(f)

print("Original paths:")
pprint({k: config.get(k) for k in ("train", "val", "test")})

# 2️⃣ Update train/val/test entries to absolute POSIX paths with uppercase dr
for split in ("train", "val", "test"):
    orig = config.get(split, "")
    if orig.startswith(".."):
        # Build new path by appending subpath beyond '..'
        rel = Path(orig)
        parts = rel.parts[1:]  # drop leading '..'
        new_path = BASE_DIR.joinpath(*parts)
    else:
```

```
        new_path = Path(orig)
    # Convert to forward-slash style
    path_str = new_path.as_posix()
    # Ensure drive letter is uppercase (e.g. 'c:/...' → 'C:/...')
    if len(path_str) >= 2 and path_str[1] == ':' and path_str[0].islower():
        path_str = path_str[0].upper() + path_str[1:]
    config[split] = path_str

print("\nUpdated paths:")
pprint({k: config.get(k) for k in ("train", "val", "test")})

# 3️⃣ Overwrite data.yaml in place
with open(DATA_YAML, "w") as f:
    yaml.dump(config, f, sort_keys=False)

print(f"\nModified YAML saved directly to '{DATA_YAML}'")
```

```
Original paths:
{'test': '../test/images', 'train': '../train/images', 'val': '../valid/imag
es'}

Updated paths:
{'test': 'C:/Users/herma/dev/IS/yolo/datasets/Vehicle-License-Plate-Detectio
n/test/images',
 'train': 'C:/Users/herma/dev/IS/yolo/datasets/Vehicle-License-Plate-Detecti
on/train/images',
 'val': 'C:/Users/herma/dev/IS/yolo/datasets/Vehicle-License-Plate-Detectio
n/valid/images'}

Modified YAML saved directly to 'datasets/Vehicle-License-Plate-Detection\da
ta.yaml'
```

Hyperparameter Tuning

In [ ]:
```
NUMBER_OF_EPOCHS = 500
IMAGE_SIZE = 1280
BATCH_SIZE = 16
PATIENCE = 50
NUM_OF_WORKERS = 8
```

In [14]:
```
HYPERPARAMS = {
    "project": PROJECT_NAME,  # Name of the project
    "name": os.path.join(DATASET_VERSION, EXPERIMENT_NAME),  # Name of the t
    "data": DATA_YAML, # Path to the dataset configuration file
    "epochs": NUMBER_OF_EPOCHS, # Number of epochs to train for
    "imgsz": IMAGE_SIZE, # Image size for training (640x640 pixels)
    "batch": BATCH_SIZE,  # Batch size
    "device": DEVICE,  # Use GPU if available, otherwise set to -1 for CPU,
    "patience": PATIENCE,  # Number of epochs with no improvement after whic
    "cache": "disk",  # Cache images for faster training
    "workers": NUM_OF_WORKERS,    # Number of data loading workers
}
```

Model Training

In [8]:
```
if __name__ == "__main__":
    # Initialize YOLOv8n model using the pre-trained weights
    model = YOLO("yolo_pretrained/yolov8n.pt")  # Load a pretrained YOLOv8 m

    # Start training with the pre-trained weights as the initialization
    results = model.train(
        **HYPERPARAMS,  # Unpack hyperparameters
    )

    # Export the trained weights to ONNX format once training completes:
    model.export(format='onnx')
```

New https://pypi.org/project/ultralytics/8.3.133 available Update with 'pip install -U ultralytics'
Ultralytics 8.3.131 Python-3.13.3 torch-2.7.0+cu128 CUDA:0 (NVIDIA GeForce RTX 5070 Ti, 16303MiB)
engine\trainer: agnostic_nms=False, amp=True, augment=False, auto_augment=randaugment, batch=16, bgr=0.0, box=7.5, cache=disk, 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, data=datasets/Vehicle-License-Plate-Detection\data.yaml, degrees=0.0, deterministic=True, device=0, dfl=1.5, dnn=False, dropout=0.0, dynamic=False, embed=None, epochs=500, 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=1280, int8=False, iou=0.7, keras=False, kobj=1.0, line_width=None, lr0=0.01, lrf=0.01, mask_ratio=4, max_det=300, mixup=0.0, mode=train, model=yolo_pretrained/yolov8n.pt, momentum=0.937, mosaic=1.0, multi_scale=False, name=imgsz1280, nbs=64, nms=False, opset=None, optimize=False, optimizer=auto, overlap_mask=True, patience=50, perspective=0.0, plots=True, pose=12.0, pretrained=True, profile=False, project=vehicle-license-plate-detection, rect=False, resume=False, retina_masks=False, save=True, save_conf=False, save_crop=False, save_dir=vehicle-license-plate-detection\near-complete\imgsz1280, 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 layers, 3,011,238 parameters, 3,011,222 gradients, 8.2 GF
LOPs

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: 0.00.0 ms, read: 389.6389.2 MB/s, size: 29
7.7 KB)
train: Scanning C:\Users\herma\dev\IS\yolo\datasets\Vehicle-License-Plate-De
tection\train\labels.cache... 1279 images, 0 backgrounds, 0 corrupt: 100%|██
████████| 1279/1279 [00:00<?, ?it/s]
train: Caching images (22.0GB Disk): 100%|██████████| 1279/1279 [00:00<00:0
0, 94018.63it/s]
val: Fast image access  (ping: 0.00.0 ms, read: 671.7507.0 MB/s, size: 561.1
KB)
val: Scanning C:\Users\herma\dev\IS\yolo\datasets\Vehicle-License-Plate-Dete
ction\valid\labels.cache... 182 images, 0 backgrounds, 0 corrupt: 100%|█████
█████| 182/182 [00:00<?, ?it/s]
val: Caching images (3.2GB Disk): 100%|██████████| 182/182 [00:00<00:00, 474
28.60it/s]
Plotting labels to vehicle-license-plate-detection\near-complete\imgsz1280\l
abels.jpg...
optimizer: 'optimizer=auto' found, ignoring 'lr0=0.01' and 'momentum=0.937'
and determining best 'optimizer', 'lr0' and 'momentum' 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 1280 train, 1280 val
Using 8 dataloader workers
Logging results to vehicle-license-plate-detection\near-complete\imgsz1280
Starting training for 500 epochs...

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
      1/500      8.36G       1.16      2.213      1.438        157        128
0: 100%|██████████| 80/80 [00:15<00:00,  5.17it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:01<00:00,  3.68it/s]
                   all        182        715      0.742      0.361      0.64
1       0.39

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      2/500      8.34G      1.156      1.562      1.387        165        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.61it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:01<00:00,  5.30it/s]
                   all        182        715      0.646      0.681      0.69
8      0.399

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      3/500      8.23G      1.175      1.427      1.418        131        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.67it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:01<00:00,  5.93it/s]
                   all        182        715      0.647      0.605      0.64
3      0.365

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      4/500      8.21G      1.167      1.239      1.397        134        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.18it/s]
                   all        182        715      0.763      0.666      0.76
9      0.464

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      5/500      8.21G      1.123       1.11       1.38        151        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.58it/s]
                   all        182        715      0.787      0.742      0.79
8        0.5

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      6/500      8.29G       1.14       1.06      1.391        109        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.38it/s]
                   all        182        715      0.744      0.649      0.73
2      0.458

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      7/500      8.23G      1.111      0.981       1.37        128        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.62it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.45it/s]
```

```
                   all        182        715      0.852      0.721      0.81
4      0.486

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      8/500      8.26G      1.083     0.9306      1.337        103        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.23it/s]
                   all        182        715      0.808      0.772      0.82
5       0.52

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      9/500      8.19G      1.063     0.8899      1.321        106        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.66it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.24it/s]
                   all        182        715      0.829      0.723      0.81
8      0.538

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     10/500      8.32G      1.063     0.8695      1.315        143        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.37it/s]
                   all        182        715      0.852      0.752      0.84
8      0.544

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     11/500      8.25G       1.03     0.8416      1.302        108        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.56it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
                   all        182        715      0.886      0.768      0.84
9      0.544

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     12/500      8.37G      1.027     0.8291      1.296        156        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.66it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.34it/s]
                   all        182        715      0.889      0.769      0.86
1      0.565

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     13/500      8.25G     0.9919     0.7819      1.274        146        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.61it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.28it/s]
                   all        182        715      0.824      0.792      0.85
7       0.57

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
     14/500      8.33G      1.002     0.7942      1.277        156        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.60it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.23it/s]
                   all        182        715      0.862      0.739      0.83
4      0.547

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     15/500      8.39G     0.9987      0.778      1.279        102        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.62it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.82it/s]
                   all        182        715      0.861      0.818      0.87
9      0.591

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     16/500      8.13G     0.9817     0.7613      1.269        116        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.92it/s]
                   all        182        715      0.843       0.82      0.87
7      0.585

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     17/500      8.26G     0.9815     0.7579      1.268        139        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.73it/s]
                   all        182        715      0.856      0.792      0.87
2      0.596

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     18/500      8.24G      0.964      0.747      1.254        136        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.82it/s]
                   all        182        715       0.88      0.796      0.87
9      0.591

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     19/500      8.34G     0.9504     0.7218      1.241        124        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.75it/s]
                   all        182        715       0.85      0.807      0.86
9      0.581

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     20/500      8.29G     0.9739     0.7487      1.259        150        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.67it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.50it/s]
```

```
                   all        182        715      0.859      0.807      0.87
4      0.581

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     21/500      8.23G     0.9652     0.7449      1.254        106        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.78it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.49it/s]
                   all        182        715      0.906      0.805      0.89
7      0.599

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     22/500      8.29G     0.9361     0.7084      1.235        129        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.46it/s]
                   all        182        715      0.872      0.798      0.86
9      0.591

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     23/500      8.13G     0.9351     0.7053      1.228        105        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.72it/s]
                   all        182        715      0.894      0.816      0.88
7      0.593

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     24/500      8.13G     0.9171     0.6753      1.209        112        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.76it/s]
                   all        182        715      0.865      0.832      0.89
5      0.617

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     25/500      8.23G     0.9219     0.6812      1.218        157        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.72it/s]
                   all        182        715      0.866      0.818      0.88
7      0.611

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     26/500      8.22G     0.9168     0.6803      1.211        128        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.35it/s]
                   all        182        715      0.852      0.818      0.87
8        0.6

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
     27/500      8.34G     0.9275     0.6872      1.222        101        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.68it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.84it/s]
                   all        182        715      0.872      0.815      0.88
8      0.597

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     28/500      8.24G     0.8998     0.6482      1.196        115        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.55it/s]
                   all        182        715      0.897      0.805      0.89
8      0.622

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     29/500      8.37G     0.8913     0.6453       1.19        118        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.66it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.32it/s]
                   all        182        715      0.895      0.802      0.88
4      0.602

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     30/500      8.13G     0.8931     0.6415      1.196        147        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.63it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.21it/s]
                   all        182        715       0.89      0.829      0.89
3      0.614

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     31/500       8.2G     0.8894     0.6445        1.2        120        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.67it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.86it/s]
                   all        182        715      0.878      0.836      0.90
5      0.634

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     32/500      8.13G     0.8771     0.6272      1.183        100        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.47it/s]
                   all        182        715      0.897       0.81      0.89
3      0.611

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     33/500      8.31G     0.8872     0.6341      1.186         89        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.43it/s]
```

```
                   all        182        715      0.881      0.854      0.89
9      0.618

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     34/500      8.26G     0.8771     0.6388      1.192        139        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.78it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.66it/s]
                   all        182        715      0.891      0.835      0.90
2      0.631

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     35/500      8.13G     0.8675     0.6236      1.175        128        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.74it/s]
                   all        182        715      0.908      0.826        0.8
9      0.624

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     36/500      8.24G     0.8733     0.6296      1.175        107        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.65it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.68it/s]
                   all        182        715      0.867      0.811      0.87
2      0.602

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     37/500      8.44G     0.8607     0.6174      1.167        139        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.75it/s]
                   all        182        715      0.892      0.808      0.89
6      0.624

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     38/500      8.26G     0.8511     0.6079      1.158         97        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.00it/s]
                   all        182        715      0.873      0.861      0.91
2      0.635

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     39/500      8.28G     0.8489     0.5923      1.154        119        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.61it/s]
                   all        182        715      0.867      0.865      0.91
4      0.643

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
     40/500      8.13G     0.8452     0.6043      1.166        127        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.30it/s]
                   all        182        715       0.89      0.825      0.89
7      0.638

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     41/500      8.31G     0.8364     0.5842      1.156        132        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.90it/s]
                   all        182        715      0.925      0.828      0.90
8      0.638

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     42/500      8.26G     0.8504     0.5981      1.165        129        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
                   all        182        715      0.876      0.831      0.89
4      0.637

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     43/500      8.24G     0.8367     0.5982      1.153        123        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.50it/s]
                   all        182        715      0.909      0.837      0.90
8      0.635

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     44/500      8.13G     0.8463     0.6014      1.157        129        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.78it/s]
                   all        182        715      0.894      0.841      0.90
2       0.63

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     45/500      8.36G     0.8376     0.5971      1.156        141        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.82it/s]
                   all        182        715      0.911      0.838      0.89
9      0.628

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     46/500      8.19G     0.8261     0.5689      1.141        117        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.72it/s]
```

```
                   all        182        715      0.895      0.861        0.9
2      0.654

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     47/500      8.21G     0.8169     0.5755      1.141        124        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.74it/s]
                   all        182        715      0.884      0.853      0.91
9      0.649

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     48/500      8.22G      0.822     0.5757      1.142        148        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.69it/s]
                   all        182        715       0.92      0.818      0.89
9      0.638

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     49/500      8.23G     0.8186     0.5684      1.146         91        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.78it/s]
                   all        182        715       0.91      0.842      0.91
2      0.638

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     50/500      8.22G     0.8171     0.5645      1.147        114        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.78it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.45it/s]
                   all        182        715      0.909      0.841      0.90
8      0.635

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     51/500      8.26G     0.8137     0.5644      1.132        168        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.69it/s]
                   all        182        715      0.908      0.841      0.91
3      0.651

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     52/500      8.24G     0.8045     0.5577      1.126        138        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.46it/s]
                   all        182        715      0.926      0.832      0.90
9      0.645

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
```

```
     53/500      8.25G     0.8156     0.5636       1.13        121        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.97it/s]
                   all        182        715      0.856      0.846      0.88
6      0.612

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     54/500      8.28G     0.8048     0.5525      1.127        113        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.73it/s]
                   all        182        715      0.905      0.837      0.90
7      0.645

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     55/500      8.26G     0.7924     0.5357      1.114        119        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.62it/s]
                   all        182        715       0.93      0.834      0.90
9      0.644

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     56/500      8.23G     0.7882     0.5387      1.109        104        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.79it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.59it/s]
                   all        182        715       0.92      0.857      0.91
7       0.65

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     57/500      8.13G       0.78     0.5346      1.115        109        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.59it/s]
                   all        182        715      0.894       0.86      0.91
3      0.638

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     58/500      8.22G     0.8029      0.546      1.123        141        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.63it/s]
                   all        182        715      0.932      0.838      0.91
7      0.648

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     59/500      8.25G     0.7937     0.5422      1.123        128        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.64it/s]
```

```
                   all        182        715      0.891      0.851        0.9
1      0.645

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     60/500      8.24G     0.7888     0.5325      1.123        142        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.78it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.68it/s]
                   all        182        715      0.919      0.843      0.91
7      0.646

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     61/500      8.29G     0.7782     0.5363      1.104        101        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.36it/s]
                   all        182        715      0.892      0.867      0.91
9      0.653

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     62/500      8.34G      0.769     0.5269        1.1        138        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.58it/s]
                   all        182        715      0.903      0.865      0.91
9      0.653

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     63/500      8.25G     0.7728     0.5229      1.093        112        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.79it/s]
                   all        182        715      0.901      0.857      0.91
3      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     64/500      8.25G     0.7608     0.5247      1.107        119        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.90it/s]
                   all        182        715      0.901      0.835      0.91
1      0.672

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     65/500      8.13G     0.7847     0.5328      1.098        128        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.71it/s]
                   all        182        715      0.913      0.839      0.91
3       0.66

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
```

```
     66/500      8.24G     0.7734     0.5214      1.102        142        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.56it/s]
                   all        182        715      0.919       0.86       0.92
6      0.668

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     67/500      8.79G     0.7629     0.5115      1.084        104        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
                   all        182        715      0.929      0.846       0.92
1      0.656

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     68/500      8.32G     0.7588     0.5102      1.101        114        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.84it/s]
                   all        182        715      0.917       0.85       0.92
5      0.653

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     69/500      8.37G      0.764     0.5202        1.1         83        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.98it/s]
                   all        182        715      0.883      0.866       0.92
2      0.652

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     70/500      8.21G      0.771     0.5234      1.102         84        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.81it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.82it/s]
                   all        182        715       0.91      0.865        0.9
2       0.66

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     71/500      8.22G     0.7504     0.5044      1.087        112        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.84it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.76it/s]
                   all        182        715      0.908      0.858       0.91
6      0.665

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     72/500      8.26G     0.7551     0.5091      1.091        162        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.79it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.83it/s]
```

```
                   all        182        715      0.911      0.876      0.92
6      0.672

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     73/500      8.26G     0.7545     0.5095      1.086        133        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.82it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  7.01it/s]
                   all        182        715      0.915      0.834      0.91
1      0.658

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     74/500      8.29G     0.7438     0.5038      1.086        102        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.65it/s]
                   all        182        715      0.911      0.862      0.91
4       0.66

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     75/500      8.21G     0.7509     0.5053      1.093        110        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.82it/s]
                   all        182        715      0.909      0.852      0.91
1      0.661

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     76/500      8.13G      0.743     0.5018      1.083        159        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.73it/s]
                   all        182        715      0.901      0.861      0.91
5      0.668

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     77/500      8.26G     0.7382     0.5048      1.086        112        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:01<00:00,  5.97it/s]
                   all        182        715      0.929      0.851      0.92
5      0.669

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     78/500      8.23G     0.7376     0.4997      1.085        117        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.91it/s]
                   all        182        715      0.905      0.847      0.92
2      0.666

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
     79/500      8.37G     0.7491     0.4959      1.085         98        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.88it/s]
                   all        182        715      0.908      0.851      0.91
4      0.659

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     80/500      8.24G     0.7355      0.492      1.078        151        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.78it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.74it/s]
                   all        182        715      0.946      0.835      0.91
8      0.661

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     81/500      8.23G     0.7499     0.4983      1.082        136        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.68it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.78it/s]
                   all        182        715      0.931      0.851      0.92
7      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     82/500      8.21G     0.7306     0.4809      1.069        137        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.80it/s]
                   all        182        715      0.913      0.873      0.91
8      0.672

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     83/500      8.26G     0.7284      0.488      1.069        173        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.60it/s]
                   all        182        715      0.905      0.863        0.9
2      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     84/500      8.25G      0.739     0.4946      1.077        147        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.34it/s]
                   all        182        715       0.91      0.865      0.92
3      0.669

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     85/500      8.25G     0.7262     0.4861      1.073        139        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.52it/s]
```

```
                   all        182        715      0.925      0.851      0.92
2      0.666

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

     86/500      8.28G     0.7203     0.4787      1.064        125        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.66it/s]
                   all        182        715      0.922      0.854      0.92
6      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

     87/500      8.32G     0.7318     0.4846      1.073        146        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.75it/s]
                   all        182        715      0.919      0.861        0.9
3      0.673

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

     88/500      8.21G     0.7121     0.4749      1.061        136        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.68it/s]
                   all        182        715      0.927      0.871      0.92
3      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

     89/500      8.39G     0.7202     0.4883      1.063        156        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.66it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.25it/s]
                   all        182        715      0.909      0.873      0.92
3      0.672

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

     90/500      8.29G       0.72     0.4723      1.063        123        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.96it/s]
                   all        182        715      0.932      0.837      0.91
7      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

     91/500      8.13G     0.7265     0.4831      1.067        134        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.58it/s]
                   all        182        715      0.922       0.87        0.9
2       0.67

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
     92/500      8.29G     0.7097     0.4691      1.064        113        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.02it/s]
                   all        182        715      0.911      0.869       0.92
1      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     93/500      8.23G     0.7137     0.4773      1.063        126        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.28it/s]
                   all        182        715      0.936      0.848       0.92
1      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     94/500      8.28G     0.7181     0.4762      1.056        102        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.76it/s]
                   all        182        715      0.923       0.84       0.92
1      0.667

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     95/500      8.28G     0.7127     0.4718      1.057        150        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.78it/s]
                   all        182        715      0.918      0.868       0.92
4      0.669

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     96/500      8.26G     0.7148     0.4723      1.059        107        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.60it/s]
                   all        182        715      0.941      0.847       0.92
2      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     97/500      8.39G     0.7087     0.4662      1.054        154        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.61it/s]
                   all        182        715      0.913      0.849       0.92
2      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     98/500      8.21G     0.7083     0.4645      1.062        113        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.42it/s]
```

```
                   all        182        715      0.922      0.858      0.92
8      0.669

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

     99/500      8.13G     0.7086     0.4683      1.057        128        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.46it/s]
                   all        182        715      0.882      0.873        0.9
2      0.659

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    100/500      8.22G      0.702     0.4563      1.049        173        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  7.00it/s]
                   all        182        715      0.914      0.863      0.92
3      0.668

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    101/500      8.28G     0.7039     0.4593      1.052        154        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.84it/s]
                   all        182        715      0.922      0.863      0.92
1      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    102/500      8.44G     0.7049     0.4616      1.048         87        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.72it/s]
                   all        182        715      0.907       0.87      0.92
3      0.683

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    103/500      8.24G     0.6845     0.4571      1.047        151        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.71it/s]
                   all        182        715      0.919      0.851      0.92
1      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    104/500      8.25G     0.6873      0.458      1.051        170        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.34it/s]
                   all        182        715      0.924      0.867      0.92
5      0.669

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    105/500      8.29G     0.7018     0.4606      1.053        110        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.37it/s]
                   all        182        715      0.928      0.856      0.91
6      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    106/500      8.29G     0.6937     0.4533       1.05        125        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.90it/s]
                   all        182        715      0.905      0.876      0.92
5      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    107/500      8.23G     0.6951     0.4537      1.049        142        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.25it/s]
                   all        182        715      0.899      0.873      0.92
3      0.679

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    108/500      8.22G      0.669     0.4444      1.037        166        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.82it/s]
                   all        182        715      0.903      0.843      0.91
6      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    109/500      8.22G     0.6807     0.4498      1.038        125        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.46it/s]
                   all        182        715      0.922      0.863      0.92
3      0.673

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    110/500      8.24G     0.6859     0.4521      1.042        168        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.77it/s]
                   all        182        715      0.934      0.858      0.92
3      0.672

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    111/500      8.36G     0.6696     0.4393       1.03        127        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.72it/s]
```

```
                   all        182        715      0.912      0.851        0.9
2      0.682

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    112/500      8.23G     0.6789     0.4487      1.043        158        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.87it/s]
                   all        182        715      0.927      0.866       0.92
6      0.677

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    113/500      8.21G      0.675     0.4435       1.04        106        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
                   all        182        715      0.937      0.855       0.92
9       0.67

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    114/500      8.36G     0.6795     0.4445      1.038        102        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
                   all        182        715      0.906      0.848        0.9
2      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    115/500      8.25G     0.6707     0.4383      1.038        153        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.94it/s]
                   all        182        715      0.879      0.869       0.91
8      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    116/500      8.29G     0.6744     0.4464      1.035        131        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.64it/s]
                   all        182        715      0.923       0.85       0.91
9      0.677

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    117/500      8.42G     0.6686     0.4376      1.024        132        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.89it/s]
                   all        182        715      0.903      0.864       0.91
7      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
```

```
    118/500       8.4G     0.6774     0.4396      1.025        112        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.85it/s]
                   all        182        715      0.898      0.879      0.92
5      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    119/500      8.23G     0.6695     0.4461      1.039        100        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.38it/s]
                   all        182        715      0.934      0.858      0.92
3      0.687

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    120/500      8.29G     0.6742      0.441      1.032        133        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.88it/s]
                   all        182        715      0.924      0.845      0.92
1      0.672

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    121/500       8.2G      0.664     0.4378      1.033        112        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.88it/s]
                   all        182        715      0.916       0.86      0.91
5      0.668

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    122/500      8.24G     0.6582     0.4293       1.02        116        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.73it/s]
                   all        182        715      0.923      0.861      0.91
9      0.676

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    123/500      8.29G     0.6613     0.4317      1.031        116        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.12it/s]
                   all        182        715      0.908      0.868      0.91
1      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    124/500      8.32G     0.6609     0.4306      1.024        108        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.62it/s]
```

```
                   all        182        715      0.906      0.875      0.92
6      0.675

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    125/500      7.93G     0.6569       0.43      1.022        180        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.68it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.81it/s]
                   all        182        715      0.906      0.873      0.92
2      0.685

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    126/500      8.13G     0.6673     0.4361       1.04        115        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.52it/s]
                   all        182        715      0.929      0.853      0.92
1      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    127/500      8.24G     0.6758     0.4366      1.026        148        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.54it/s]
                   all        182        715      0.943      0.841      0.92
3      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    128/500      8.24G     0.6576      0.432      1.027        224        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.88it/s]
                   all        182        715       0.93      0.873      0.92
6      0.688

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    129/500      8.31G     0.6581      0.426      1.024        151        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.59it/s]
                   all        182        715      0.925      0.872      0.92
5      0.684

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    130/500      8.22G     0.6594     0.4357      1.031         99        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.63it/s]
                   all        182        715      0.914      0.863      0.91
2      0.679

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
```

```
    131/500      8.29G     0.6494     0.4266      1.016        109        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.84it/s]
                   all        182        715      0.907      0.864      0.91
8      0.676

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    132/500      8.22G     0.6562     0.4304      1.016        115        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.68it/s]
                   all        182        715      0.913      0.868      0.91
5      0.678

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    133/500      8.22G     0.6471     0.4161      1.008        131        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.83it/s]
                   all        182        715      0.918      0.861      0.92
1       0.68

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    134/500      8.24G     0.6405     0.4155      1.006        105        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.95it/s]
                   all        182        715      0.924      0.867      0.92
2      0.677

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    135/500      8.44G     0.6561     0.4287      1.023        115        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.49it/s]
                   all        182        715      0.933      0.863      0.93
2      0.687

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    136/500      8.22G     0.6503     0.4196      1.014        152        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.63it/s]
                   all        182        715      0.929      0.855      0.92
3      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    137/500      8.28G     0.6476     0.4223      1.019        150        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.82it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.84it/s]
```

```
                   all        182        715      0.923      0.872      0.92
4      0.672

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    138/500      8.32G     0.6506      0.424      1.018        109        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.65it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.46it/s]
                   all        182        715      0.915      0.871      0.91
9      0.678

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    139/500      8.24G     0.6464      0.413      1.012         96        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.51it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.26it/s]
                   all        182        715      0.949      0.845      0.92
8      0.685

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    140/500      8.36G     0.6469     0.4162      1.017         96        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.51it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.75it/s]
                   all        182        715      0.935      0.852      0.92
3      0.686

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    141/500      8.13G     0.6342     0.4056       1.01        112        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.67it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.69it/s]
                   all        182        715      0.939      0.842      0.92
5      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    142/500      8.25G     0.6326      0.413      1.008        114        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.61it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.73it/s]
                   all        182        715      0.926      0.844      0.92
2      0.678

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e

    143/500      8.22G     0.6505     0.4229      1.016        139        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.62it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.83it/s]
                   all        182        715      0.932      0.861      0.92
4      0.686

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    144/500      8.25G     0.6332     0.4038      1.006         96        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.96it/s]
                   all        182        715      0.959       0.83       0.92
5      0.681

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    145/500      8.24G     0.6247     0.4082     0.9997        126        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.72it/s]
                   all        182        715      0.921      0.872       0.92
8      0.684

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    146/500      8.31G     0.6376     0.4158      1.007        150        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:01<00:00,  5.99it/s]
                   all        182        715      0.922      0.863       0.92
8      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    147/500      8.24G     0.6369     0.4114      1.009         86        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.58it/s]
                   all        182        715       0.92       0.85       0.91
8      0.685

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    148/500      8.13G       0.63      0.411      1.006         94        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.78it/s]
                   all        182        715      0.915       0.86       0.91
8       0.68

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    149/500      8.31G     0.6259     0.4036      1.006        111        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.15it/s]
                   all        182        715      0.931      0.855       0.91
8      0.685

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    150/500      8.13G      0.633     0.4071     0.9959        166        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.10it/s]
```

```
                   all        182        715      0.922       0.86       0.92
1      0.679

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    151/500      8.36G     0.6303     0.4065      1.004        129        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.60it/s]
                   all        182        715      0.938       0.86       0.92
6      0.686

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    152/500      8.28G     0.6154     0.3946     0.9946        109        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.33it/s]
                   all        182        715      0.936      0.837       0.91
7      0.675

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    153/500      8.21G     0.6232     0.4088      1.003        162        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.77it/s]
                   all        182        715      0.932      0.858       0.92
6      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    154/500      8.37G     0.6249     0.4038      0.994        133        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.85it/s]
                   all        182        715       0.93      0.852       0.92
2      0.679

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    155/500      8.22G     0.6226     0.4037      1.002        151        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.89it/s]
                   all        182        715      0.919      0.855       0.91
7      0.676

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    156/500      8.22G     0.6125     0.3969     0.9928        100        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.65it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.64it/s]
                   all        182        715      0.951       0.84       0.92
5      0.686

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    157/500      8.22G     0.6304     0.4018     0.9963        146        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.47it/s]
                   all        182        715      0.932      0.865      0.92
1      0.684

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    158/500      8.28G     0.6205     0.4048     0.9993        153        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.49it/s]
                   all        182        715      0.938      0.848      0.92
5       0.68

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    159/500      8.39G      0.615     0.3977      0.994        120        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.93it/s]
                   all        182        715      0.922      0.881      0.92
9      0.684

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    160/500      8.21G     0.6099     0.3993     0.9937         87        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.87it/s]
                   all        182        715      0.921      0.865      0.92
2      0.685

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    161/500      8.21G     0.6216     0.3997     0.9941        124        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.51it/s]
                   all        182        715      0.935      0.852      0.92
3       0.68

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    162/500      8.25G     0.6141     0.3932     0.9896        111        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.79it/s]
                   all        182        715      0.926      0.855      0.92
9      0.684

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    163/500      8.25G       0.62     0.3986     0.9947        110        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.60it/s]
```

```
                   all        182        715      0.914      0.867      0.92
8      0.679

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    164/500      8.24G     0.6108     0.3935     0.9921         98        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.64it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.49it/s]
                   all        182        715      0.915      0.875      0.92
4      0.688

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    165/500      8.28G     0.6074     0.3913     0.9881        131        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.65it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.47it/s]
                   all        182        715      0.917      0.877      0.92
6      0.684

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    166/500      8.29G     0.6145     0.3939     0.9886        185        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.58it/s]
                   all        182        715      0.919      0.871      0.92
7      0.683

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    167/500      8.39G     0.6107     0.3937     0.9853        142        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
                   all        182        715      0.915      0.867      0.92
3       0.68

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    168/500      8.26G     0.5976     0.3828     0.9807         96        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.80it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.78it/s]
                   all        182        715      0.904      0.872      0.92
3       0.69

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    169/500      8.13G      0.613     0.3941     0.9949        125        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.56it/s]
                   all        182        715      0.929      0.853      0.92
5      0.685

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    170/500      8.31G     0.6101     0.3946     0.9881         89        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.63it/s]
                   all        182        715      0.913      0.865      0.92
6      0.686

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    171/500      8.21G     0.6073      0.394      0.988        113        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.61it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.96it/s]
                   all        182        715      0.915       0.86        0.9
3      0.687

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    172/500      8.24G     0.6036      0.394     0.9863        130        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.63it/s]
                   all        182        715      0.897      0.873      0.92
3      0.683

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    173/500      8.42G     0.5989      0.388      0.982        153        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.79it/s]
                   all        182        715      0.926      0.855      0.92
1      0.691

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    174/500      8.21G     0.5998     0.3869     0.9907         92        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.64it/s]
                   all        182        715      0.927      0.847      0.91
8      0.687

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    175/500      8.31G     0.5966     0.3891     0.9876        113        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.58it/s]
                   all        182        715      0.927       0.85      0.92
3      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    176/500      8.26G     0.6047     0.3827     0.9815        113        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.71it/s]
```

```
                   all        182        715      0.924      0.855      0.91
9      0.692

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    177/500      8.25G     0.5837     0.3789     0.9819        121        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.63it/s]
                   all        182        715      0.927       0.86      0.92
4      0.694

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    178/500      8.28G     0.5951     0.3801     0.9813        125        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.67it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.77it/s]
                   all        182        715      0.938      0.854      0.92
1      0.681

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    179/500      8.26G     0.6006     0.3886     0.9931        130        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.73it/s]
                   all        182        715      0.931      0.854        0.9
2      0.685

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    180/500      8.39G     0.5955       0.38     0.9869        179        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.72it/s]
                   all        182        715      0.923      0.865      0.92
1      0.694

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    181/500      8.24G     0.5883     0.3753     0.9792        146        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.90it/s]
                   all        182        715      0.943      0.857      0.92
7      0.694

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    182/500      8.26G      0.589     0.3835     0.9811         82        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
                   all        182        715      0.928      0.862      0.92
3      0.683

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    183/500      8.22G     0.5827     0.3774     0.9788        127        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.17it/s]
                   all        182        715      0.916      0.866      0.92
6      0.679

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    184/500      8.13G     0.5868     0.3733     0.9761        130        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.68it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.61it/s]
                   all        182        715      0.936      0.859      0.92
6      0.686

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    185/500      8.31G     0.5826     0.3734     0.9792        108        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.76it/s]
                   all        182        715      0.921      0.883      0.92
8      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    186/500      8.21G     0.5804     0.3759     0.9889        134        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.88it/s]
                   all        182        715      0.923      0.865      0.92
9      0.687

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    187/500      8.31G     0.5932      0.389     0.9761        129        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.81it/s]
                   all        182        715      0.919       0.88      0.93
1      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    188/500      8.22G     0.5855      0.381      0.975        109        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.64it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:01<00:00,  5.67it/s]
                   all        182        715      0.934      0.862      0.92
7      0.684

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    189/500      8.21G     0.5829     0.3798     0.9789         90        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.84it/s]
```

```
                   all        182        715      0.925      0.874      0.93
1       0.69
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    190/500      8.22G     0.5683     0.3729     0.9702        144        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.98it/s]
                   all        182        715      0.926      0.877      0.93
4      0.699
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    191/500      8.26G     0.5796     0.3767     0.9768        115        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.77it/s]
                   all        182        715       0.92      0.884      0.92
4      0.686
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    192/500      8.34G     0.5749     0.3695     0.9721         98        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.67it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.86it/s]
                   all        182        715      0.934      0.858      0.92
3      0.689
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    193/500      8.36G      0.582     0.3714     0.9711        158        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.68it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
                   all        182        715      0.935      0.862      0.92
7      0.691
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    194/500      8.25G     0.5745     0.3682     0.9688         92        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.54it/s]
                   all        182        715      0.929      0.878        0.9
3       0.69
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    195/500      8.37G     0.5846     0.3756     0.9742        121        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.94it/s]
                   all        182        715      0.929       0.86      0.92
4       0.69
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    196/500      8.39G     0.5723      0.369     0.9686        113        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.47it/s]
                   all        182        715      0.936      0.864       0.93
1      0.696

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    197/500      8.28G     0.5844      0.373     0.9757        107        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.83it/s]
                   all        182        715      0.922      0.882       0.9
3      0.692

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    198/500      8.21G     0.5894     0.3747     0.9755        150        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.02it/s]
                   all        182        715      0.918       0.88       0.93
1      0.691

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    199/500      8.29G     0.5771     0.3712     0.9754        119        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.65it/s]
                   all        182        715      0.924      0.868       0.92
9       0.69

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    200/500      7.86G     0.5715     0.3681     0.9673        144        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.78it/s]
                   all        182        715      0.927      0.874       0.93
6      0.698

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    201/500      8.33G      0.573       0.37       0.97         85        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.82it/s]
                   all        182        715       0.92       0.88       0.92
8      0.694

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    202/500      8.22G     0.5714     0.3721     0.9697        157        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.81it/s]
```

```
                   all        182        715      0.941      0.864      0.92
1      0.692

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    203/500      8.29G      0.578     0.3711      0.971        122        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.36it/s]
                   all        182        715      0.928      0.868      0.92
6      0.692

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    204/500      8.21G     0.5689     0.3652     0.9661        143        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.65it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.49it/s]
                   all        182        715      0.935      0.871      0.92
8      0.697

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    205/500      8.22G     0.5722     0.3684     0.9709        159        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.66it/s]
                   all        182        715      0.922      0.874        0.9
3      0.697

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    206/500      8.21G     0.5699     0.3651     0.9769        113        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.82it/s]
                   all        182        715      0.932      0.859      0.92
6      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    207/500      8.22G     0.5733     0.3704     0.9728        123        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.73it/s]
                   all        182        715      0.939      0.855      0.92
5      0.694

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    208/500      8.25G     0.5611     0.3596     0.9592        111        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.37it/s]
                   all        182        715      0.931      0.868      0.92
7      0.693

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    209/500      8.22G     0.5735     0.3692     0.9603        151        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.62it/s]
                   all        182        715      0.938      0.864      0.92
6      0.692

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    210/500      8.39G     0.5586     0.3618     0.9638        125        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.36it/s]
                   all        182        715      0.927      0.859      0.92
4      0.697

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    211/500      8.39G      0.565     0.3663     0.9637        125        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.52it/s]
                   all        182        715      0.941      0.856      0.93
1      0.696

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    212/500      8.28G     0.5671       0.37     0.9627        130        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.59it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.64it/s]
                   all        182        715      0.939      0.862      0.92
7      0.694

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    213/500      8.31G     0.5562     0.3606     0.9718        134        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.11it/s]
                   all        182        715      0.937      0.863      0.92
5      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    214/500      8.28G     0.5578     0.3576     0.9604        133        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.64it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.55it/s]
                   all        182        715      0.934      0.872      0.92
9      0.698

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    215/500      8.19G     0.5581     0.3586     0.9585        145        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.72it/s]
```

```
                   all        182        715       0.93       0.86       0.92
7      0.688

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    216/500      8.21G     0.5622     0.3666     0.9644        118        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.63it/s]
                   all        182        715      0.913      0.867       0.92
5      0.693

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    217/500      8.23G     0.5573     0.3559     0.9582        109        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.86it/s]
                   all        182        715       0.92      0.869       0.92
6      0.693

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    218/500      8.26G     0.5533     0.3594     0.9555        154        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.96it/s]
                   all        182        715      0.928      0.851       0.92
6      0.693

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    219/500      8.31G     0.5516     0.3571     0.9654        129        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.82it/s]
                   all        182        715      0.928      0.857       0.92
8      0.692

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    220/500      8.34G     0.5688     0.3656     0.9673        148        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.63it/s]
                   all        182        715      0.927      0.871       0.92
9      0.691

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    221/500      8.13G     0.5585     0.3596     0.9609        174        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.73it/s]
                   all        182        715      0.918       0.87       0.92
6      0.699

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
```

```
    222/500      8.31G     0.5521     0.3525     0.9555        103        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.68it/s]
                   all        182        715      0.936       0.86       0.92
6      0.696

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    223/500      8.29G     0.5576     0.3583     0.9681        119        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.87it/s]
                   all        182        715       0.93       0.86       0.92
4      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    224/500       8.4G     0.5472       0.35       0.95        144        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.80it/s]
                   all        182        715      0.892      0.887       0.92
5      0.692

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    225/500      8.22G     0.5439     0.3515     0.9582        130        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.14it/s]
                   all        182        715      0.923      0.877        0.9
3      0.698

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    226/500      8.28G     0.5446     0.3508     0.9556        148        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.65it/s]
                   all        182        715      0.929      0.867       0.92
4      0.688

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    227/500      8.22G     0.5633     0.3611     0.9641         93        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.80it/s]
                   all        182        715      0.945      0.858       0.92
7      0.688

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    228/500      8.24G     0.5489     0.3532      0.956         94        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
```

```
                   all        182        715      0.936      0.858      0.92
5       0.69

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    229/500      8.36G     0.5451     0.3505      0.951        164        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.68it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.71it/s]
                   all        182        715       0.94      0.868      0.92
9      0.693

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    230/500      8.21G     0.5419     0.3478     0.9518        126        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.88it/s]
                   all        182        715      0.946      0.855      0.92
3      0.692

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    231/500      8.28G     0.5582     0.3575     0.9576        108        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.67it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:01<00:00,  5.89it/s]
                   all        182        715      0.937      0.868      0.92
4      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    232/500      8.26G     0.5363     0.3486     0.9534        132        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.70it/s]
                   all        182        715      0.944      0.857      0.92
5      0.685

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    233/500      8.32G      0.551     0.3546     0.9542        125        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:01<00:00,  5.96it/s]
                   all        182        715      0.915       0.88      0.92
8      0.685

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    234/500      8.23G     0.5476     0.3529     0.9552        123        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.57it/s]
                   all        182        715      0.932      0.869      0.92
5      0.689

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    235/500      8.25G     0.5507     0.3549     0.9549        124        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.77it/s]
                   all        182        715      0.921      0.863      0.92
6      0.695

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    236/500      8.21G     0.5481      0.352     0.9542        136        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.71it/s]
                   all        182        715      0.933      0.865      0.92
5      0.691

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    237/500      8.25G     0.5361     0.3421     0.9541        159        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.68it/s]
                   all        182        715      0.927      0.877      0.92
7      0.692

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    238/500       8.2G     0.5447     0.3474     0.9534        156        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.79it/s]
                   all        182        715      0.947      0.861      0.92
5      0.693

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    239/500      8.21G     0.5422     0.3472     0.9585        170        128
0: 100%|██████████| 80/80 [00:13<00:00,  5.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.83it/s]
                   all        182        715      0.941      0.868        0.9
3      0.694

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    240/500      8.31G     0.5507     0.3552     0.9613        138        128
0: 100%|██████████| 80/80 [00:14<00:00,  5.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.78it/s]
                   all        182        715      0.938      0.878      0.92
8      0.693
EarlyStopping: Training stopped early as no improvement observed in last 50
epochs. Best results observed at epoch 190, best model saved as best.pt.
To update EarlyStopping(patience=50) pass a new patience value, i.e. `patien
ce=300` or use `patience=0` to disable EarlyStopping.
```

```
240 epochs completed in 1.023 hours.
Optimizer stripped from vehicle-license-plate-detection\near-complete\imgsz1
280\weights\last.pt, 6.4MB
Optimizer stripped from vehicle-license-plate-detection\near-complete\imgsz1
280\weights\best.pt, 6.4MB

Validating vehicle-license-plate-detection\near-complete\imgsz1280\weights\b
est.pt...
Ultralytics 8.3.131  Python-3.13.3 torch-2.7.0+cu128 CUDA:0 (NVIDIA GeForce
RTX 5070 Ti, 16303MiB)
Model summary (fused): 72 layers, 3,006,038 parameters, 0 gradients, 8.1 GFL
OPs
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:01<00:00,  3.96it/s]
                   all        182        715      0.926      0.877      0.93
5      0.699
               carplate        181        259      0.962      0.882      0.93
2      0.627
                vehicle        182        456       0.89      0.873      0.93
7       0.77
Speed: 0.2ms preprocess, 2.4ms inference, 0.0ms loss, 2.2ms postprocess per
image
Results saved to vehicle-license-plate-detection\near-complete\imgsz1280
Ultralytics 8.3.131  Python-3.13.3 torch-2.7.0+cu128 CPU (AMD Ryzen 7 9700X
8-Core Processor)
Model summary (fused): 72 layers, 3,006,038 parameters, 0 gradients, 8.1 GFL
OPs

PyTorch: starting from 'vehicle-license-plate-detection\near-complete\imgsz1
280\weights\best.pt' with input shape (1, 3, 1280, 1280) BCHW and output sha
pe(s) (1, 6, 33600) (6.1 MB)

ONNX: starting export with onnx 1.18.0 opset 19...
ONNX: slimming with onnxslim 0.1.52...
ONNX: export success  0.7s, saved as 'vehicle-license-plate-detection\near-c
omplete\imgsz1280\weights\best.onnx' (12.2 MB)

Export complete (0.9s)
Results saved to C:\Users\herma\dev\IS\yolo\vehicle-license-plate-detection
\near-complete\imgsz1280\weights
Predict:         yolo predict task=detect model=vehicle-license-plate-detect
ion\near-complete\imgsz1280\weights\best.onnx imgsz=1280
Validate:        yolo val task=detect model=vehicle-license-plate-detection
\near-complete\imgsz1280\weights\best.onnx imgsz=1280 data=datasets/Vehicle-
License-Plate-Detection\data.yaml
Visualize:       https://netron.app
```

Save Model Architecture & Hyperparamaters used

In [17]:
```python
os.makedirs(ARCHITECTURE_DIR, exist_ok=True)

# 1️⃣ Save hyperparameters as JSON
hyp_path = os.path.join(ARCHITECTURE_DIR, "hyperparameters.json")
```

```
with open(hyp_path, "w") as f:
    json.dump(HYPERPARAMS, f, indent=2)
print(f"→ Hyperparameters written to {hyp_path}")

# 2️⃣ Save the model architecture (as text)
arch_path = os.path.join(ARCHITECTURE_DIR, "model_architecture.txt")
with open(arch_path, "w") as f:
    f.write(str(model.model))
print(f"→ Model architecture written to {arch_path}")

# 3️⃣ (Optional) Copy the best weights over
best_weights = os.path.join(ARCHITECTURE_DIR, "weights", "best.onnx")
if os.path.isfile(best_weights):
    os.replace(best_weights, os.path.join(ARCHITECTURE_DIR, "best_{EXPERIMEN
    print("→ Copied best.onnx with custom name")
```

```
→ Hyperparameters written to vehicle-license-plate-detection\near-complete\i
mgsz1280\architecture\hyperparameters.json
→ Model architecture written to vehicle-license-plate-detection\near-complet
e\imgsz1280\architecture\model_architecture.txt
```

Testing Dataset Evaluation

In [22]:

```
if __name__ == "__main__":
    # 1️⃣ Load the model once, with task pre-declared
    model = YOLO(TRAINED_MODEL_WEIGHTS, task="detect")

    # 2️⃣ Evaluate at several confidence thresholds
    for conf in (0.25, 0.50, 0.75):
        model.val(
            data=DATA_YAML,
            split="test",
            project=EVALUATION_DIR,      # root evaluation folder
            name=f"{conf:.2f}",          # e.g. "0.25", "0.50", "0.75"
            exist_ok=True,
            workers=NUM_OF_WORKERS,
            conf=conf,                   # ← varying threshold
            device=DEVICE,
            save_json=True,
            half=False,
            imgsz=IMAGE_SIZE,
        )
        print(f"Finished evaluation at conf={conf:.2f}")
```

```
Ultralytics 8.3.131  Python-3.13.3 torch-2.7.0+cu128 CUDA:0 (NVIDIA GeForce
RTX 5070 Ti, 16303MiB)
Loading vehicle-license-plate-detection\near-complete\imgsz1280\weights\bes
t.onnx for ONNX Runtime inference...
Using ONNX Runtime CUDAExecutionProvider
Setting batch=1 input of shape (1, 3, 1280, 1280)
val: Fast image access  (ping: 0.00.0 ms, read: 643.7660.5 MB/s, size: 669.0
KB)
```

```
val: Scanning C:\Users\herma\dev\IS\yolo\datasets\Vehicle-License-Plate-Dete
ction\test\labels.cache... 253 images, 0 backgrounds, 0 corrupt: 100%|██████
████| 253/253 [00:00<?, ?it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 253/253 [00:02<00:00, 88.04it/s]
                   all        253       1494       0.88      0.792       0.8
7      0.671
               carplate        251        512      0.942      0.797      0.88
2       0.62
                vehicle        253        982      0.818      0.786      0.85
8      0.722
Speed: 0.4ms preprocess, 6.7ms inference, 0.0ms loss, 1.1ms postprocess per
image
Saving vehicle-license-plate-detection\near-complete\imgsz1280\evaluation\0.
25\predictions.json...
Results saved to vehicle-license-plate-detection\near-complete\imgsz1280\eva
luation\0.25
Finished evaluation at conf=0.25
Ultralytics 8.3.131  Python-3.13.3 torch-2.7.0+cu128 CUDA:0 (NVIDIA GeForce
RTX 5070 Ti, 16303MiB)
Loading vehicle-license-plate-detection\near-complete\imgsz1280\weights\bes
t.onnx for ONNX Runtime inference...
Using ONNX Runtime CUDAExecutionProvider
Setting batch=1 input of shape (1, 3, 1280, 1280)
val: Fast image access  (ping: 0.00.0 ms, read: 3017.91455.4 MB/s, size: 88
5.7 KB)
val: Scanning C:\Users\herma\dev\IS\yolo\datasets\Vehicle-License-Plate-Dete
ction\test\labels.cache... 253 images, 0 backgrounds, 0 corrupt: 100%|██████
████| 253/253 [00:00<?, ?it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 253/253 [00:02<00:00, 89.36it/s]
                   all        253       1494       0.94       0.74      0.85
4      0.671
               carplate        251        512      0.972      0.746      0.86
1      0.616
                vehicle        253        982      0.908      0.734      0.84
6      0.727
Speed: 0.4ms preprocess, 6.7ms inference, 0.0ms loss, 1.1ms postprocess per
image
Saving vehicle-license-plate-detection\near-complete\imgsz1280\evaluation\0.
50\predictions.json...
Results saved to vehicle-license-plate-detection\near-complete\imgsz1280\eva
luation\0.50
Finished evaluation at conf=0.50
Ultralytics 8.3.131  Python-3.13.3 torch-2.7.0+cu128 CUDA:0 (NVIDIA GeForce
RTX 5070 Ti, 16303MiB)
Loading vehicle-license-plate-detection\near-complete\imgsz1280\weights\bes
t.onnx for ONNX Runtime inference...
Using ONNX Runtime CUDAExecutionProvider
Setting batch=1 input of shape (1, 3, 1280, 1280)
val: Fast image access  (ping: 0.00.0 ms, read: 2797.41519.1 MB/s, size: 32
0.3 KB)
```

```
val: Scanning C:\Users\herma\dev\IS\yolo\datasets\Vehicle-License-Plate-Detection\test\labels.cache... 253 images, 0 backgrounds, 0 corrupt: 100%|██████████| 253/253 [00:00<?, ?it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 253/253 [00:02<00:00, 91.15it/s]
                   all        253       1494       0.98      0.636      0.809      0.656
               carplate        251        512      0.988      0.623      0.803       0.59
                vehicle        253        982      0.973      0.649      0.815      0.722
Speed: 0.4ms preprocess, 6.7ms inference, 0.0ms loss, 1.1ms postprocess per image
Saving vehicle-license-plate-detection\near-complete\imgsz1280\evaluation\0.75\predictions.json...
Results saved to vehicle-license-plate-detection\near-complete\imgsz1280\evaluation\0.75
Finished evaluation at conf=0.75
```