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 [ ]:
```
# 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 = "imgsz640-500"

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 [24]:
```
NUMBER_OF_EPOCHS = 500
IMAGE_SIZE = 640
BATCH_SIZE = 16
PATIENCE = 50
NUM_OF_WORKERS = 8
```

In [25]:
```
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 [26]:
```
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=ra
ndaugment, batch=16, bgr=0.0, box=7.5, cache=disk, cfg=None, classes=None, c
lose_mosaic=10, cls=0.5, conf=None, copy_paste=0.0, copy_paste_mode=flip, co
s_lr=False, cutmix=0.0, data=datasets/Vehicle-License-Plate-Detection\data.y
aml, 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, fli
plr=0.5, flipud=0.0, format=torchscript, fraction=1.0, freeze=None, half=Fal
se, hsv_h=0.015, hsv_s=0.7, hsv_v=0.4, imgsz=640, int8=False, iou=0.7, keras
=False, kobj=1.0, line_width=None, lr0=0.01, lrf=0.01, mask_ratio=4, max_det
=300, mixup=0.0, mode=train, model=yolo_pretrained/yolov8n.pt, momentum=0.93
7, mosaic=1.0, multi_scale=False, name=imgsz640-2, nbs=64, nms=False, opset=
None, optimize=False, optimizer=auto, overlap_mask=True, patience=50, perspe
ctive=0.0, plots=True, pose=12.0, pretrained=True, profile=False, project=ve
hicle-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\imgsz640-2, save_frames=False, save_json=False, save
_period=-1, save_txt=False, scale=0.5, seed=0, shear=0.0, show=False, show_b
oxes=True, show_conf=True, show_labels=True, simplify=True, single_cls=Fals
e, source=None, split=val, stream_buffer=False, task=detect, time=None, trac
ker=botsort.yaml, translate=0.1, val=True, verbose=True, vid_stride=1, visua
lize=False, warmup_bias_lr=0.1, warmup_epochs=3.0, warmup_momentum=0.8, weig
ht_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: 437.6380.2 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, 84196.80it/s]
val: Fast image access  (ping: 0.10.0 ms, read: 153.0149.8 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, 120
309.43it/s]
Plotting labels to vehicle-license-plate-detection\near-complete\imgsz640-2
\labels.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 640 train, 640 val
Using 8 dataloader workers
Logging results to vehicle-license-plate-detection\near-complete\imgsz640-2
Starting training for 500 epochs...

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
      1/500      2.06G      1.023      1.634      1.184        156         64
0: 100%|██████████| 80/80 [00:06<00:00, 11.59it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.23it/s]
                   all        182        715      0.811      0.331      0.63
6      0.408

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      2/500      2.07G      1.073      1.126      1.196        164         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.59it/s]
                   all        182        715      0.713      0.626      0.67
9      0.416

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      3/500      2.09G      1.099      1.087      1.223        130         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.91it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.71it/s]
                   all        182        715      0.702      0.615      0.65
3      0.392

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      4/500      2.09G      1.112      1.025      1.217        133         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.36it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.76it/s]
                   all        182        715      0.726      0.656      0.70
9      0.431

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      5/500      2.09G      1.062     0.9474      1.194        151         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.22it/s]
                   all        182        715      0.815      0.738      0.78
9      0.503

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      6/500      2.11G      1.057     0.9162      1.197        110         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.44it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.67it/s]
                   all        182        715      0.711      0.658      0.67
8       0.42

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
      7/500      2.11G       1.03     0.8599       1.18        127         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.35it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.10it/s]
```

```
                   all        182        715      0.833      0.721      0.78
3      0.492

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

      8/500      2.11G      1.023     0.8389      1.177        103         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.09it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.23it/s]
                   all        182        715      0.848      0.716      0.78
5      0.503

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

      9/500      2.12G      1.007     0.8178      1.165        104         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.62it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.43it/s]
                   all        182        715      0.884      0.729      0.79
9      0.512

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     10/500      2.12G     0.9987     0.7956      1.149        139         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.19it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.74it/s]
                   all        182        715      0.885      0.733      0.81
3      0.523

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     11/500      2.12G     0.9943     0.7877      1.152        108         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.18it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.71it/s]
                   all        182        715      0.854      0.777        0.8
2      0.528

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     12/500      2.14G     0.9829     0.7629      1.146        153         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.43it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.09it/s]
                   all        182        715      0.858      0.741      0.80
5      0.513

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e

     13/500      2.14G      0.949     0.7272      1.125        146         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.57it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.49it/s]
                   all        182        715      0.829      0.757      0.79
6      0.545
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     14/500      2.14G       0.95     0.7334      1.128        156         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.22it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.83it/s]
                   all        182        715      0.872      0.756      0.81
3      0.537

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     15/500      2.14G     0.9557      0.724      1.134        102         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.83it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.94it/s]
                   all        182        715      0.898      0.729      0.81
2      0.561

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     16/500      2.14G     0.9439      0.721      1.133        113         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.41it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.51it/s]
                   all        182        715      0.892      0.757      0.83
6      0.572

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     17/500      2.14G      0.924     0.6985      1.115        139         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.10it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.63it/s]
                   all        182        715      0.901      0.758      0.82
4      0.557

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     18/500      2.14G     0.9372     0.7055      1.124        136         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.64it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.94it/s]
                   all        182        715      0.904      0.737      0.82
1      0.558

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     19/500      2.14G     0.9036     0.6797      1.098        123         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.55it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.20it/s]
                   all        182        715      0.891      0.774       0.8
3       0.57

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
```

```
     20/500      2.14G     0.9069     0.6685      1.102        149         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.10it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.77it/s]
                   all        182        715      0.912      0.763      0.83
9      0.578

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     21/500      2.14G      0.909     0.6815      1.111        106         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.42it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.93it/s]
                   all        182        715      0.917      0.758      0.83
2       0.57

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     22/500      2.14G     0.9035     0.6634      1.103        129         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.90it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.38it/s]
                   all        182        715      0.929       0.73      0.83
1      0.586

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     23/500      2.14G     0.9002     0.6669      1.104        105         64
0: 100%|██████████| 80/80 [00:06<00:00, 13.31it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.29it/s]
                   all        182        715      0.901      0.773        0.8
5        0.6

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     24/500      2.14G     0.8889     0.6565      1.089        112         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.70it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.96it/s]
                   all        182        715      0.915      0.771      0.84
4      0.583

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     25/500      2.14G     0.8894     0.6524      1.093        157         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.81it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.29it/s]
                   all        182        715       0.89      0.773      0.84
2      0.593

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     26/500      2.14G     0.8759     0.6379      1.088        125         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.22it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.07it/s]
```

```
                   all        182        715      0.889      0.809      0.85
5      0.598

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     27/500      2.14G     0.8826     0.6387      1.098        101         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.09it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.54it/s]
                   all        182        715      0.911      0.768      0.84
8      0.588

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     28/500      2.14G     0.8763     0.6283      1.081        115         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.18it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.35it/s]
                   all        182        715      0.867      0.766        0.8
4      0.587

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     29/500      2.14G     0.8627     0.6187       1.07        118         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.00it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.56it/s]
                   all        182        715      0.893       0.76      0.83
5      0.573

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     30/500      2.16G     0.8593     0.6232      1.078        145         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.08it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.87it/s]
                   all        182        715      0.909      0.768      0.84
3      0.588

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     31/500      2.16G     0.8706      0.625      1.079        120         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.13it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.93it/s]
                   all        182        715      0.914      0.776      0.85
5      0.602

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     32/500      2.16G     0.8552     0.6119      1.072        100         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.86it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.77it/s]
                   all        182        715      0.905      0.783      0.84
7      0.589
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    33/500      2.17G     0.8501     0.5998      1.067         89         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.37it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.68it/s]
                   all        182        715      0.924      0.769      0.85
9      0.614
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    34/500      2.17G     0.8515     0.6123      1.077        139         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.93it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  7.75it/s]
                   all        182        715      0.885      0.771      0.84
7      0.591
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    35/500      2.19G     0.8404     0.5959      1.062        127         64
0: 100%|██████████| 80/80 [00:06<00:00, 12.96it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.13it/s]
                   all        182        715       0.93      0.758      0.84
5      0.606
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    36/500      2.19G     0.8455     0.5956      1.066        107         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.02it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.37it/s]
                   all        182        715      0.897      0.802      0.86
8      0.611
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    37/500      2.19G     0.8382     0.5878      1.058        139         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.32it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.14it/s]
                   all        182        715      0.906      0.806      0.86
6      0.605

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    38/500      2.19G     0.8145     0.5804      1.046         96         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.22it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.64it/s]
                   all        182        715      0.898      0.798      0.85
2        0.6
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
```

```
     39/500      2.19G     0.8331     0.5811      1.055        119         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.12it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.18it/s]
                   all        182        715      0.894      0.806      0.86
3      0.611

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     40/500      2.19G     0.8227     0.5827      1.056        123         64
0: 100%|██████████| 80/80 [00:06<00:00, 12.35it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.85it/s]
                   all        182        715       0.92      0.783      0.85
2      0.607

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     41/500      2.19G     0.8234     0.5664      1.048        131         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.30it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.13it/s]
                   all        182        715       0.93      0.779      0.86
1       0.61

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     42/500      2.19G     0.8174     0.5664      1.048        129         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.84it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.82it/s]
                   all        182        715      0.911      0.757      0.84
5      0.602

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     43/500      2.19G     0.8191     0.5835      1.052        123         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.59it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.23it/s]
                   all        182        715      0.915      0.788      0.86
2      0.608

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     44/500      2.19G     0.8144     0.5726      1.053        128         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.02it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.03it/s]
                   all        182        715      0.931      0.772      0.85
3      0.615

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     45/500      2.19G     0.8059     0.5719      1.044        140         64
0: 100%|██████████| 80/80 [00:06<00:00, 13.31it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.08it/s]
```

```
                   all        182        715      0.892      0.793        0.8
6       0.61
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     46/500      2.19G     0.8104     0.5574      1.043        117         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.25it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.06it/s]
                   all        182        715      0.925      0.792      0.86
4      0.621
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     47/500      2.19G     0.7903     0.5539      1.041        124         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.79it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.84it/s]
                   all        182        715      0.903      0.793      0.85
9      0.612
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     48/500      2.19G     0.7961     0.5615      1.045        147         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.29it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.58it/s]
                   all        182        715      0.905      0.789      0.85
7      0.612
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     49/500      2.19G     0.8059     0.5643       1.04         91         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.12it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.79it/s]
                   all        182        715      0.928      0.798      0.86
3      0.622
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     50/500      2.19G     0.7889     0.5467      1.039        112         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.48it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.29it/s]
                   all        182        715      0.894      0.809      0.86
3      0.615
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     51/500      2.19G     0.7925     0.5571      1.041        166         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.93it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.99it/s]
                   all        182        715      0.916      0.793      0.86
3      0.614
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
```

```
     52/500      2.19G     0.7903     0.5479      1.036        138         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.21it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.66it/s]
                   all        182        715      0.925      0.786      0.86
2      0.614

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     53/500      2.19G     0.7965     0.5444      1.036        121         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.07it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.10it/s]
                   all        182        715      0.921      0.794       0.8
7       0.63

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     54/500      2.19G     0.7942     0.5447      1.039        111         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.63it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.59it/s]
                   all        182        715      0.905      0.803      0.86
9      0.616

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     55/500      2.19G     0.8016     0.5446      1.034        119         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.11it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.48it/s]
                   all        182        715      0.904      0.788      0.86
4      0.622

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     56/500      2.19G     0.7876     0.5348      1.027        104         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.14it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.97it/s]
                   all        182        715      0.915      0.791      0.86
7      0.625

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     57/500      2.19G     0.7702      0.527       1.03        109         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.92it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  7.99it/s]
                   all        182        715      0.936      0.799      0.86
7      0.628

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
     58/500      2.19G     0.7899     0.5383      1.029        141        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.94it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.72it/s]
                   all        182        715      0.937      0.778        0.8
7      0.622

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     59/500      2.19G     0.7809     0.5401       1.03        127        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.89it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.85it/s]
                   all        182        715      0.916      0.799      0.86
4      0.613

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     60/500      2.19G     0.7655     0.5266      1.026        141        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.13it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.04it/s]
                   all        182        715       0.91      0.802        0.8
6       0.63

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     61/500      2.19G     0.7626     0.5226      1.019        101        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.06it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.81it/s]
                   all        182        715      0.901      0.787      0.85
6      0.625

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     62/500      2.19G     0.7618     0.5192      1.018        137        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.94it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  7.97it/s]
                   all        182        715       0.94      0.773        0.8
6      0.631

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     63/500      2.19G     0.7577     0.5134      1.012        112        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.47it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.81it/s]
                   all        182        715      0.917        0.8      0.86
8      0.629

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
     64/500      2.19G     0.7482     0.5116      1.014        119         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.03it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.89it/s]
                   all        182        715       0.92      0.801      0.87
8      0.628

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     65/500      2.19G     0.7721     0.5214      1.016        128         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.99it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.92it/s]
                   all        182        715      0.913      0.802      0.87
3       0.64

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     66/500      2.19G     0.7611      0.516      1.017        142         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.63it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.30it/s]
                   all        182        715      0.911      0.804      0.86
7      0.622

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     67/500      2.35G      0.761     0.5152      1.012        104         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.89it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  7.86it/s]
                   all        182        715      0.896      0.799      0.86
7       0.64

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     68/500      2.35G     0.7464     0.5078      1.015        113         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.93it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.66it/s]
                   all        182        715      0.914      0.818      0.86
9      0.632

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     69/500      2.35G     0.7488     0.5172      1.016         83         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.89it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.21it/s]
                   all        182        715      0.923      0.809      0.86
8      0.632

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     70/500      2.35G     0.7455     0.5055      1.009         82         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.86it/s]
```

```
                   all        182        715      0.914      0.791      0.87
2      0.641

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     71/500      2.35G     0.7407     0.5039      1.004        111         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.12it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.97it/s]
                   all        182        715      0.891      0.815      0.86
7      0.628

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     72/500      2.35G     0.7411     0.5011      1.008        159         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.02it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.82it/s]
                   all        182        715      0.906      0.808      0.86
9      0.638

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     73/500      2.35G     0.7445     0.5076      1.007        132         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.79it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.54it/s]
                   all        182        715      0.898      0.803      0.86
5      0.633

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     74/500      2.35G     0.7398     0.4978      1.006        101         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.68it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.28it/s]
                   all        182        715       0.92      0.789      0.86
8      0.641

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     75/500      2.35G     0.7396      0.498      1.012        109         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.37it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.95it/s]
                   all        182        715       0.93      0.796        0.8
7      0.626

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     76/500      2.35G     0.7436     0.4974      1.007        157         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.04it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.80it/s]
                   all        182        715      0.912      0.807      0.87
1      0.631
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     77/500      2.37G      0.731     0.4891      1.006        112         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.22it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.64it/s]
                   all        182        715      0.868      0.814      0.85
9      0.635
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     78/500      2.37G     0.7396     0.4991      1.004        116         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.17it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.29it/s]
                   all        182        715       0.92      0.807      0.86
6      0.636
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     79/500      2.37G     0.7415     0.5003      1.006         99         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.52it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.54it/s]
                   all        182        715      0.904      0.818        0.8
7      0.637
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     80/500      2.37G     0.7308     0.4899     0.9997        150         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.98it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.64it/s]
                   all        182        715      0.895      0.803      0.86
5      0.638
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     81/500      2.37G     0.7332     0.4834     0.9973        134         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.23it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.15it/s]
                   all        182        715      0.914      0.809      0.86
4       0.63
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
     82/500      2.37G      0.735     0.4851     0.9999        134         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.18it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.82it/s]
                   all        182        715      0.911      0.811      0.87
1      0.638
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
```

```
     83/500      2.37G     0.7181     0.4839     0.9944        169         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.49it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.16it/s]
                   all        182        715      0.936        0.8      0.87
5      0.633

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     84/500      2.37G     0.7331     0.4914      1.006        147         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.03it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.13it/s]
                   all        182        715        0.9      0.809      0.87
4       0.63

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     85/500      2.37G     0.7213     0.4904     0.9977        137         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.16it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.00it/s]
                   all        182        715       0.93      0.796      0.86
3      0.628

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     86/500      2.37G     0.7207     0.4779      0.997        123         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.37it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.76it/s]
                   all        182        715      0.923      0.811        0.8
8      0.641

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     87/500      2.37G     0.7287     0.4802     0.9972        146         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.20it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.10it/s]
                   all        182        715      0.923      0.807      0.87
6      0.636

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     88/500      2.37G     0.7194     0.4711     0.9945        136         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.34it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.11it/s]
                   all        182        715      0.936      0.806        0.8
8      0.636

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
     89/500      2.37G     0.7085     0.4756      0.988        155        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.03it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  7.66it/s]
                   all        182        715      0.892      0.811      0.86
9      0.637

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     90/500      2.37G     0.7083     0.4697     0.9905        123        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.04it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.29it/s]
                   all        182        715      0.921      0.783      0.86
4      0.627

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     91/500      2.37G      0.721     0.4874     0.9982        134        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.97it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.09it/s]
                   all        182        715      0.931      0.787      0.86
9      0.642

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     92/500      2.37G     0.7003     0.4659     0.9884        112        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.16it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.07it/s]
                   all        182        715      0.933      0.792      0.86
5      0.647

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     93/500      2.37G     0.7119     0.4748     0.9936        126        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.93it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.99it/s]
                   all        182        715      0.923      0.791      0.87
1      0.648

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     94/500      2.37G     0.7158     0.4802     0.9927        102        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.54it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.75it/s]
                   all        182        715      0.929      0.809      0.86
9      0.637

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
     95/500      2.37G     0.7179     0.4776     0.9925        149        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.37it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.72it/s]
                   all        182        715      0.914      0.807      0.87
3      0.636

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     96/500      2.37G     0.7108     0.4707     0.9909        105        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.92it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.05it/s]
                   all        182        715      0.922      0.811      0.86
6      0.636

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     97/500      2.37G      0.716       0.47       0.99        151        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.66it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.78it/s]
                   all        182        715      0.927      0.797      0.86
7       0.63

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     98/500      2.37G      0.706     0.4631     0.9878        113        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.94it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.04it/s]
                   all        182        715      0.916      0.805      0.87
8      0.648

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
     99/500      2.37G     0.7044     0.4642     0.9886        128        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.86it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.23it/s]
                   all        182        715      0.922        0.8      0.87
6       0.65

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    100/500      2.37G     0.7099     0.4686     0.9901        173        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.18it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.65it/s]
                   all        182        715      0.912      0.808      0.87
1      0.639

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    101/500      2.37G     0.7025     0.4621     0.9857        154        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.92it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.77it/s]
```

```
                   all        182        715      0.923      0.789      0.86
8       0.63
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    102/500      2.37G      0.712     0.4665     0.9879         87         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.56it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.11it/s]
                   all        182        715      0.934      0.792      0.87
2      0.645
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    103/500      2.37G     0.6924     0.4579     0.9834        147         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.30it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.51it/s]
                   all        182        715      0.928      0.804      0.87
3      0.642

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    104/500      2.37G     0.6963     0.4582     0.9869        167         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.08it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.90it/s]
                   all        182        715      0.928      0.799      0.87
8       0.65
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    105/500      2.37G     0.6984     0.4588     0.9838        111         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.36it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.19it/s]
                   all        182        715      0.924      0.809      0.88
2      0.646
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    106/500      2.37G     0.7001     0.4565      0.986        125         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.98it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.26it/s]
                   all        182        715      0.908       0.81      0.87
5       0.64
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    107/500      2.37G     0.6935     0.4577     0.9829        135         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.12it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.19it/s]
                   all        182        715      0.914      0.821       0.8
8      0.653
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    108/500      2.37G     0.6821     0.4437     0.9793        163        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.18it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.38it/s]
                   all        182        715      0.933      0.801      0.87
9      0.635

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    109/500      2.37G     0.6881     0.4537     0.9815        124        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.39it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.20it/s]
                   all        182        715      0.926      0.812        0.8
8      0.655

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    110/500      2.37G     0.6844      0.452     0.9791        167        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.99it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.79it/s]
                   all        182        715      0.925      0.803      0.87
6      0.639

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    111/500      2.37G     0.6857     0.4535     0.9726        127        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.16it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.06it/s]
                   all        182        715      0.943      0.802      0.87
6      0.645

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    112/500      2.37G     0.6866     0.4549     0.9781        158        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.01it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.93it/s]
                   all        182        715       0.92      0.815      0.88
1      0.638

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    113/500      2.37G     0.6811      0.451     0.9782        106        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.94it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.21it/s]
                   all        182        715      0.947      0.801      0.88
3      0.643

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    114/500      2.37G     0.6793     0.4503     0.9784        102         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.25it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.56it/s]
                   all        182        715      0.943      0.795      0.87
9      0.651

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    115/500      2.37G     0.6842     0.4484      0.977        153         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.30it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.59it/s]
                   all        182        715      0.915      0.818      0.88
4      0.656

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    116/500      2.37G     0.6759     0.4493      0.974        127         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.81it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.23it/s]
                   all        182        715      0.896      0.838      0.87
9      0.656

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    117/500      2.37G     0.6665     0.4407     0.9674        132         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.93it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.07it/s]
                   all        182        715      0.926      0.804      0.87
9      0.637

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    118/500      2.37G     0.6714     0.4388     0.9681        113         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.19it/s]
                   all        182        715      0.949      0.808      0.87
4      0.646

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    119/500      2.37G      0.675     0.4465     0.9786        100         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.00it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.97it/s]
                   all        182        715       0.93      0.803      0.87
9      0.654

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    120/500      2.37G     0.6654     0.4388     0.9682        131         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.39it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.99it/s]
                   all        182        715      0.939      0.792      0.86
8      0.647

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    121/500      2.37G     0.6601      0.434     0.9687        112         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.04it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.37it/s]
                   all        182        715      0.941      0.815      0.87
4       0.65

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    122/500      2.37G     0.6645     0.4319     0.9687        116         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.68it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.56it/s]
                   all        182        715      0.928      0.806      0.87
7      0.646

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    123/500      2.37G     0.6644      0.432     0.9667        116         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.04it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.78it/s]
                   all        182        715      0.928      0.809      0.88
3      0.644

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    124/500      2.37G     0.6635      0.438     0.9662        106         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.14it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.33it/s]
                   all        182        715      0.937      0.799      0.87
6      0.648

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    125/500      2.37G     0.6715     0.4362     0.9708        180         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.35it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.47it/s]
                   all        182        715      0.926      0.805      0.87
7      0.653

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    126/500      2.37G     0.6639     0.4379     0.9756        114         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.23it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.65it/s]
                   all        182        715      0.927      0.808      0.87
3      0.647

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    127/500      2.37G     0.6822     0.4423     0.9704        147         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.01it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.96it/s]
                   all        182        715      0.948      0.795      0.88
4      0.644

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    128/500      2.37G     0.6598     0.4345     0.9698        221         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.95it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.02it/s]
                   all        182        715      0.941      0.805      0.88
8       0.65

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    129/500      2.37G     0.6743     0.4438     0.9727        149         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.90it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.25it/s]
                   all        182        715      0.923      0.803      0.87
8      0.648

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    130/500      2.37G     0.6645     0.4419      0.969         99         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.04it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.97it/s]
                   all        182        715      0.925      0.802      0.87
8      0.654

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    131/500      2.37G     0.6608     0.4353     0.9693        109         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.82it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.83it/s]
                   all        182        715      0.911      0.818      0.87
9      0.648

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    132/500      2.37G     0.6622     0.4383     0.9666        114         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.97it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.81it/s]
```

```
                   all        182        715      0.927      0.812      0.87
8      0.643

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    133/500      2.37G     0.6547     0.4299     0.9606        131         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.74it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.97it/s]
                   all        182        715      0.949      0.794        0.8
8      0.657

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    134/500      2.37G     0.6471     0.4225     0.9601        104         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.57it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.40it/s]
                   all        182        715      0.923      0.799       0.88
2      0.641

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    135/500      2.37G     0.6586     0.4309     0.9652        114         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.47it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.18it/s]
                   all        182        715      0.926       0.81       0.87
9      0.641

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    136/500      2.37G     0.6644     0.4304      0.966        152         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.38it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.77it/s]
                   all        182        715      0.929      0.801      0.87
8      0.648

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    137/500      2.37G     0.6568     0.4278     0.9657        149         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.92it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.27it/s]
                   all        182        715      0.935      0.806      0.87
7       0.64

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    138/500      2.37G     0.6522     0.4282     0.9659        109         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.87it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.76it/s]
                   all        182        715      0.931      0.809      0.88
1      0.646

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    139/500      2.38G     0.6517     0.4219     0.9628         96         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.35it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.90it/s]
                   all        182        715      0.932      0.812      0.88
5      0.654

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    140/500      2.38G     0.6596     0.4287     0.9654         96         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.06it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.52it/s]
                   all        182        715      0.946      0.821      0.88
9      0.659

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    141/500      2.38G     0.6473     0.4181     0.9592        110         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.00it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.87it/s]
                   all        182        715      0.928      0.817      0.88
8      0.656

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    142/500      2.38G     0.6502     0.4231     0.9538        114         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.25it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.00it/s]
                   all        182        715      0.945      0.797      0.87
9      0.651

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    143/500      2.38G     0.6515     0.4273     0.9645        139         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.27it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.12it/s]
                   all        182        715       0.93      0.813      0.88
1      0.659

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    144/500      2.38G     0.6542     0.4238     0.9598         96         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.09it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.22it/s]
                   all        182        715      0.933      0.811      0.88
7      0.654

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    145/500      2.38G     0.6387     0.4208     0.9552        125         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.45it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.78it/s]
```

```
                   all        182        715       0.91      0.823      0.8
8      0.652

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    146/500      2.38G     0.6488     0.4241     0.9617        149         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.59it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.18it/s]
                   all        182        715      0.933      0.797      0.87
4      0.653

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    147/500      2.38G     0.6525     0.4271     0.9588         86         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.13it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.65it/s]
                   all        182        715      0.952      0.811      0.88
6      0.659

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    148/500      2.38G     0.6384     0.4188     0.9579         93         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.02it/s]
                   all        182        715       0.94      0.807      0.88
4      0.652

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    149/500      2.38G     0.6299     0.4089     0.9486        110         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.23it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  7.93it/s]
                   all        182        715      0.943      0.805      0.88
8      0.661

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    150/500      2.38G     0.6498     0.4176     0.9548        166         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.32it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.39it/s]
                   all        182        715       0.91      0.826      0.8
8      0.653

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    151/500      2.38G     0.6361     0.4166     0.9541        129         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.06it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.15it/s]
                   all        182        715      0.926      0.816      0.87
7      0.653

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    152/500      2.38G     0.6376     0.4118     0.9549        109         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.23it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.73it/s]
                   all        182        715      0.923      0.816      0.87
9      0.649

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    153/500      2.38G     0.6385     0.4115     0.9563        162         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.03it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.20it/s]
                   all        182        715      0.932      0.809      0.88
1       0.65

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    154/500      2.38G     0.6466     0.4151     0.9557        132         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.08it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.29it/s]
                   all        182        715       0.92      0.812      0.88
7      0.654

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    155/500      2.38G      0.635     0.4111     0.9514        150         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.97it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.22it/s]
                   all        182        715      0.924      0.814       0.8
8      0.655

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    156/500      2.38G     0.6229     0.4021     0.9472         99         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.36it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.50it/s]
                   all        182        715       0.94      0.796      0.87
8      0.646


      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    157/500      2.38G     0.6359     0.4097     0.9488        145         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.86it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.02it/s]
                   all        182        715       0.93      0.812      0.88
8      0.659

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    158/500      2.38G     0.6386     0.4109     0.9598        153         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.12it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.98it/s]
                   all        182        715      0.952      0.799      0.88
1      0.652

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    159/500      2.38G     0.6376     0.4153     0.9505        120         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.04it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.95it/s]
                   all        182        715      0.929      0.815      0.88
3       0.65

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    160/500      2.38G     0.6215     0.4099     0.9502         87         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.56it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.44it/s]
                   all        182        715       0.94      0.814      0.88
2      0.654

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    161/500      2.38G     0.6286     0.4114     0.9494        123         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.81it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.01it/s]
                   all        182        715       0.95       0.81      0.88
4       0.66

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    162/500      2.38G     0.6259      0.401     0.9507        111         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.66it/s]
                   all        182        715      0.921      0.814      0.88
6      0.663


      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    163/500      2.38G     0.6343     0.4115     0.9501        110         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.86it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.63it/s]
                   all        182        715       0.94      0.812      0.88
6      0.662


      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    164/500      2.38G     0.6237     0.4051     0.9459         98         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.82it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.81it/s]
                   all        182        715      0.934      0.814      0.88
6      0.665

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    165/500      2.38G     0.6307     0.4045     0.9462        131         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.51it/s]
                   all        182        715      0.938        0.8      0.87
7       0.66

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    166/500      2.38G      0.625     0.4071     0.9455        182         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.11it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.29it/s]
                   all        182        715      0.947      0.805      0.88
7      0.661

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    167/500      2.38G     0.6212     0.4031     0.9442        142         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.51it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.33it/s]
                   all        182        715      0.917      0.818      0.88
5      0.654

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    168/500      2.38G     0.6082     0.3914     0.9381         96         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.31it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.33it/s]
                   all        182        715      0.956      0.812      0.89
1      0.666

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    169/500      2.38G     0.6231      0.404     0.9517        125         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.77it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.33it/s]
                   all        182        715       0.95        0.8      0.88
1      0.661

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    170/500      2.38G     0.6272     0.4057     0.9443         87         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.17it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.04it/s]
```

```
                   all        182        715       0.94       0.81        0.8
8      0.657

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    171/500      2.38G      0.621     0.4047     0.9465        112         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.93it/s]
                   all        182        715      0.937      0.817       0.88
3      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    172/500      2.38G     0.6173     0.3963     0.9449        128         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.19it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.20it/s]
                   all        182        715      0.933      0.827       0.88
4      0.653

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    173/500      2.38G     0.6156     0.3936     0.9401        153         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.39it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.61it/s]
                   all        182        715       0.91      0.824       0.87
8      0.659

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    174/500      2.38G      0.619     0.4018     0.9469         93         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.18it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.96it/s]
                   all        182        715      0.923       0.82       0.88
7      0.658

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    175/500      2.38G     0.6181      0.396     0.9449        113         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.83it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.22it/s]
                   all        182        715      0.914      0.822       0.88
9      0.656

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    176/500      2.38G     0.6227      0.394     0.9439        113         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.67it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.76it/s]
                   all        182        715      0.915      0.828       0.88
9      0.661
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    177/500      2.38G     0.6067     0.3967     0.9396        121        640: 100%|██████████| 80/80 [00:05<00:00, 14.12it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.00it/s]
                   all        182        715      0.934       0.81      0.882      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    178/500      2.38G      0.613     0.3915     0.9401        122        640: 100%|██████████| 80/80 [00:05<00:00, 13.99it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.12it/s]
                   all        182        715      0.934      0.818      0.882      0.656

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    179/500      2.38G     0.6092     0.3949     0.9454        129        640: 100%|██████████| 80/80 [00:05<00:00, 14.61it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.54it/s]
                   all        182        715      0.934      0.812      0.885      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    180/500      2.38G     0.6116     0.3901     0.9445        178        640: 100%|██████████| 80/80 [00:05<00:00, 14.49it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.66it/s]
                   all        182        715      0.942      0.807      0.887       0.67

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    181/500      2.38G     0.6079     0.3927     0.9402        146        640: 100%|██████████| 80/80 [00:05<00:00, 13.97it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.03it/s]
                   all        182        715      0.907      0.823      0.888      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    182/500      2.38G     0.6088     0.3955     0.9436         82        640: 100%|██████████| 80/80 [00:05<00:00, 14.33it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.12it/s]
                   all        182        715       0.91      0.835      0.887       0.67

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
```

```
    183/500      2.38G     0.5998     0.3868      0.935        127         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.13it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.01it/s]
                   all        182        715      0.933      0.813      0.88
6       0.67

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    184/500      2.38G     0.6082     0.3927     0.9391        129         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.14it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.90it/s]
                   all        182        715      0.946      0.801      0.88
4      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    185/500      2.38G     0.6037      0.389     0.9428        108         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.09it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.21it/s]
                   all        182        715      0.919      0.827      0.88
4      0.661

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    186/500      2.38G     0.5968     0.3851     0.9397        133         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.75it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  7.85it/s]
                   all        182        715      0.925      0.811      0.88
1      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    187/500      2.38G     0.6119     0.3981     0.9412        129         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.93it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.18it/s]
                   all        182        715      0.935      0.805      0.88
6      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    188/500      2.38G     0.5976     0.3912     0.9389        109         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.93it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.02it/s]
                   all        182        715      0.942      0.797      0.88
7      0.666

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    189/500      2.38G     0.5958     0.3897     0.9392         89         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.00it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.22it/s]
```

```
                   all        182        715      0.936       0.81      0.88
3      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    190/500      2.38G     0.5904     0.3858     0.9338        142         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.97it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.10it/s]
                   all        182        715      0.938      0.818      0.88
9      0.665

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    191/500      2.38G     0.5985     0.3887     0.9367        114         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.13it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.84it/s]
                   all        182        715      0.944      0.797        0.8
8      0.666

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    192/500      2.38G       0.59     0.3831      0.933         99         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.42it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.06it/s]
                   all        182        715      0.928      0.814      0.88
8      0.662

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    193/500      2.38G     0.6027     0.3856     0.9331        158         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.56it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.74it/s]
                   all        182        715      0.956      0.802      0.88
9      0.659

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    194/500      2.38G     0.5935     0.3841      0.934         92         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.82it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.96it/s]
                   all        182        715      0.932      0.811        0.8
9      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
e
    195/500      2.38G     0.5974     0.3864     0.9359        121         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.09it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.76it/s]
                   all        182        715      0.954        0.8      0.88
8      0.668
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    196/500      2.38G      0.592     0.3774     0.9307        113         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.76it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.42it/s]
                   all        182        715      0.937      0.809      0.88
8      0.661

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    197/500      2.38G     0.6099     0.3867     0.9395        105         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.98it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.43it/s]
                   all        182        715      0.929      0.806      0.88
6      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    198/500      2.38G     0.6016     0.3858     0.9367        148         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.39it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.25it/s]
                   all        182        715       0.92      0.827      0.88
5      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    199/500      2.38G     0.5874     0.3795     0.9358        118         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.85it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.55it/s]
                   all        182        715      0.938      0.824      0.89
2      0.668

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    200/500      2.38G     0.5861     0.3737     0.9305        144         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.26it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.52it/s]
                   all        182        715       0.93      0.811      0.88
5      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    201/500      2.38G     0.5982     0.3841     0.9371         85         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.05it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.30it/s]
                   all        182        715      0.941      0.821      0.88
6      0.661

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
```

```
    202/500      2.38G     0.5913     0.3836     0.9321        155         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.04it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.98it/s]
                   all        182        715      0.923      0.829      0.88
6      0.665

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    203/500      2.38G     0.5903     0.3788     0.9352        122         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.23it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.24it/s]
                   all        182        715       0.94      0.814      0.89
2      0.667

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    204/500      2.38G     0.5888     0.3812     0.9347        143         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.16it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.83it/s]
                   all        182        715      0.934      0.809      0.88
9       0.67

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    205/500      2.38G     0.5831     0.3787     0.9297        157         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.30it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.62it/s]
                   all        182        715      0.935      0.821      0.89
2      0.676

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    206/500      2.38G     0.5851      0.376     0.9386        111         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.18it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.08it/s]
                   all        182        715      0.935      0.822      0.88
5      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    207/500      2.38G     0.5935      0.388     0.9367        121         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.80it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.57it/s]
                   all        182        715      0.936      0.821      0.88
4      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    208/500      2.38G     0.5879     0.3772     0.9271        110         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.39it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.87it/s]
```

```
                   all        182        715      0.939      0.816      0.88
4      0.665

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    209/500      2.38G     0.5954     0.3798     0.9333        150        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.02it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.60it/s]
                   all        182        715      0.949      0.806      0.88
8      0.669

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    210/500      2.38G     0.5798      0.377     0.9302        125        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.03it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.69it/s]
                   all        182        715      0.954      0.802      0.88
7      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    211/500      2.38G      0.582     0.3747     0.9299        125        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.22it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.79it/s]
                   all        182        715      0.965      0.802        0.8
9       0.66

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    212/500      2.38G     0.5815     0.3785     0.9291        128        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.33it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.32it/s]
                   all        182        715      0.949      0.806      0.88
4      0.666

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    213/500      2.38G     0.5713      0.371     0.9306        134        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.01it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.80it/s]
                   all        182        715      0.931      0.824      0.88
6      0.668

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    214/500      2.38G     0.5845     0.3772      0.926        131        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.41it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.82it/s]
                   all        182        715       0.94      0.812      0.88
7      0.663
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    215/500      2.38G     0.5816     0.3763     0.9303        144        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.28it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.17it/s]
                   all        182        715      0.951       0.81      0.88
8      0.664
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    216/500      2.38G     0.5826     0.3745     0.9317        117        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.63it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.35it/s]
                   all        182        715      0.953      0.804      0.88
8      0.665
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    217/500      2.38G     0.5798     0.3735     0.9246        108        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.82it/s]
                   all        182        715      0.948      0.802      0.88
6      0.667

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    218/500      2.38G     0.5752      0.374     0.9242        152        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.17it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.43it/s]
                   all        182        715      0.956      0.797      0.88
7      0.662
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    219/500      2.38G     0.5802     0.3677     0.9306        128        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.21it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.61it/s]
                   all        182        715      0.948      0.802      0.88
5      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    220/500      2.38G     0.5837     0.3755     0.9252        147        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.11it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.72it/s]
                   all        182        715      0.955      0.805      0.88
9      0.673
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    221/500      2.38G     0.5735     0.3716     0.9227        173         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.06it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.23it/s]
                   all        182        715      0.946      0.807      0.88
6      0.668

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    222/500      2.38G     0.5777     0.3722      0.925        103         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.72it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.63it/s]
                   all        182        715      0.931      0.815      0.88
4      0.659

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    223/500      2.38G     0.5711     0.3683     0.9298        119         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.11it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.00it/s]
                   all        182        715      0.934      0.803      0.88
6      0.665

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    224/500      2.38G     0.5668     0.3635     0.9216        143         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.14it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.76it/s]
                   all        182        715      0.933      0.808      0.88
4      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    225/500      2.38G     0.5691      0.365     0.9219        131         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.41it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.88it/s]
                   all        182        715      0.943      0.806      0.88
7      0.666

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    226/500      2.38G     0.5677     0.3656     0.9223        146         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.94it/s]
                   all        182        715      0.926      0.821      0.88
5       0.66

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    227/500      2.38G     0.5809     0.3736     0.9309         92         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.04it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.32it/s]
```

```
                   all        182        715      0.945      0.812      0.88
6      0.658

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    228/500      2.38G     0.5753     0.3702     0.9258         94         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.29it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.32it/s]
                   all        182        715      0.913      0.828      0.88
9      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    229/500      2.38G     0.5717     0.3654     0.9195        164         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.71it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.98it/s]
                   all        182        715      0.935      0.812      0.88
9      0.665

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    230/500      2.38G     0.5634     0.3568     0.9215        124         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.45it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.19it/s]
                   all        182        715       0.92      0.822        0.8
9      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    231/500      2.38G     0.5757      0.371      0.927        107         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.35it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.99it/s]
                   all        182        715       0.93      0.811      0.89
3      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    232/500      2.38G     0.5672     0.3656     0.9228        132         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.03it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.23it/s]
                   all        182        715      0.942      0.804      0.88
8       0.67

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    233/500      2.38G     0.5766     0.3688     0.9263        124         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.17it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.05it/s]
```

```
                   all        182        715      0.936       0.81      0.88
5      0.669

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    234/500      2.38G     0.5706     0.3664     0.9212        123         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.29it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.08it/s]
                   all        182        715      0.908      0.831      0.88
6      0.669

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    235/500      2.38G     0.5752     0.3724     0.9285        124         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.45it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.58it/s]
                   all        182        715      0.931      0.808      0.88
7       0.67

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    236/500      2.38G      0.576     0.3687     0.9249        133         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.10it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.95it/s]
                   all        182        715      0.954        0.8      0.88
5      0.674

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    237/500      2.38G     0.5598     0.3606     0.9228        159         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.94it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.89it/s]
                   all        182        715      0.938      0.808      0.88
7      0.671

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    238/500      2.38G     0.5659     0.3609     0.9211        155         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.65it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.49it/s]
                   all        182        715      0.939      0.806      0.88
6      0.665

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    239/500      2.38G     0.5624     0.3582     0.9271        168         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.23it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.08it/s]
                   all        182        715      0.908      0.834      0.88
5      0.671
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    240/500      2.38G     0.5682     0.3646     0.9242        137        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.69it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.23it/s]
                   all        182        715       0.94      0.811      0.88
9      0.668
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    241/500      2.38G     0.5569     0.3556     0.9205        143        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.14it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.70it/s]
                   all        182        715      0.936      0.811      0.88
4      0.665
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    242/500      2.38G     0.5661     0.3685     0.9258         73        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.97it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.82it/s]
                   all        182        715      0.943      0.798      0.88
5      0.663
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    243/500      2.38G     0.5599     0.3625     0.9214         79        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.28it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.65it/s]
                   all        182        715      0.928       0.81      0.88
4      0.664
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    244/500      2.38G     0.5566     0.3558     0.9168        119        64
0: 100%|██████████| 80/80 [00:05<00:00, 14.04it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.26it/s]
                   all        182        715       0.93      0.814      0.88
2      0.667
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    245/500      2.38G     0.5659      0.365      0.921        120        64
0: 100%|██████████| 80/80 [00:05<00:00, 13.93it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.19it/s]
                   all        182        715      0.932      0.806      0.88
3      0.669
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
```

```
    246/500      2.38G      0.553     0.3592     0.9176        126         64
0: 100%|██████████| 80/80 [00:05<00:00, 13.73it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.22it/s]
                   all        182        715      0.926      0.807      0.88
5      0.667

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    247/500      2.38G     0.5545     0.3608     0.9176        125         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.31it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.12it/s]
                   all        182        715       0.93       0.81      0.87
9      0.661

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    248/500      2.38G     0.5554     0.3569     0.9216        111         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.23it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.03it/s]
                   all        182        715      0.936      0.808      0.88
2      0.665

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    249/500      2.38G     0.5613     0.3601     0.9193        128         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.25it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.13it/s]
                   all        182        715      0.937      0.812      0.88
4      0.666

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    250/500      2.38G     0.5524     0.3584     0.9208         84         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.15it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.94it/s]
                   all        182        715       0.94      0.801      0.88
1      0.664

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    251/500      2.38G     0.5596     0.3599     0.9149        108         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.11it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.31it/s]
                   all        182        715      0.935        0.8      0.87
9      0.663

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Siz
e
    252/500      2.38G     0.5552     0.3574     0.9203        111         64
0: 100%|██████████| 80/80 [00:05<00:00, 14.46it/s]
                 Class     Images  Instances      Box(P          R      mAP5
0  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.59it/s]
```

```
                   all        182        715      0.935      0.811      0.883      0.662

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    253/500      2.38G     0.5561     0.3564     0.9196        118         640: 100%|██████████| 80/80 [00:05<00:00, 14.35it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  9.05it/s]
                   all        182        715      0.954      0.799      0.889      0.664
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    254/500      2.38G     0.5526     0.3586      0.918        102         640: 100%|██████████| 80/80 [00:05<00:00, 14.28it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.79it/s]
                   all        182        715      0.942      0.805      0.885      0.664
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances       Size
    255/500      2.38G     0.5547     0.3564     0.9204        134         640: 100%|██████████| 80/80 [00:05<00:00, 14.18it/s]
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  8.88it/s]
                   all        182        715      0.945      0.799      0.884      0.666
EarlyStopping: Training stopped early as no improvement observed in last 50 epochs. Best results observed at epoch 205, best model saved as best.pt.
To update EarlyStopping(patience=50) pass a new patience value, i.e. `patience=300` or use `patience=0` to disable EarlyStopping.

255 epochs completed in 0.470 hours.
Optimizer stripped from vehicle-license-plate-detection\near-complete\imgsz640-2\weights\last.pt, 6.3MB
Optimizer stripped from vehicle-license-plate-detection\near-complete\imgsz640-2\weights\best.pt, 6.3MB

Validating vehicle-license-plate-detection\near-complete\imgsz640-2\weights\best.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 GFLOPs
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95): 100%|██████████| 6/6 [00:00<00:00,  6.16it/s]
```

```
                   all        182        715       0.93      0.825      0.89
2      0.676
               carplate        181        259      0.964      0.815      0.87
7      0.573
                vehicle        182        456      0.895      0.836      0.90
7      0.779
Speed: 0.1ms preprocess, 0.5ms inference, 0.0ms loss, 0.9ms postprocess per
image
Results saved to vehicle-license-plate-detection\near-complete\imgsz640-2
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\imgsz6
40-2\weights\best.pt' with input shape (1, 3, 640, 640) BCHW and output shap
e(s) (1, 6, 8400) (6.0 MB)

ONNX: starting export with onnx 1.18.0 opset 19...
ONNX: slimming with onnxslim 0.1.52...
ONNX: export success  0.5s, saved as 'vehicle-license-plate-detection\near-c
omplete\imgsz640-2\weights\best.onnx' (11.7 MB)

Export complete (0.7s)
Results saved to C:\Users\herma\dev\IS\yolo\vehicle-license-plate-detection
\near-complete\imgsz640-2\weights
Predict:         yolo predict task=detect model=vehicle-license-plate-detect
ion\near-complete\imgsz640-2\weights\best.onnx imgsz=640
Validate:        yolo val task=detect model=vehicle-license-plate-detection
\near-complete\imgsz640-2\weights\best.onnx imgsz=640 data=datasets/Vehicle-
License-Plate-Detection\data.yaml
Visualize:       https://netron.app
```

Save Model Architecture & Hyperparamaters used

In [27]:

```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
mgsz640-2\architecture\hyperparameters.json
→ Model architecture written to vehicle-license-plate-detection\near-complet
e\imgsz640-2\architecture\model_architecture.txt
```

Testing Dataset Evaluation

In [28]:
```
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\imgsz640-2\weights\bes
t.onnx for ONNX Runtime inference...
Using ONNX Runtime CUDAExecutionProvider
Setting batch=1 input of shape (1, 3, 640, 640)
val: Fast image access  (ping: 0.00.0 ms, read: 788.8699.9 MB/s, size: 563.3
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, 114.67it/s]
```

```
                   all        253       1494      0.912      0.683       0.8
2      0.627
               carplate        251        512      0.965      0.645      0.81
1      0.558
                vehicle        253        982      0.859      0.721      0.82
8      0.696
Speed: 0.3ms preprocess, 4.2ms inference, 0.0ms loss, 1.0ms postprocess per
image
Saving vehicle-license-plate-detection\near-complete\imgsz640-2\evaluation
\0.25\predictions.json...
Results saved to vehicle-license-plate-detection\near-complete\imgsz640-2\ev
aluation\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\imgsz640-2\weights\bes
t.onnx for ONNX Runtime inference...
Using ONNX Runtime CUDAExecutionProvider
Setting batch=1 input of shape (1, 3, 640, 640)
val: Fast image access  (ping: 0.00.0 ms, read: 2390.61708.5 MB/s, size: 50
2.5 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, 114.12it/s]
                   all        253       1494      0.944      0.649      0.80
5      0.632
               carplate        251        512      0.975      0.607      0.78
6      0.557
                vehicle        253        982      0.914      0.691      0.82
3      0.706
Speed: 0.3ms preprocess, 4.4ms inference, 0.0ms loss, 1.1ms postprocess per
image
Saving vehicle-license-plate-detection\near-complete\imgsz640-2\evaluation
\0.50\predictions.json...
Results saved to vehicle-license-plate-detection\near-complete\imgsz640-2\ev
aluation\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\imgsz640-2\weights\bes
t.onnx for ONNX Runtime inference...
Using ONNX Runtime CUDAExecutionProvider
Setting batch=1 input of shape (1, 3, 640, 640)
val: Fast image access  (ping: 0.00.0 ms, read: 2194.71742.5 MB/s, size: 36
9.1 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, 125.33it/s]
```

```
                   all        253       1494      0.976      0.548       0.7
6      0.619
               carplate        251        512      0.973      0.492      0.72
9      0.534
                vehicle        253        982      0.979      0.603      0.79
2      0.705
Speed: 0.2ms preprocess, 3.9ms inference, 0.0ms loss, 1.0ms postprocess per
image
Saving vehicle-license-plate-detection\near-complete\imgsz640-2\evaluation
\0.75\predictions.json...
Results saved to vehicle-license-plate-detection\near-complete\imgsz640-2\ev
aluation\0.75
Finished evaluation at conf=0.75
```