drowsiness-detection

July 11, 2023

```
[70]: #install and import dependencies
      !pip install torch torchvision torchaudio --index-url https://download.pytorch.
       ↪org/whl/cu117
```

Looking in indexes: https://download.pytorch.org/whl/cu117
Requirement already satisfied: torch in c:\users\kiit\anaconda3\lib\site-
packages (2.0.1+cu117)
Requirement already satisfied: torchvision in c:\users\kiit\anaconda3\lib\site-
packages (0.15.2+cu117)
Requirement already satisfied: torchaudio in c:\users\kiit\anaconda3\lib\site-
packages (2.0.2+cu117)
Requirement already satisfied: filelock in c:\users\kiit\anaconda3\lib\site-
packages (from torch) (3.6.0)
Requirement already satisfied: jinja2 in c:\users\kiit\anaconda3\lib\site-
packages (from torch) (2.11.3)
Requirement already satisfied: typing-extensions in
c:\users\kiit\anaconda3\lib\site-packages (from torch) (4.3.0)
Requirement already satisfied: networkx in c:\users\kiit\anaconda3\lib\site-
packages (from torch) (2.8.4)
Requirement already satisfied: sympy in c:\users\kiit\anaconda3\lib\site-
packages (from torch) (1.10.1)
Requirement already satisfied: requests in c:\users\kiit\anaconda3\lib\site-
packages (from torchvision) (2.28.1)
Requirement already satisfied: pillow!=8.3.*,>=5.3.0 in
c:\users\kiit\anaconda3\lib\site-packages (from torchvision) (9.2.0)
Requirement already satisfied: numpy in c:\users\kiit\anaconda3\lib\site-
packages (from torchvision) (1.24.4)
Requirement already satisfied: MarkupSafe>=0.23 in
c:\users\kiit\anaconda3\lib\site-packages (from jinja2->torch) (2.0.1)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in
c:\users\kiit\anaconda3\lib\site-packages (from requests->torchvision) (1.26.11)
Requirement already satisfied: certifi>=2017.4.17 in
c:\users\kiit\anaconda3\lib\site-packages (from requests->torchvision)
(2022.12.7)
Requirement already satisfied: idna<4,>=2.5 in c:\users\kiit\anaconda3\lib\site-
packages (from requests->torchvision) (3.3)
Requirement already satisfied: charset-normalizer<3,>=2 in
c:\users\kiit\anaconda3\lib\site-packages (from requests->torchvision) (2.0.4)

Requirement already satisfied: mpmath>=0.19 in c:\users\kiit\anaconda3\lib\site-packages (from sympy->torch) (1.2.1)

[4]:

'git' is not recognized as an internal or external command,
operable program or batch file.

```python
[1]: import torch
     from matplotlib import pyplot as plt
     import numpy as np
     import cv2
```

```python
[3]: #load Model
     model = torch.hub.load('ultralytics/yolov5','yolov5s')
```

Downloading: "https://github.com/ultralytics/yolov5/zipball/master" to
C:\Users\KIIT/.cache\torch\hub\master.zip
YOLOv5 2023-7-8 Python-3.9.13 torch-2.0.1+cu117 CUDA:0 (GeForce MX330, 2048MiB)

Downloading
https://github.com/ultralytics/yolov5/releases/download/v7.0/yolov5s.pt to
yolov5s.pt…
100%|
  | 14.1M/14.1M [00:01<00:00, 14.3MB/s]

Fusing layers…
YOLOv5s summary: 213 layers, 7225885 parameters, 0 gradients
Adding AutoShape…

```python
[6]: model
```

```
[6]: AutoShape(
       (model): DetectMultiBackend(
         (model): DetectionModel(
           (model): Sequential(
             (0): Conv(
               (conv): Conv2d(3, 32, kernel_size=(6, 6), stride=(2, 2), padding=(2,
     2))
               (act): SiLU(inplace=True)
             )
             (1): Conv(
               (conv): Conv2d(32, 64, kernel_size=(3, 3), stride=(2, 2), padding=(1,
     1))
               (act): SiLU(inplace=True)
             )
             (2): C3(
               (cv1): Conv(
```

```
        (conv): Conv2d(64, 32, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (cv2): Conv(
        (conv): Conv2d(64, 32, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (cv3): Conv(
        (conv): Conv2d(64, 64, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (m): Sequential(
        (0): Bottleneck(
          (cv1): Conv(
            (conv): Conv2d(32, 32, kernel_size=(1, 1), stride=(1, 1))
            (act): SiLU(inplace=True)
          )
          (cv2): Conv(
            (conv): Conv2d(32, 32, kernel_size=(3, 3), stride=(1, 1),
padding=(1, 1))
            (act): SiLU(inplace=True)
          )
        )
      )
    )
    (3): Conv(
      (conv): Conv2d(64, 128, kernel_size=(3, 3), stride=(2, 2), padding=(1,
1))
      (act): SiLU(inplace=True)
    )
    (4): C3(
      (cv1): Conv(
        (conv): Conv2d(128, 64, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (cv2): Conv(
        (conv): Conv2d(128, 64, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (cv3): Conv(
        (conv): Conv2d(128, 128, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (m): Sequential(
        (0): Bottleneck(
          (cv1): Conv(
            (conv): Conv2d(64, 64, kernel_size=(1, 1), stride=(1, 1))
```

```
              (act): SiLU(inplace=True)
            )
            (cv2): Conv(
              (conv): Conv2d(64, 64, kernel_size=(3, 3), stride=(1, 1),
padding=(1, 1))
              (act): SiLU(inplace=True)
            )
          )
          (1): Bottleneck(
            (cv1): Conv(
              (conv): Conv2d(64, 64, kernel_size=(1, 1), stride=(1, 1))
              (act): SiLU(inplace=True)
            )
            (cv2): Conv(
              (conv): Conv2d(64, 64, kernel_size=(3, 3), stride=(1, 1),
padding=(1, 1))
              (act): SiLU(inplace=True)
            )
          )
        )
      )
      (5): Conv(
        (conv): Conv2d(128, 256, kernel_size=(3, 3), stride=(2, 2),
padding=(1, 1))
        (act): SiLU(inplace=True)
      )
      (6): C3(
        (cv1): Conv(
          (conv): Conv2d(256, 128, kernel_size=(1, 1), stride=(1, 1))
          (act): SiLU(inplace=True)
        )
        (cv2): Conv(
          (conv): Conv2d(256, 128, kernel_size=(1, 1), stride=(1, 1))
          (act): SiLU(inplace=True)
        )
        (cv3): Conv(
          (conv): Conv2d(256, 256, kernel_size=(1, 1), stride=(1, 1))
          (act): SiLU(inplace=True)
        )
        (m): Sequential(
          (0): Bottleneck(
            (cv1): Conv(
              (conv): Conv2d(128, 128, kernel_size=(1, 1), stride=(1, 1))
              (act): SiLU(inplace=True)
            )
            (cv2): Conv(
              (conv): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1),
```

```
padding=(1, 1))
              (act): SiLU(inplace=True)
            )
          )
          (1): Bottleneck(
            (cv1): Conv(
              (conv): Conv2d(128, 128, kernel_size=(1, 1), stride=(1, 1))
              (act): SiLU(inplace=True)
            )
            (cv2): Conv(
              (conv): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1),
padding=(1, 1))
              (act): SiLU(inplace=True)
            )
          )
          (2): Bottleneck(
            (cv1): Conv(
              (conv): Conv2d(128, 128, kernel_size=(1, 1), stride=(1, 1))
              (act): SiLU(inplace=True)
            )
            (cv2): Conv(
              (conv): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1),
padding=(1, 1))
              (act): SiLU(inplace=True)
            )
          )
        )
      )
      (7): Conv(
        (conv): Conv2d(256, 512, kernel_size=(3, 3), stride=(2, 2),
padding=(1, 1))
        (act): SiLU(inplace=True)
      )
      (8): C3(
        (cv1): Conv(
          (conv): Conv2d(512, 256, kernel_size=(1, 1), stride=(1, 1))
          (act): SiLU(inplace=True)
        )
        (cv2): Conv(
          (conv): Conv2d(512, 256, kernel_size=(1, 1), stride=(1, 1))
          (act): SiLU(inplace=True)
        )
        (cv3): Conv(
          (conv): Conv2d(512, 512, kernel_size=(1, 1), stride=(1, 1))
          (act): SiLU(inplace=True)
        )
        (m): Sequential(
```

```
      (0): Bottleneck(
        (cv1): Conv(
          (conv): Conv2d(256, 256, kernel_size=(1, 1), stride=(1, 1))
          (act): SiLU(inplace=True)
        )
        (cv2): Conv(
          (conv): Conv2d(256, 256, kernel_size=(3, 3), stride=(1, 1),
padding=(1, 1))
          (act): SiLU(inplace=True)
        )
      )
    )
  )
  (9): SPPF(
    (cv1): Conv(
      (conv): Conv2d(512, 256, kernel_size=(1, 1), stride=(1, 1))
      (act): SiLU(inplace=True)
    )
    (cv2): Conv(
      (conv): Conv2d(1024, 512, kernel_size=(1, 1), stride=(1, 1))
      (act): SiLU(inplace=True)
    )
    (m): MaxPool2d(kernel_size=5, stride=1, padding=2, dilation=1,
ceil_mode=False)
  )
  (10): Conv(
    (conv): Conv2d(512, 256, kernel_size=(1, 1), stride=(1, 1))
    (act): SiLU(inplace=True)
  )
  (11): Upsample(scale_factor=2.0, mode='nearest')
  (12): Concat()
  (13): C3(
    (cv1): Conv(
      (conv): Conv2d(512, 128, kernel_size=(1, 1), stride=(1, 1))
      (act): SiLU(inplace=True)
    )
    (cv2): Conv(
      (conv): Conv2d(512, 128, kernel_size=(1, 1), stride=(1, 1))
      (act): SiLU(inplace=True)
    )
    (cv3): Conv(
      (conv): Conv2d(256, 256, kernel_size=(1, 1), stride=(1, 1))
      (act): SiLU(inplace=True)
    )
    (m): Sequential(
      (0): Bottleneck(
        (cv1): Conv(
```

```
          (conv): Conv2d(128, 128, kernel_size=(1, 1), stride=(1, 1))
          (act): SiLU(inplace=True)
        )
        (cv2): Conv(
          (conv): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1),
padding=(1, 1))
          (act): SiLU(inplace=True)
        )
      )
    )
  )
  (14): Conv(
    (conv): Conv2d(256, 128, kernel_size=(1, 1), stride=(1, 1))
    (act): SiLU(inplace=True)
  )
  (15): Upsample(scale_factor=2.0, mode='nearest')
  (16): Concat()
  (17): C3(
    (cv1): Conv(
      (conv): Conv2d(256, 64, kernel_size=(1, 1), stride=(1, 1))
      (act): SiLU(inplace=True)
    )
    (cv2): Conv(
      (conv): Conv2d(256, 64, kernel_size=(1, 1), stride=(1, 1))
      (act): SiLU(inplace=True)
    )
    (cv3): Conv(
      (conv): Conv2d(128, 128, kernel_size=(1, 1), stride=(1, 1))
      (act): SiLU(inplace=True)
    )
    (m): Sequential(
      (0): Bottleneck(
        (cv1): Conv(
          (conv): Conv2d(64, 64, kernel_size=(1, 1), stride=(1, 1))
          (act): SiLU(inplace=True)
        )
        (cv2): Conv(
          (conv): Conv2d(64, 64, kernel_size=(3, 3), stride=(1, 1),
padding=(1, 1))
          (act): SiLU(inplace=True)
        )
      )
    )
  )
  (18): Conv(
    (conv): Conv2d(128, 128, kernel_size=(3, 3), stride=(2, 2),
padding=(1, 1))
```

```
      (act): SiLU(inplace=True)
    )
    (19): Concat()
    (20): C3(
      (cv1): Conv(
        (conv): Conv2d(256, 128, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (cv2): Conv(
        (conv): Conv2d(256, 128, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (cv3): Conv(
        (conv): Conv2d(256, 256, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (m): Sequential(
        (0): Bottleneck(
          (cv1): Conv(
            (conv): Conv2d(128, 128, kernel_size=(1, 1), stride=(1, 1))
            (act): SiLU(inplace=True)
          )
          (cv2): Conv(
            (conv): Conv2d(128, 128, kernel_size=(3, 3), stride=(1, 1),
padding=(1, 1))
            (act): SiLU(inplace=True)
          )
        )
      )
    )
    (21): Conv(
      (conv): Conv2d(256, 256, kernel_size=(3, 3), stride=(2, 2),
padding=(1, 1))
      (act): SiLU(inplace=True)
    )
    (22): Concat()
    (23): C3(
      (cv1): Conv(
        (conv): Conv2d(512, 256, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (cv2): Conv(
        (conv): Conv2d(512, 256, kernel_size=(1, 1), stride=(1, 1))
        (act): SiLU(inplace=True)
      )
      (cv3): Conv(
        (conv): Conv2d(512, 512, kernel_size=(1, 1), stride=(1, 1))
```

```
              (act): SiLU(inplace=True)
            )
            (m): Sequential(
              (0): Bottleneck(
                (cv1): Conv(
                  (conv): Conv2d(256, 256, kernel_size=(1, 1), stride=(1, 1))
                  (act): SiLU(inplace=True)
                )
                (cv2): Conv(
                  (conv): Conv2d(256, 256, kernel_size=(3, 3), stride=(1, 1),
    padding=(1, 1))
                  (act): SiLU(inplace=True)
                )
              )
            )
          )
          (24): Detect(
            (m): ModuleList(
              (0): Conv2d(128, 255, kernel_size=(1, 1), stride=(1, 1))
              (1): Conv2d(256, 255, kernel_size=(1, 1), stride=(1, 1))
              (2): Conv2d(512, 255, kernel_size=(1, 1), stride=(1, 1))
            )
          )
        )
      )
    )
  )
```

[18]:
```python
img =  'https://images.indianexpress.com/2016/08/traffic-jam-7591.jpg'
```

[19]:
```python
results = model(img)
results.print()
```

```
image 1/1: 422x759 10 persons, 23 cars, 7 motorcycles, 1 bus
Speed: 7230.9ms pre-process, 31.4ms inference, 0.0ms NMS per image at shape (1,
3, 384, 640)
```

[20]:
```python
#to show it int he notebbok
%matplotlib inline
#imshow displays the img on screen
plt.imshow(np.squeeze(results.render()))
plt.show()
```
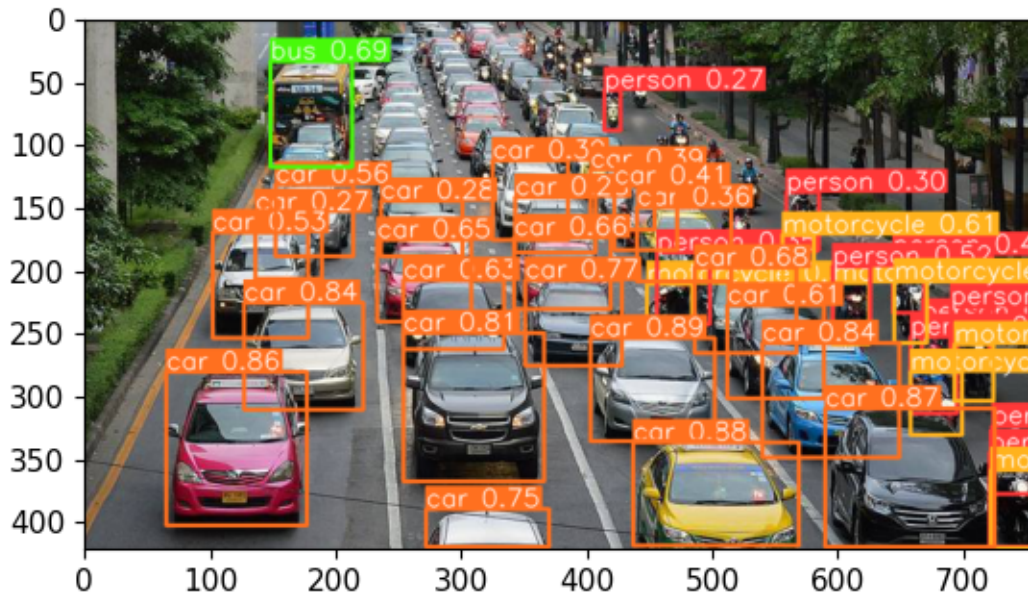
```
[16]: results.render()
```

```
[16]: [array([[[72, 48, 38],
              [74, 50, 40],
              [73, 51, 40],
              ...,
              [56, 21, 25],
              [54, 20, 21],
              [51, 15, 17]],

             [[71, 47, 37],
              [71, 47, 37],
              [70, 48, 37],
              ...,
              [55, 20, 24],
              [52, 16, 18],
              [47, 11, 13]],

             [[75, 51, 41],
              [72, 50, 39],
              [70, 48, 37],
              ...,
              [56, 20, 24],
              [52, 16, 20],
              [48, 12, 16]],

             ...,
```

```
[[40, 43, 48],
 [41, 44, 49],
 [40, 43, 48],
 ...,
 [35, 49, 49],
 [35, 49, 49],
 [36, 50, 50]],

[[39, 42, 47],
 [39, 42, 49],
 [39, 42, 49],
 ...,
 [35, 49, 50],
 [35, 49, 50],
 [36, 50, 51]],

[[38, 41, 48],
 [38, 41, 48],
 [38, 41, 48],
 ...,
 [35, 49, 50],
 [35, 49, 50],
 [36, 50, 51]]], dtype=uint8)]
```

[17]: `results.show()`
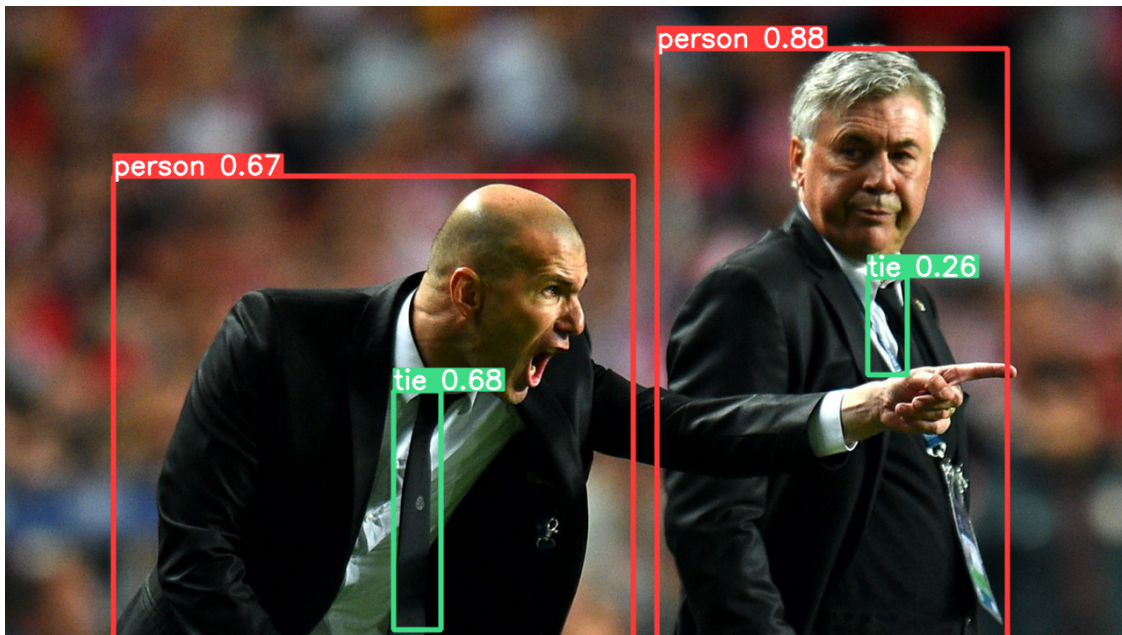
```python
[23]: #real time detections
      #if you want ot use any other video you can add the path in videocapture
      cap = cv2.VideoCapture(0)
      while cap.isOpened():
          ret,frame = cap.read()
          #make detections
          results = model(frame)

          cv2.imshow('Detection',np.squeeze(results.render()))
          if cv2.waitKey(10) & 0xFF == ord('q'):
              break
      cap.release()
      cv2.destroyAllWindows()
```

```python
[24]: #Train from Scratch
      import uuid#unique identifier
      import os
      import time
```

```python
[25]: IMAGES_PATH = os.path.join('data','images')
      labels = ['awake','drowsy']
      number_imgs  = 20
```

```python
[29]: cap = cv2.VideoCapture(0)
      for label in labels:
          print('Collecting images for {}'.format(label))
          time.sleep(5)
          #loop through images
          for img_num in range(number_imgs):
              print('collecting images for {},image numvber{}'.format(label,img_num))
              ret,frame = cap.read()
              imgname  = os.path.join(IMAGES_PATH,label+'.'+str(uuid.uuid1())+'.jpg')
              cv2.imwrite(imgname,frame)
              cv2.imshow('Image Collection',frame)
              time.sleep(2)
              if cv2.waitKey(10) & 0xFF == ord('q'):
                      break
      cap.release()
      cv2.destroyAllWindows()
```

```
Collecting images for awake
collecting images for awake,image numvber0
collecting images for awake,image numvber1
collecting images for awake,image numvber2
collecting images for awake,image numvber3
collecting images for awake,image numvber4
collecting images for awake,image numvber5
```

```
collecting images for awake,image numvber6
collecting images for awake,image numvber7
collecting images for awake,image numvber8
collecting images for awake,image numvber9
collecting images for awake,image numvber10
collecting images for awake,image numvber11
collecting images for awake,image numvber12
collecting images for awake,image numvber13
collecting images for awake,image numvber14
collecting images for awake,image numvber15
collecting images for awake,image numvber16
collecting images for awake,image numvber17
collecting images for awake,image numvber18
collecting images for awake,image numvber19
Collecting images for drowsy
collecting images for drowsy,image numvber0
collecting images for drowsy,image numvber1
collecting images for drowsy,image numvber2
collecting images for drowsy,image numvber3
collecting images for drowsy,image numvber4
collecting images for drowsy,image numvber5
collecting images for drowsy,image numvber6
collecting images for drowsy,image numvber7
collecting images for drowsy,image numvber8
collecting images for drowsy,image numvber9
collecting images for drowsy,image numvber10
collecting images for drowsy,image numvber11
collecting images for drowsy,image numvber12
collecting images for drowsy,image numvber13
collecting images for drowsy,image numvber14
collecting images for drowsy,image numvber15
collecting images for drowsy,image numvber16
collecting images for drowsy,image numvber17
collecting images for drowsy,image numvber18
collecting images for drowsy,image numvber19
```

[30]: `!git clone https://github.com/heartexlabs/labelImg`

```
Cloning into 'labelImg'…
```

[31]:
```
!pip install pyqt5 lxml --upgrade
!cd labelImg && pyrcc5 -o libs/resources.py resources.qrc
```

```
Collecting pyqt5
  Downloading PyQt5-5.15.9-cp37-abi3-win_amd64.whl (6.8 MB)
     ------------------------------------ 6.8/6.8 MB 10.9 MB/s eta 0:00:00
Requirement already satisfied: lxml in c:\users\kiit\anaconda3\lib\site-packages
(4.9.1)
```

```
Collecting lxml
  Downloading lxml-4.9.3-cp39-cp39-win_amd64.whl (3.9 MB)
     ------------------------------------ 3.9/3.9 MB 11.3 MB/s eta 0:00:00
Collecting PyQt5-sip<13,>=12.11
  Downloading PyQt5_sip-12.12.1-cp39-cp39-win_amd64.whl (78 kB)
     ------------------------------------ 78.4/78.4 kB ? eta 0:00:00
Collecting PyQt5-Qt5>=5.15.2
  Downloading PyQt5_Qt5-5.15.2-py3-none-win_amd64.whl (50.1 MB)
     ------------------------------------ 50.1/50.1 MB 15.2 MB/s eta 0:00:00
Installing collected packages: PyQt5-Qt5, PyQt5-sip, lxml, pyqt5
  Attempting uninstall: lxml
    Found existing installation: lxml 4.9.1
    Uninstalling lxml-4.9.1:
      Successfully uninstalled lxml-4.9.1
Successfully installed PyQt5-Qt5-5.15.2 PyQt5-sip-12.12.1 lxml-4.9.3
pyqt5-5.15.9

ERROR: pip's dependency resolver does not currently take into account all the
packages that are installed. This behaviour is the source of the following
dependency conflicts.
spyder 5.2.2 requires pyqtwebengine<5.13, which is not installed.
spyder 5.2.2 requires pyqt5<5.13, but you have pyqt5 5.15.9 which is
incompatible.
```

[33]: `!pip install PyQtWebEngine`

```
Collecting PyQtWebEngine
  Downloading PyQtWebEngine-5.15.6-cp37-abi3-win_amd64.whl (182 kB)
     ------------------------------------ 182.7/182.7 kB 1.8 MB/s eta 0:00:00
Requirement already satisfied: PyQt5-sip<13,>=12.11 in
c:\users\kiit\anaconda3\lib\site-packages (from PyQtWebEngine) (12.12.1)
Requirement already satisfied: PyQt5>=5.15.4 in
c:\users\kiit\anaconda3\lib\site-packages (from PyQtWebEngine) (5.15.9)
Collecting PyQtWebEngine-Qt5>=5.15.0
  Downloading PyQtWebEngine_Qt5-5.15.2-py3-none-win_amd64.whl (60.0 MB)
     ------------------------------------ 60.0/60.0 MB 11.7 MB/s eta 0:00:00
Requirement already satisfied: PyQt5-Qt5>=5.15.2 in
c:\users\kiit\anaconda3\lib\site-packages (from PyQt5>=5.15.4->PyQtWebEngine)
(5.15.2)
Installing collected packages: PyQtWebEngine-Qt5, PyQtWebEngine
Successfully installed PyQtWebEngine-5.15.6 PyQtWebEngine-Qt5-5.15.2

ERROR: pip's dependency resolver does not currently take into account all the
packages that are installed. This behaviour is the source of the following
dependency conflicts.
spyder 5.2.2 requires pyqt5<5.13, but you have pyqt5 5.15.9 which is
incompatible.
spyder 5.2.2 requires pyqtwebengine<5.13, but you have pyqtwebengine 5.15.6
which is incompatible.
```

```
[34]: !git clone yolov5 & pip install -r requirments.txty
```

```
fatal: repository 'yolov5' does not exist
ERROR: Could not open requirements file: [Errno 2] No such file or directory:
'requirments.txt'
```

```
[39]: !git clone https://github.com/ultralytics/yolov5
```

```
fatal: destination path 'yolov5' already exists and is not an empty directory.
```

```
[40]: !cd yolov5 & pip install -r requirements.txt
```

```
Requirement already satisfied: gitpython>=3.1.30 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 5))
(3.1.31)
Requirement already satisfied: matplotlib>=3.3 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 6))
(3.5.2)
Requirement already satisfied: numpy>=1.18.5 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 7))
(1.24.3)
Requirement already satisfied: opencv-python>=4.1.1 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 8))
(4.8.0.74)
Requirement already satisfied: Pillow>=7.1.2 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 9))
(9.2.0)
Requirement already satisfied: psutil in c:\users\kiit\anaconda3\lib\site-
packages (from -r requirements.txt (line 10)) (5.9.0)
Requirement already satisfied: PyYAML>=5.3.1 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 11))
(6.0)
Requirement already satisfied: requests>=2.23.0 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 12))
(2.28.1)
Requirement already satisfied: scipy>=1.4.1 in c:\users\kiit\anaconda3\lib\site-
packages (from -r requirements.txt (line 13)) (1.9.1)
Requirement already satisfied: thop>=0.1.1 in c:\users\kiit\anaconda3\lib\site-
packages (from -r requirements.txt (line 14)) (0.1.1.post2209072238)
Requirement already satisfied: torch>=1.7.0 in c:\users\kiit\anaconda3\lib\site-
packages (from -r requirements.txt (line 15)) (2.0.1+cu117)
Requirement already satisfied: torchvision>=0.8.1 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 16))
(0.15.2+cu117)
Requirement already satisfied: tqdm>=4.64.0 in c:\users\kiit\anaconda3\lib\site-
packages (from -r requirements.txt (line 17)) (4.64.1)
Requirement already satisfied: ultralytics>=8.0.111 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 18))
```

```
(8.0.131)
Requirement already satisfied: pandas>=1.1.4 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 27))
(1.4.4)
Requirement already satisfied: seaborn>=0.11.0 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 28))
(0.11.2)
Requirement already satisfied: setuptools>=65.5.1 in
c:\users\kiit\anaconda3\lib\site-packages (from -r requirements.txt (line 42))
(68.0.0)
Requirement already satisfied: gitdb<5,>=4.0.1 in
c:\users\kiit\anaconda3\lib\site-packages (from gitpython>=3.1.30->-r
requirements.txt (line 5)) (4.0.10)
Requirement already satisfied: python-dateutil>=2.7 in
c:\users\kiit\anaconda3\lib\site-packages (from matplotlib>=3.3->-r
requirements.txt (line 6)) (2.8.2)
Requirement already satisfied: cycler>=0.10 in c:\users\kiit\anaconda3\lib\site-
packages (from matplotlib>=3.3->-r requirements.txt (line 6)) (0.11.0)
Requirement already satisfied: pyparsing>=2.2.1 in
c:\users\kiit\anaconda3\lib\site-packages (from matplotlib>=3.3->-r
requirements.txt (line 6)) (3.0.9)
Requirement already satisfied: packaging>=20.0 in
c:\users\kiit\anaconda3\lib\site-packages (from matplotlib>=3.3->-r
requirements.txt (line 6)) (21.3)
Requirement already satisfied: kiwisolver>=1.0.1 in
c:\users\kiit\anaconda3\lib\site-packages (from matplotlib>=3.3->-r
requirements.txt (line 6)) (1.4.2)
Requirement already satisfied: fonttools>=4.22.0 in
c:\users\kiit\anaconda3\lib\site-packages (from matplotlib>=3.3->-r
requirements.txt (line 6)) (4.25.0)
Requirement already satisfied: idna<4,>=2.5 in c:\users\kiit\anaconda3\lib\site-
packages (from requests>=2.23.0->-r requirements.txt (line 12)) (3.3)
Requirement already satisfied: certifi>=2017.4.17 in
c:\users\kiit\anaconda3\lib\site-packages (from requests>=2.23.0->-r
requirements.txt (line 12)) (2022.12.7)
Requirement already satisfied: charset-normalizer<3,>=2 in
c:\users\kiit\anaconda3\lib\site-packages (from requests>=2.23.0->-r
requirements.txt (line 12)) (2.0.4)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in
c:\users\kiit\anaconda3\lib\site-packages (from requests>=2.23.0->-r
requirements.txt (line 12)) (1.26.11)
Requirement already satisfied: typing-extensions in
c:\users\kiit\anaconda3\lib\site-packages (from torch>=1.7.0->-r
requirements.txt (line 15)) (4.3.0)
Requirement already satisfied: sympy in c:\users\kiit\anaconda3\lib\site-
packages (from torch>=1.7.0->-r requirements.txt (line 15)) (1.10.1)
Requirement already satisfied: networkx in c:\users\kiit\anaconda3\lib\site-
packages (from torch>=1.7.0->-r requirements.txt (line 15)) (2.8.4)
```

Requirement already satisfied: filelock in c:\users\kiit\anaconda3\lib\site-packages (from torch>=1.7.0->-r requirements.txt (line 15)) (3.6.0)
Requirement already satisfied: jinja2 in c:\users\kiit\anaconda3\lib\site-packages (from torch>=1.7.0->-r requirements.txt (line 15)) (2.11.3)
Requirement already satisfied: colorama in c:\users\kiit\anaconda3\lib\site-packages (from tqdm>=4.64.0->-r requirements.txt (line 17)) (0.4.5)
Requirement already satisfied: pytz>=2020.1 in c:\users\kiit\anaconda3\lib\site-packages (from pandas>=1.1.4->-r requirements.txt (line 27)) (2022.1)
Requirement already satisfied: smmap<6,>=3.0.1 in c:\users\kiit\anaconda3\lib\site-packages (from gitdb<5,>=4.0.1->gitpython>=3.1.30->-r requirements.txt (line 5)) (5.0.0)
Requirement already satisfied: six>=1.5 in c:\users\kiit\anaconda3\lib\site-packages (from python-dateutil>=2.7->matplotlib>=3.3->-r requirements.txt (line 6)) (1.16.0)
Requirement already satisfied: MarkupSafe>=0.23 in c:\users\kiit\anaconda3\lib\site-packages (from jinja2->torch>=1.7.0->-r requirements.txt (line 15)) (2.0.1)
Requirement already satisfied: mpmath>=0.19 in c:\users\kiit\anaconda3\lib\site-packages (from sympy->torch>=1.7.0->-r requirements.txt (line 15)) (1.2.1)

```python
[49]: import torch
      torch.cuda.empty_cache()
```

```python
[50]: t = torch.cuda.get_device_properties(0).total_memory
      r = torch.cuda.memory_reserved(0)
      a = torch.cuda.memory_allocated(0)
      f = r-a  # free inside reserved
```

```python
[55]: r
```

```
[55]: 71303168
```

```python
[53]: !cd yolov5 && python train.py --img 320 --batch 5 --epochs 500 --data dataset.
      ↪yaml --weights yolov5s.pt --workers 2
```

```
train: weights=yolov5s.pt, cfg=, data=dataset.yaml,
hyp=data\hyps\hyp.scratch-low.yaml, epochs=500, batch_size=5, imgsz=320,
rect=False, resume=False, nosave=False, noval=False, noautoanchor=False,
noplots=False, evolve=None, bucket=, cache=None, image_weights=False, device=,
multi_scale=False, single_cls=False, optimizer=SGD, sync_bn=False, workers=2,
project=runs\train, name=exp, exist_ok=False, quad=False, cos_lr=False,
label_smoothing=0.0, patience=100, freeze=[0], save_period=-1, seed=0,
local_rank=-1, entity=None, upload_dataset=False, bbox_interval=-1,
artifact_alias=latest
github: up to date with https://github.com/ultralytics/yolov5
YOLOv5  v7.0-193-g485da42 Python-3.9.13 torch-2.0.1+cu117 CUDA:0 (GeForce MX330,
2048MiB)
```

hyperparameters: lr0=0.01, lrf=0.01, momentum=0.937, weight_decay=0.0005, warmup_epochs=3.0, warmup_momentum=0.8, warmup_bias_lr=0.1, box=0.05, cls=0.5, cls_pw=1.0, obj=1.0, obj_pw=1.0, iou_t=0.2, anchor_t=4.0, fl_gamma=0.0, hsv_h=0.015, hsv_s=0.7, hsv_v=0.4, degrees=0.0, translate=0.1, scale=0.5, shear=0.0, perspective=0.0, flipud=0.0, fliplr=0.5, mosaic=1.0, mixup=0.0, copy_paste=0.0

Comet: run 'pip install comet_ml' to automatically track and visualize YOLOv5 runs in Comet

TensorBoard: Start with 'tensorboard --logdir runs\train', view at http://localhost:6006/

Overriding model.yaml nc=80 with nc=17

```
                 from  n    params  module                                     arguments
  0                -1  1      3520  models.common.Conv                         [3, 32, 6, 2, 2]
  1                -1  1     18560  models.common.Conv                         [32, 64, 3, 2]
  2                -1  1     18816  models.common.C3                           [64, 64, 1]
  3                -1  1     73984  models.common.Conv                         [64, 128, 3, 2]
  4                -1  2    115712  models.common.C3                           [128, 128, 2]
  5                -1  1    295424  models.common.Conv                         [128, 256, 3, 2]
  6                -1  3    625152  models.common.C3                           [256, 256, 3]
  7                -1  1   1180672  models.common.Conv                         [256, 512, 3, 2]
  8                -1  1   1182720  models.common.C3                           [512, 512, 1]
  9                -1  1    656896  models.common.SPPF                         [512, 512, 5]
 10                -1  1    131584  models.common.Conv                         [512, 256, 1, 1]
 11                -1  1         0  torch.nn.modules.upsampling.Upsample       [None, 2, 'nearest']
 12           [-1, 6]  1         0  models.common.Concat                       [1]
 13                -1  1    361984  models.common.C3                           [512, 256, 1, False]
 14                -1  1     33024  models.common.Conv                         [256, 128, 1, 1]
 15                -1  1         0  torch.nn.modules.upsampling.Upsample       [None, 2, 'nearest']
 16           [-1, 4]  1         0  models.common.Concat                       [1]
 17                -1  1     90880  models.common.C3                           [256, 128, 1, False]
```

```
 18              -1  1     147712  models.common.Conv
[128, 128, 3, 2]
 19         [-1, 14]  1          0  models.common.Concat                      [1]
 20              -1  1     296448  models.common.C3
[256, 256, 1, False]
 21              -1  1     590336  models.common.Conv
[256, 256, 3, 2]
 22         [-1, 10]  1          0  models.common.Concat                      [1]
 23              -1  1    1182720  models.common.C3
[512, 512, 1, False]
 24     [17, 20, 23]  1      59334  models.yolo.Detect                        [17,
[[10, 13, 16, 30, 33, 23], [30, 61, 62, 45, 59, 119], [116, 90, 156, 198, 373,
326]], [128, 256, 512]]
Model summary: 214 layers, 7065478 parameters, 7065478 gradients, 16.1 GFLOPs

Transferred 343/349 items from yolov5s.pt
AMP: checks passed
optimizer: SGD(lr=0.01) with parameter groups 57 weight(decay=0.0),
60 weight(decay=0.0005078125), 60 bias

train: Scanning
C:\Users\KIIT\Desktop\drowsiness_detection\data\labels.cache… 40 images, 0
backgrounds, 0 corrupt: 100%|##########| 40/40 [00:00<?, ?it/s]
train: Scanning
C:\Users\KIIT\Desktop\drowsiness_detection\data\labels.cache… 40 images, 0
backgrounds, 0 corrupt: 100%|##########| 40/40 [00:00<?, ?it/s]

val: Scanning
C:\Users\KIIT\Desktop\drowsiness_detection\data\labels.cache… 40 images, 0
backgrounds, 0 corrupt: 100%|##########| 40/40 [00:00<?, ?it/s]
val: Scanning
C:\Users\KIIT\Desktop\drowsiness_detection\data\labels.cache… 40 images, 0
backgrounds, 0 corrupt: 100%|##########| 40/40 [00:00<?, ?it/s]

AutoAnchor: 5.57 anchors/target, 1.000 Best Possible Recall (BPR).
Current anchors are a good fit to dataset
Plotting labels to runs\train\exp4\labels.jpg…
Image sizes 320 train, 320 val
Using 2 dataloader workers
Logging results to runs\train\exp4
Starting training for 500 epochs…

      Epoch    GPU_mem    box_loss    obj_loss    cls_loss   Instances        Size

  0%|          | 0/8 [00:00<?, ?it/s]
      0/499     0.371G      0.1162      0.0166     0.07386          13         320:
0%|          | 0/8 [00:00<?, ?it/s]
      0/499     0.371G      0.1162      0.0166     0.07386          13         320:
```

```
12%|#2          | 1/8 [00:02<00:18,  2.67s/it]
      0/499     0.384G     0.1141    0.01593    0.07682        11        320:
12%|#2          | 1/8 [00:03<00:18,  2.67s/it]
      0/499     0.384G     0.1141    0.01593    0.07682        11        320:
25%|##5         | 2/8 [00:03<00:07,  1.31s/it]
      0/499     0.384G     0.1133    0.01657    0.07756        14        320:
25%|##5         | 2/8 [00:03<00:07,  1.31s/it]
      0/499     0.384G     0.1125     0.0157    0.07694        10        320:
38%|###7        | 3/8 [00:03<00:04,  1.15it/s]
      0/499     0.384G     0.1125     0.0157    0.07694        10        320:
38%|###7        | 3/8 [00:03<00:04,  1.15it/s]
      0/499     0.384G     0.1123    0.01593    0.07745        13        320:
50%|#####       | 4/8 [00:03<00:02,  1.52it/s]
      0/499     0.384G     0.1123    0.01593    0.07745        13        320:
50%|#####       | 4/8 [00:04<00:02,  1.52it/s]
      0/499     0.384G     0.1108    0.01588    0.07729        10        320:
62%|######2     | 5/8 [00:04<00:01,  1.90it/s]
      0/499     0.384G     0.1108    0.01588    0.07729        10        320:
62%|######2     | 5/8 [00:04<00:01,  1.90it/s]
      0/499     0.298G     0.1103    0.01537    0.07754         8        320:
75%|#######5    | 6/8 [00:04<00:00,  2.22it/s]
      0/499     0.298G     0.1103    0.01537    0.07754         8        320:
75%|#######5    | 6/8 [00:04<00:00,  2.22it/s]
      0/499     0.306G     0.1093    0.01555    0.07689        12        320:
88%|########7   | 7/8 [00:04<00:00,  2.46it/s]
      0/499     0.306G     0.1093    0.01555    0.07689        12        320:
88%|########7   | 7/8 [00:05<00:00,  2.46it/s]
      0/499     0.306G     0.1093    0.01555    0.07689        12        320:
100%|##########| 8/8 [00:05<00:00,  2.24it/s]
      0/499     0.306G     0.1093    0.01555    0.07689        12        320:
100%|##########| 8/8 [00:05<00:00,  1.55it/s]


              Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|            | 0/4 [00:00<?, ?it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  25%|##5        | 1/4 [00:00<00:00,  6.00it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 2/4 [00:00<00:00,  6.61it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5   | 3/4 [00:00<00:00,  6.02it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 4/4 [00:00<00:00,  6.09it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 4/4 [00:00<00:00,  6.12it/s]
                all         40         40      0.002      0.075    0.00135
0.000209

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size
```

```
   0%|          | 0/8 [00:00<?, ?it/s]
    1/499      0.365G     0.1109     0.01678     0.07441         13        320:
  0%|          | 0/8 [00:00<?, ?it/s]
    1/499      0.365G     0.1109     0.01678     0.07441         13        320:
 12%|#2        | 1/8 [00:00<00:04,  1.57it/s]
    1/499      0.346G     0.1134     0.01473     0.07661          9        320:
 12%|#2        | 1/8 [00:01<00:04,  1.57it/s]
    1/499      0.346G     0.1134     0.01473     0.07661          9        320:
 25%|##5       | 2/8 [00:01<00:04,  1.47it/s]
    1/499       0.35G     0.1123     0.01444     0.07682         11        320:
 25%|##5       | 2/8 [00:02<00:04,  1.47it/s]
    1/499       0.35G     0.1123     0.01444     0.07682         11        320:
 38%|###7      | 3/8 [00:02<00:03,  1.48it/s]
    1/499      0.346G     0.1105     0.01676     0.07495         16        320:
 38%|###7      | 3/8 [00:02<00:03,  1.48it/s]
    1/499      0.346G     0.1105     0.01676     0.07495         16        320:
 50%|#####     | 4/8 [00:02<00:02,  1.56it/s]
    1/499      0.352G     0.1059     0.01559     0.07475          7        320:
 50%|#####     | 4/8 [00:03<00:02,  1.56it/s]
    1/499      0.352G     0.1059     0.01559     0.07475          7        320:
 62%|######2   | 5/8 [00:03<00:01,  1.58it/s]
    1/499      0.348G     0.1038     0.01605     0.07412         12        320:
 62%|######2   | 5/8 [00:03<00:01,  1.58it/s]
    1/499      0.348G     0.1038     0.01605     0.07412         12        320:
 75%|#######5  | 6/8 [00:03<00:01,  1.67it/s]
    1/499      0.352G      0.102     0.01544     0.07671          7        320:
 75%|#######5  | 6/8 [00:04<00:01,  1.67it/s]
    1/499      0.352G      0.102     0.01544     0.07671          7        320:
 88%|########7 | 7/8 [00:04<00:00,  1.72it/s]
    1/499       0.35G     0.1005     0.01488     0.07903          6        320:
 88%|########7 | 7/8 [00:04<00:00,  1.72it/s]
    1/499       0.35G     0.1005     0.01488     0.07903          6        320:
100%|##########| 8/8 [00:04<00:00,  1.69it/s]
    1/499       0.35G     0.1005     0.01488     0.07903          6        320:
100%|##########| 8/8 [00:04<00:00,  1.63it/s]

                 Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|          | 0/4 [00:00<?, ?it/s]
                 Class     Images  Instances          P          R      mAP50
mAP50-95:  25%|##5       | 1/4 [00:00<00:00,  3.59it/s]
                 Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####     | 2/4 [00:00<00:00,  3.92it/s]
                 Class     Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5  | 3/4 [00:00<00:00,  3.86it/s]
                 Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 4/4 [00:01<00:00,  3.59it/s]
                 Class     Images  Instances          P          R      mAP50
```

```
mAP50-95: 100%|##########| 4/4 [00:01<00:00,  3.67it/s]
                all         40         40    0.00553        0.2    0.00378
0.000567


        Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

   0%|           | 0/8 [00:00<?, ?it/s]
      2/499     0.338G     0.0998    0.01419    0.08444          9       320:
0%|           | 0/8 [00:00<?, ?it/s]
      2/499     0.338G     0.0998    0.01419    0.08444          9       320:
12%|#2         | 1/8 [00:00<00:04,  1.47it/s]
      2/499     0.342G    0.09882    0.01769    0.07728         13       320:
12%|#2         | 1/8 [00:01<00:04,  1.47it/s]
      2/499     0.342G    0.09882    0.01769    0.07728         13       320:
25%|##5        | 2/8 [00:01<00:04,  1.45it/s]
      2/499      0.34G    0.09845     0.0173    0.07707         11       320:
25%|##5        | 2/8 [00:02<00:04,  1.45it/s]
      2/499      0.34G    0.09845     0.0173    0.07707         11       320:
38%|###7       | 3/8 [00:02<00:03,  1.48it/s]
      2/499     0.342G    0.09902    0.01609    0.07609          8       320:
38%|###7       | 3/8 [00:02<00:03,  1.48it/s]
      2/499     0.342G    0.09902    0.01609    0.07609          8       320:
50%|#####      | 4/8 [00:02<00:02,  1.57it/s]
      2/499     0.348G    0.09824    0.01639     0.0754         10       320:
50%|#####      | 4/8 [00:03<00:02,  1.57it/s]
      2/499     0.348G    0.09824    0.01639     0.0754         10       320:
62%|######2    | 5/8 [00:03<00:01,  1.56it/s]
      2/499     0.346G    0.09786    0.01692    0.07537         13       320:
62%|######2    | 5/8 [00:03<00:01,  1.56it/s]
      2/499     0.346G    0.09786    0.01692    0.07537         13       320:
75%|#######5   | 6/8 [00:03<00:01,  1.56it/s]
      2/499     0.342G     0.0956    0.01824    0.07477         13       320:
75%|#######5   | 6/8 [00:04<00:01,  1.56it/s]
      2/499     0.342G     0.0956    0.01824    0.07477         13       320:
88%|########7  | 7/8 [00:04<00:00,  1.56it/s]
      2/499     0.348G    0.09595    0.01835    0.07427         12       320:
88%|########7  | 7/8 [00:05<00:00,  1.56it/s]
      2/499     0.348G    0.09595    0.01835    0.07427         12       320:
100%|##########| 8/8 [00:05<00:00,  1.58it/s]
      2/499     0.348G    0.09595    0.01835    0.07427         12       320:
100%|##########| 8/8 [00:05<00:00,  1.55it/s]


              Class     Images  Instances          P          R      mAP50
mAP50-95:    0%|           | 0/4 [00:00<?, ?it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   25%|##5        | 1/4 [00:00<00:00,  5.54it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   50%|#####      | 2/4 [00:00<00:00,  5.60it/s]
```

```
              Class     Images  Instances          P          R       mAP50
mAP50-95:  75%|#######5 | 3/4 [00:00<00:00,  5.52it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 4/4 [00:00<00:00,  5.23it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 4/4 [00:00<00:00,  5.34it/s]
                all         40         40    0.00559      0.225     0.00601
0.000973

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/8 [00:00<?, ?it/s]
      3/499     0.354G     0.0944    0.02383    0.06988         14        320:
0%|           | 0/8 [00:00<?, ?it/s]
      3/499     0.354G     0.0944    0.02383    0.06988         14        320:
12%|#2        | 1/8 [00:00<00:04,  1.67it/s]
      3/499     0.357G     0.0956    0.01999    0.06908          9        320:
12%|#2        | 1/8 [00:01<00:04,  1.67it/s]
      3/499     0.357G     0.0956    0.01999    0.06908          9        320:
25%|##5       | 2/8 [00:01<00:03,  1.68it/s]
      3/499      0.35G    0.09451    0.02212    0.06815         14        320:
25%|##5       | 2/8 [00:01<00:03,  1.68it/s]
      3/499      0.35G    0.09451    0.02212    0.06815         14        320:
38%|###7      | 3/8 [00:01<00:02,  1.77it/s]
      3/499     0.392G    0.09182    0.02312    0.06746         13        320:
38%|###7      | 3/8 [00:02<00:02,  1.77it/s]
      3/499     0.392G    0.09182    0.02312    0.06746         13        320:
50%|#####     | 4/8 [00:02<00:01,  2.15it/s]
      3/499     0.352G    0.09037    0.02338    0.06707         12        320:
50%|#####     | 4/8 [00:02<00:01,  2.15it/s]
      3/499     0.352G    0.09037    0.02338    0.06707         12        320:
62%|######2   | 5/8 [00:02<00:01,  2.04it/s]
      3/499     0.392G    0.09027     0.0228    0.06821         11        320:
62%|######2   | 5/8 [00:02<00:01,  2.04it/s]
      3/499     0.392G    0.09027     0.0228    0.06821         11        320:
75%|#######5  | 6/8 [00:02<00:00,  2.30it/s]
      3/499     0.392G    0.08555    0.02148    0.06502          7        320:
75%|#######5  | 6/8 [00:03<00:00,  2.30it/s]
      3/499     0.392G    0.08555    0.02148    0.06502          7        320:
88%|########7 | 7/8 [00:03<00:00,  2.64it/s]
      3/499     0.338G    0.08455    0.02162    0.06554         11        320:
88%|########7 | 7/8 [00:04<00:00,  2.64it/s]
      3/499     0.338G    0.08455    0.02162    0.06554         11        320:
100%|##########| 8/8 [00:04<00:00,  1.83it/s]
      3/499     0.338G    0.08455    0.02162    0.06554         11        320:
100%|##########| 8/8 [00:04<00:00,  1.97it/s]

              Class     Images  Instances          P          R       mAP50
```

```
mAP50-95:    0%|             | 0/4 [00:00<?, ?it/s]
                Class       Images  Instances          P          R       mAP50
mAP50-95:   25%|##5         | 1/4 [00:00<00:00,  5.73it/s]
                Class       Images  Instances          P          R       mAP50
mAP50-95:   50%|#####       | 2/4 [00:00<00:00,  5.86it/s]
                Class       Images  Instances          P          R       mAP50
mAP50-95:   75%|#######5    | 3/4 [00:00<00:00,  5.83it/s]
                Class       Images  Instances          P          R       mAP50
mAP50-95:  100%|##########| 4/4 [00:00<00:00,  6.00it/s]
                Class       Images  Instances          P          R       mAP50
mAP50-95:  100%|##########| 4/4 [00:00<00:00,  5.93it/s]
                  all          40          40     0.0071      0.375      0.0154
    0.0022

        Epoch    GPU_mem    box_loss    obj_loss    cls_loss  Instances        Size

    0%|             | 0/8 [00:00<?, ?it/s]
    0%|             | 0/8 [00:00<?, ?it/s]
Traceback (most recent call last):
  File "C:\Users\KIIT\Desktop\drowsiness_detection\yolov5\train.py", line 647,
in <module>
    main(opt)
  File "C:\Users\KIIT\Desktop\drowsiness_detection\yolov5\train.py", line 536,
in main
    train(opt.hyp, opt, device, callbacks)
  File "C:\Users\KIIT\Desktop\drowsiness_detection\yolov5\train.py", line 325,
in train
    scaler.scale(loss).backward()
  File "C:\Users\KIIT\anaconda3\lib\site-packages\torch\_tensor.py", line 487,
in backward
    torch.autograd.backward(
  File "C:\Users\KIIT\anaconda3\lib\site-packages\torch\autograd\__init__.py",
line 200, in backward
    Variable._execution_engine.run_backward(  # Calls into the C++ engine to run
the backward pass
torch.cuda.OutOfMemoryError: CUDA out of memory. Tried to allocate 2.00 MiB (GPU
0; 2.00 GiB total capacity; 294.00 MiB already allocated; 1002.80 KiB free;
360.00 MiB reserved in total by PyTorch) If reserved memory is >> allocated
memory try setting max_split_size_mb to avoid fragmentation.  See documentation
for Memory Management and PYTORCH_CUDA_ALLOC_CONF
```

[56]: `torch.cuda.empty_cache()`

[57]:
```
!cd yolov5 && python train.py --img 320 --batch 1 --epochs 500 --data dataset.
  yaml --weights yolov5s.pt --workers 2
```

```
train: weights=yolov5s.pt, cfg=, data=dataset.yaml,
hyp=data\hyps\hyp.scratch-low.yaml, epochs=500, batch_size=1, imgsz=320,
```

rect=False, resume=False, nosave=False, noval=False, noautoanchor=False,
noplots=False, evolve=None, bucket=, cache=None, image_weights=False, device=,
multi_scale=False, single_cls=False, optimizer=SGD, sync_bn=False, workers=2,
project=runs\train, name=exp, exist_ok=False, quad=False, cos_lr=False,
label_smoothing=0.0, patience=100, freeze=[0], save_period=-1, seed=0,
local_rank=-1, entity=None, upload_dataset=False, bbox_interval=-1,
artifact_alias=latest
github: up to date with https://github.com/ultralytics/yolov5
YOLOv5 v7.0-193-g485da42 Python-3.9.13 torch-2.0.1+cu117 CUDA:0 (GeForce MX330,
2048MiB)

hyperparameters: lr0=0.01, lrf=0.01, momentum=0.937,
weight_decay=0.0005, warmup_epochs=3.0, warmup_momentum=0.8, warmup_bias_lr=0.1,
box=0.05, cls=0.5, cls_pw=1.0, obj=1.0, obj_pw=1.0, iou_t=0.2, anchor_t=4.0,
fl_gamma=0.0, hsv_h=0.015, hsv_s=0.7, hsv_v=0.4, degrees=0.0, translate=0.1,
scale=0.5, shear=0.0, perspective=0.0, flipud=0.0, fliplr=0.5, mosaic=1.0,
mixup=0.0, copy_paste=0.0
Comet: run 'pip install comet_ml' to automatically track and
visualize YOLOv5 runs in Comet
TensorBoard: Start with 'tensorboard --logdir runs\train', view at
http://localhost:6006/
Overriding model.yaml nc=80 with nc=17

```
                 from  n    params  module
arguments
  0                -1  1       3520  models.common.Conv                          [3,
32, 6, 2, 2]
  1                -1  1      18560  models.common.Conv                          [32,
64, 3, 2]
  2                -1  1      18816  models.common.C3                            [64,
64, 1]
  3                -1  1      73984  models.common.Conv                          [64,
128, 3, 2]
  4                -1  2     115712  models.common.C3
[128, 128, 2]
  5                -1  1     295424  models.common.Conv
[128, 256, 3, 2]
  6                -1  3     625152  models.common.C3
[256, 256, 3]
  7                -1  1    1180672  models.common.Conv
[256, 512, 3, 2]
  8                -1  1    1182720  models.common.C3
[512, 512, 1]
  9                -1  1     656896  models.common.SPPF
[512, 512, 5]
 10                -1  1     131584  models.common.Conv
[512, 256, 1, 1]
 11                -1  1          0  torch.nn.modules.upsampling.Upsample
```

```
[None, 2, 'nearest']
 12              [-1, 6]  1         0  models.common.Concat                    [1]
 13                  -1   1    361984  models.common.C3
[512, 256, 1, False]
 14                  -1   1     33024  models.common.Conv
[256, 128, 1, 1]
 15                  -1   1         0  torch.nn.modules.upsampling.Upsample
[None, 2, 'nearest']
 16              [-1, 4]  1         0  models.common.Concat                    [1]
 17                  -1   1     90880  models.common.C3
[256, 128, 1, False]
 18                  -1   1    147712  models.common.Conv
[128, 128, 3, 2]
 19             [-1, 14]  1         0  models.common.Concat                    [1]
 20                  -1   1    296448  models.common.C3
[256, 256, 1, False]
 21                  -1   1    590336  models.common.Conv
[256, 256, 3, 2]
 22             [-1, 10]  1         0  models.common.Concat                    [1]
 23                  -1   1   1182720  models.common.C3
[512, 512, 1, False]
 24         [17, 20, 23]  1     59334  models.yolo.Detect                      [17,
[[10, 13, 16, 30, 33, 23], [30, 61, 62, 45, 59, 119], [116, 90, 156, 198, 373,
326]], [128, 256, 512]]
Model summary: 214 layers, 7065478 parameters, 7065478 gradients, 16.1 GFLOPs

Transferred 343/349 items from yolov5s.pt
AMP: checks passed
optimizer: SGD(lr=0.01) with parameter groups 57 weight(decay=0.0),
60 weight(decay=0.0005), 60 bias

train: Scanning
C:\Users\KIIT\Desktop\drowsiness_detection\data\labels.cache… 40 images, 0
backgrounds, 0 corrupt: 100%|##########| 40/40 [00:00<?, ?it/s]
train: Scanning
C:\Users\KIIT\Desktop\drowsiness_detection\data\labels.cache… 40 images, 0
backgrounds, 0 corrupt: 100%|##########| 40/40 [00:00<?, ?it/s]

val: Scanning
C:\Users\KIIT\Desktop\drowsiness_detection\data\labels.cache… 40 images, 0
backgrounds, 0 corrupt: 100%|##########| 40/40 [00:00<?, ?it/s]
val: Scanning
C:\Users\KIIT\Desktop\drowsiness_detection\data\labels.cache… 40 images, 0
backgrounds, 0 corrupt: 100%|##########| 40/40 [00:00<?, ?it/s]

AutoAnchor: 5.57 anchors/target, 1.000 Best Possible Recall (BPR).
Current anchors are a good fit to dataset
Plotting labels to runs\train\exp5\labels.jpg…
```

Image sizes 320 train, 320 val
Using 0 dataloader workers
Logging results to **runs\train\exp5**
Starting training for 500 epochs…

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances	Size

```
  0%|           | 0/40 [00:00<?, ?it/s]
    0/499    0.157G     0.1212    0.01955    0.08477         4       320:
0%|           | 0/40 [00:00<?, ?it/s]
    0/499    0.157G     0.1212    0.01955    0.08477         4       320:
2%|2         | 1/40 [00:02<01:18,  2.02s/it]
    0/499     0.18G     0.1042    0.01898    0.09018         3       320:
2%|2         | 1/40 [00:02<01:18,  2.02s/it]
    0/499     0.18G     0.1042    0.01898    0.09018         3       320:
5%|5         | 2/40 [00:02<00:36,  1.04it/s]
    0/499    0.206G     0.1018    0.01829     0.0909         2       320:
5%|5         | 2/40 [00:02<00:36,  1.04it/s]
    0/499    0.206G     0.1018    0.01829     0.0909         2       320:
8%|7         | 3/40 [00:02<00:23,  1.61it/s]
    0/499    0.206G    0.09485    0.01625    0.07923         2       320:
8%|7         | 3/40 [00:02<00:23,  1.61it/s]
    0/499    0.206G    0.09485    0.01625    0.07923         2       320:
10%|#         | 4/40 [00:02<00:15,  2.28it/s]
    0/499    0.206G    0.09155    0.01475    0.07235         1       320:
10%|#         | 4/40 [00:02<00:15,  2.28it/s]
    0/499    0.206G    0.09155    0.01475    0.07235         1       320:
12%|#2        | 5/40 [00:02<00:11,  2.97it/s]
    0/499    0.206G    0.09423    0.01722    0.07355         4       320:
12%|#2        | 5/40 [00:02<00:11,  2.97it/s]
    0/499    0.206G    0.09423    0.01722    0.07355         4       320:
15%|#5        | 6/40 [00:02<00:09,  3.70it/s]
    0/499    0.206G    0.09159     0.0162    0.06993         1       320:
15%|#5        | 6/40 [00:03<00:09,  3.70it/s]
    0/499    0.206G    0.09159     0.0162    0.06993         1       320:
18%|#7        | 7/40 [00:03<00:08,  4.02it/s]
    0/499    0.206G    0.08532    0.01512    0.06406         2       320:
18%|#7        | 7/40 [00:03<00:08,  4.02it/s]
    0/499    0.206G    0.08532    0.01512    0.06406         2       320:
20%|##        | 8/40 [00:03<00:06,  4.66it/s]
    0/499    0.206G    0.08536    0.01457    0.06237         2       320:
20%|##        | 8/40 [00:03<00:06,  4.66it/s]
    0/499    0.206G    0.08536    0.01457    0.06237         2       320:
22%|##2       | 9/40 [00:03<00:06,  5.09it/s]
    0/499    0.206G    0.08408    0.01396    0.06075         1       320:
22%|##2       | 9/40 [00:03<00:06,  5.09it/s]
    0/499    0.206G    0.08408    0.01396    0.06075         1       320:
25%|##5       | 10/40 [00:03<00:05,  5.42it/s]
```

```
         0/499       0.206G      0.08644     0.01536      0.0626        4           320:
25%|##5       | 10/40 [00:03<00:05,  5.42it/s]
         0/499       0.206G      0.08644     0.01536      0.0626        4           320:
28%|##7       | 11/40 [00:03<00:05,  5.67it/s]
         0/499       0.206G      0.08514     0.01477     0.06195        1           320:
28%|##7       | 11/40 [00:03<00:05,  5.67it/s]
         0/499       0.206G      0.08514     0.01477     0.06195        1           320:
30%|###       | 12/40 [00:03<00:04,  6.04it/s]
         0/499       0.206G      0.08773     0.01553     0.06303        4           320:
30%|###       | 12/40 [00:04<00:04,  6.04it/s]
         0/499       0.206G      0.08773     0.01553     0.06303        4           320:
32%|###2      | 13/40 [00:04<00:04,  6.15it/s]
         0/499       0.206G      0.08649     0.01514     0.06185        1           320:
32%|###2      | 13/40 [00:04<00:04,  6.15it/s]
         0/499       0.206G      0.08649     0.01514     0.06185        1           320:
35%|###5      | 14/40 [00:04<00:04,  6.22it/s]
         0/499       0.206G      0.08587     0.01471     0.06067        1           320:
35%|###5      | 14/40 [00:04<00:04,  6.22it/s]
         0/499       0.206G      0.08587     0.01471     0.06067        1           320:
38%|###7      | 15/40 [00:04<00:04,  5.92it/s]
         0/499       0.206G      0.08466     0.01443     0.05991        1           320:
38%|###7      | 15/40 [00:04<00:04,  5.92it/s]
         0/499       0.206G      0.08466     0.01443     0.05991        1           320:
40%|####      | 16/40 [00:04<00:03,  6.06it/s]
         0/499       0.206G      0.08701     0.01437     0.06009        2           320:
40%|####      | 16/40 [00:04<00:03,  6.06it/s]
         0/499       0.206G      0.08701     0.01437     0.06009        2           320:
42%|####2     | 17/40 [00:04<00:03,  5.96it/s]
         0/499       0.206G      0.08643     0.01404     0.05966        1           320:
42%|####2     | 17/40 [00:04<00:03,  5.96it/s]
         0/499       0.206G      0.08643     0.01404     0.05966        1           320:
45%|####5     | 18/40 [00:04<00:03,  6.09it/s]
         0/499       0.206G       0.0871     0.01413     0.06135        2           320:
45%|####5     | 18/40 [00:05<00:03,  6.09it/s]
         0/499       0.206G       0.0871     0.01413     0.06135        2           320:
48%|####7     | 19/40 [00:05<00:03,  6.18it/s]
         0/499       0.206G      0.08629     0.01391     0.06074        1           320:
48%|####7     | 19/40 [00:05<00:03,  6.18it/s]
         0/499       0.206G      0.08629     0.01391     0.06074        1           320:
50%|#####     | 20/40 [00:05<00:03,  6.00it/s]
         0/499       0.206G      0.08694     0.01471     0.06173        4           320:
50%|#####     | 20/40 [00:05<00:03,  6.00it/s]
         0/499       0.206G      0.08694     0.01471     0.06173        4           320:
52%|#####2    | 21/40 [00:05<00:03,  5.97it/s]
         0/499       0.206G      0.08726      0.0148     0.06274        2           320:
52%|#####2    | 21/40 [00:05<00:03,  5.97it/s]
         0/499       0.206G      0.08726      0.0148     0.06274        2           320:
55%|#####5    | 22/40 [00:05<00:02,  6.09it/s]
```

28

```
     0/499      0.206G      0.08813      0.01533      0.06342         4          320:
55%|#####5   | 22/40 [00:05<00:02,  6.09it/s]
     0/499      0.206G      0.08813      0.01533      0.06342         4          320:
57%|#####7   | 23/40 [00:05<00:02,  6.17it/s]
     0/499      0.206G      0.08876      0.01523      0.06411         2          320:
57%|#####7   | 23/40 [00:05<00:02,  6.17it/s]
     0/499      0.206G      0.08876      0.01523      0.06411         2          320:
60%|######   | 24/40 [00:05<00:02,  5.89it/s]
     0/499      0.206G      0.08817      0.01522      0.06351         2          320:
60%|######   | 24/40 [00:06<00:02,  5.89it/s]
     0/499      0.206G      0.08817      0.01522      0.06351         2          320:
62%|######2  | 25/40 [00:06<00:02,  6.03it/s]
     0/499      0.206G      0.08908      0.01579      0.06388         4          320:
62%|######2  | 25/40 [00:06<00:02,  6.03it/s]
     0/499      0.206G      0.08908      0.01579      0.06388         4          320:
65%|######5  | 26/40 [00:06<00:02,  5.97it/s]
     0/499      0.206G      0.08882      0.01585      0.0644          2          320:
65%|######5  | 26/40 [00:06<00:02,  5.97it/s]
     0/499      0.206G      0.08882      0.01585      0.0644          2          320:
68%|######7  | 27/40 [00:06<00:02,  5.97it/s]
     0/499      0.206G      0.08803      0.01566      0.06373         1          320:
68%|######7  | 27/40 [00:06<00:02,  5.97it/s]
     0/499      0.206G      0.08803      0.01566      0.06373         1          320:
70%|#######  | 28/40 [00:06<00:02,  5.92it/s]
     0/499      0.206G      0.08754      0.01543      0.06342         1          320:
70%|#######  | 28/40 [00:06<00:02,  5.92it/s]
     0/499      0.206G      0.08754      0.01543      0.06342         1          320:
72%|#######2 | 29/40 [00:06<00:01,  5.89it/s]
     0/499      0.206G      0.08719      0.01521      0.06295         1          320:
72%|#######2 | 29/40 [00:06<00:01,  5.89it/s]
     0/499      0.206G      0.08719      0.01521      0.06295         1          320:
75%|#######5 | 30/40 [00:06<00:01,  5.96it/s]
     0/499      0.206G      0.08836      0.01532      0.06353         4          320:
75%|#######5 | 30/40 [00:07<00:01,  5.96it/s]
     0/499      0.206G      0.08836      0.01532      0.06353         4          320:
78%|#######7 | 31/40 [00:07<00:01,  5.92it/s]
     0/499      0.206G      0.08749      0.01513      0.06281         1          320:
78%|#######7 | 31/40 [00:07<00:01,  5.92it/s]
     0/499      0.206G      0.08749      0.01513      0.06281         1          320:
80%|######## | 32/40 [00:07<00:01,  5.58it/s]
     0/499      0.206G      0.08765      0.01523      0.06328         2          320:
80%|######## | 32/40 [00:07<00:01,  5.58it/s]
     0/499      0.206G      0.08765      0.01523      0.06328         2          320:
82%|########2| 33/40 [00:07<00:01,  5.69it/s]
     0/499      0.206G      0.08813      0.01581      0.06368         4          320:
82%|########2| 33/40 [00:07<00:01,  5.69it/s]
     0/499      0.206G      0.08813      0.01581      0.06368         4          320:
85%|########5| 34/40 [00:07<00:01,  5.88it/s]
```

```
      0/499      0.206G      0.08751      0.01589      0.06319           2           320:
 85%|#######5 | 34/40 [00:07<00:01,  5.88it/s]
      0/499      0.206G      0.08751      0.01589      0.06319           2           320:
 88%|#######7 | 35/40 [00:07<00:00,  5.86it/s]
      0/499      0.206G      0.08774      0.01586      0.06347           2           320:
 88%|#######7 | 35/40 [00:07<00:00,  5.86it/s]
      0/499      0.206G      0.08774      0.01586      0.06347           2           320:
 90%|######### | 36/40 [00:07<00:00,  5.94it/s]
      0/499      0.206G      0.08834      0.01623      0.06366           4           320:
 90%|######### | 36/40 [00:08<00:00,  5.94it/s]
      0/499      0.206G      0.08834      0.01623      0.06366           4           320:
 92%|#########2| 37/40 [00:08<00:00,  6.07it/s]
      0/499      0.206G      0.08788       0.0162      0.06316           2           320:
 92%|#########2| 37/40 [00:08<00:00,  6.07it/s]
      0/499      0.206G      0.08788       0.0162      0.06316           2           320:
 95%|#########5| 38/40 [00:08<00:00,  6.16it/s]
      0/499      0.206G      0.08718      0.01605      0.06286           1           320:
 95%|#########5| 38/40 [00:08<00:00,  6.16it/s]
      0/499      0.206G      0.08718      0.01605      0.06286           1           320:
 98%|#########7| 39/40 [00:08<00:00,  6.07it/s]
      0/499      0.206G      0.08666      0.01609       0.0625           2           320:
 98%|#########7| 39/40 [00:08<00:00,  6.07it/s]
      0/499      0.206G      0.08666      0.01609       0.0625           2           320:
100%|##########| 40/40 [00:08<00:00,  6.29it/s]
      0/499      0.206G      0.08666      0.01609       0.0625           2           320:
100%|##########| 40/40 [00:08<00:00,  4.69it/s]

             Class      Images  Instances          P          R       mAP50
mAP50-95:   0%|           | 0/20 [00:00<?, ?it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 15.98it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  25%|##5        | 5/20 [00:00<00:00, 19.27it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  35%|###5       | 7/20 [00:00<00:00, 19.47it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 20.66it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  65%|######5    | 13/20 [00:00<00:00, 20.92it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 21.07it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  95%|#########5| 19/20 [00:00<00:00, 21.12it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:00<00:00, 20.59it/s]
               all          40          40      0.0118        0.35      0.0265
0.00362
```

```
          Epoch     GPU_mem   box_loss   obj_loss   cls_loss  Instances        Size

   0%|              | 0/40 [00:00<?, ?it/s]
        1/499       0.206G     0.1134    0.02758    0.07119          4        320:
 0%|              | 0/40 [00:00<?, ?it/s]
        1/499       0.206G     0.1134    0.02758    0.07119          4        320:
 2%|2            | 1/40 [00:00<00:05,  6.52it/s]
        1/499       0.206G     0.1123    0.02736    0.07032          4        320:
 2%|2            | 1/40 [00:00<00:05,  6.52it/s]
        1/499       0.206G     0.1123    0.02736    0.07032          4        320:
 5%|5            | 2/40 [00:00<00:05,  6.45it/s]
        1/499       0.206G    0.09731    0.02374    0.06336          2        320:
 5%|5            | 2/40 [00:00<00:05,  6.45it/s]
        1/499       0.206G    0.09731    0.02374    0.06336          2        320:
 8%|7            | 3/40 [00:00<00:05,  6.42it/s]
        1/499       0.206G    0.09024    0.02217    0.05951          2        320:
 8%|7            | 3/40 [00:00<00:05,  6.42it/s]
        1/499       0.206G    0.09024    0.02217    0.05951          2        320:
10%|#            | 4/40 [00:00<00:05,  6.66it/s]
        1/499       0.206G    0.09439     0.0228    0.06315          4        320:
10%|#            | 4/40 [00:00<00:05,  6.66it/s]
        1/499       0.206G    0.09439     0.0228    0.06315          4        320:
12%|#2           | 5/40 [00:00<00:05,  6.33it/s]
        1/499       0.206G    0.09063    0.02146    0.06083          2        320:
12%|#2           | 5/40 [00:00<00:05,  6.33it/s]
        1/499       0.206G    0.09063    0.02146    0.06083          2        320:
15%|#5           | 6/40 [00:00<00:05,  6.35it/s]
        1/499       0.206G    0.08496    0.01981    0.05913          1        320:
15%|#5           | 6/40 [00:01<00:05,  6.35it/s]
        1/499       0.206G    0.08496    0.01981    0.05913          1        320:
18%|#7           | 7/40 [00:01<00:05,  6.35it/s]
        1/499       0.206G    0.08631    0.02155     0.0611          4        320:
18%|#7           | 7/40 [00:01<00:05,  6.35it/s]
        1/499       0.206G    0.08631    0.02155     0.0611          4        320:
20%|##           | 8/40 [00:01<00:05,  6.35it/s]
IOPub data rate exceeded.
The notebook server will temporarily stop sending output
to the client in order to avoid crashing it.
To change this limit, set the config variable
`--NotebookApp.iopub_data_rate_limit`.

Current values:
NotebookApp.iopub_data_rate_limit=1000000.0 (bytes/sec)
NotebookApp.rate_limit_window=3.0 (secs)

      423/499      0.206G     0.0222   0.008925    0.02035          2        320:
40%|####         | 16/40 [00:03<00:04,  5.65it/s]
      423/499      0.206G     0.0222   0.008925    0.02035          2        320:
```

```
42%|####2      | 17/40 [00:03<00:04,  5.55it/s]
    423/499      0.206G      0.0214    0.008593     0.02015          1        320:
42%|####2      | 17/40 [00:03<00:04,  5.55it/s]
    423/499      0.206G      0.0214    0.008593     0.02015          1        320:
45%|####5      | 18/40 [00:03<00:03,  5.61it/s]
    423/499      0.206G      0.0209    0.008351     0.01996          1        320:
45%|####5      | 18/40 [00:03<00:03,  5.61it/s]
    423/499      0.206G      0.0209    0.008351     0.01996          1        320:
48%|####7      | 19/40 [00:03<00:03,  5.67it/s]
    423/499      0.206G      0.02082   0.008596      0.0202          4        320:
48%|####7      | 19/40 [00:03<00:03,  5.67it/s]
    423/499      0.206G      0.02082   0.008596      0.0202          4        320:
50%|#####      | 20/40 [00:03<00:03,  5.71it/s]
    423/499      0.206G      0.02022   0.008379     0.02009          1        320:
50%|#####      | 20/40 [00:03<00:03,  5.71it/s]
    423/499      0.206G      0.02022   0.008379     0.02009          1        320:
52%|#####2     | 21/40 [00:03<00:03,  5.73it/s]
    423/499      0.206G      0.02189   0.008348      0.0207          2        320:
52%|#####2     | 21/40 [00:04<00:03,  5.73it/s]
    423/499      0.206G      0.02189   0.008348      0.0207          2        320:
55%|#####5     | 22/40 [00:04<00:03,  5.46it/s]
    423/499      0.206G      0.02224   0.008225     0.02059          2        320:
55%|#####5     | 22/40 [00:04<00:03,  5.46it/s]
    423/499      0.206G      0.02224   0.008225     0.02059          2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.42it/s]
    423/499      0.206G      0.02236   0.008676     0.02063          4        320:
57%|#####7     | 23/40 [00:04<00:03,  5.42it/s]
    423/499      0.206G      0.02236   0.008676     0.02063          4        320:
60%|######     | 24/40 [00:04<00:02,  5.49it/s]
    423/499      0.206G      0.02322   0.008784     0.02043          2        320:
60%|######     | 24/40 [00:04<00:02,  5.49it/s]
    423/499      0.206G      0.02322   0.008784     0.02043          2        320:
62%|######2    | 25/40 [00:04<00:02,  5.59it/s]
    423/499      0.206G      0.02278   0.008594     0.02028          1        320:
62%|######2    | 25/40 [00:04<00:02,  5.59it/s]
    423/499      0.206G      0.02278   0.008594     0.02028          1        320:
65%|######5    | 26/40 [00:04<00:02,  5.51it/s]
    423/499      0.206G      0.02256   0.008837     0.02012          4        320:
65%|######5    | 26/40 [00:04<00:02,  5.51it/s]
    423/499      0.206G      0.02256   0.008837     0.02012          4        320:
68%|######7    | 27/40 [00:04<00:02,  5.61it/s]
    423/499      0.206G      0.02243   0.008806     0.01998          1        320:
68%|######7    | 27/40 [00:05<00:02,  5.61it/s]
    423/499      0.206G      0.02243   0.008806     0.01998          1        320:
70%|#######    | 28/40 [00:05<00:02,  5.67it/s]
    423/499      0.206G      0.02197   0.008736     0.01996          2        320:
70%|#######    | 28/40 [00:05<00:02,  5.67it/s]
    423/499      0.206G      0.02197   0.008736     0.01996          2        320:
```

```
72%|#######2  | 29/40 [00:05<00:01,  5.71it/s]
    423/499     0.206G    0.02194   0.008831   0.02005       4       320:
72%|#######2  | 29/40 [00:05<00:01,  5.71it/s]
    423/499     0.206G    0.02194   0.008831   0.02005       4       320:
75%|#######5  | 30/40 [00:05<00:01,  5.58it/s]
    423/499     0.206G    0.02161   0.008746   0.01993       2       320:
75%|#######5  | 30/40 [00:05<00:01,  5.58it/s]
    423/499     0.206G    0.02161   0.008746   0.01993       2       320:
78%|#######7  | 31/40 [00:05<00:01,  5.65it/s]
    423/499     0.206G    0.02119   0.008576   0.01974       1       320:
78%|#######7  | 31/40 [00:05<00:01,  5.65it/s]
    423/499     0.206G    0.02119   0.008576   0.01974       1       320:
80%|########  | 32/40 [00:05<00:01,  5.55it/s]
    423/499     0.206G    0.02161   0.008564    0.0197       2       320:
80%|########  | 32/40 [00:06<00:01,  5.55it/s]
    423/499     0.206G    0.02161   0.008564    0.0197       2       320:
82%|########2 | 33/40 [00:06<00:01,  5.60it/s]
    423/499     0.206G    0.02181   0.008536    0.0204       2       320:
82%|########2 | 33/40 [00:06<00:01,  5.60it/s]
    423/499     0.206G    0.02181   0.008536    0.0204       2       320:
85%|########5 | 34/40 [00:06<00:01,  5.52it/s]
    423/499     0.206G    0.02143   0.008408   0.02052       1       320:
85%|########5 | 34/40 [00:06<00:01,  5.52it/s]
    423/499     0.206G    0.02143   0.008408   0.02052       1       320:
88%|########7 | 35/40 [00:06<00:00,  5.60it/s]
    423/499     0.206G    0.02106    0.00833   0.02038       1       320:
88%|########7 | 35/40 [00:06<00:00,  5.60it/s]
    423/499     0.206G    0.02106    0.00833   0.02038       1       320:
90%|######### | 36/40 [00:06<00:00,  5.49it/s]
    423/499     0.206G     0.0209   0.008334    0.0202       2       320:
90%|######### | 36/40 [00:06<00:00,  5.49it/s]
    423/499     0.206G     0.0209   0.008334    0.0202       2       320:
92%|#########2| 37/40 [00:06<00:00,  5.59it/s]
    423/499     0.206G    0.02123   0.008284   0.02007       2       320:
92%|#########2| 37/40 [00:06<00:00,  5.59it/s]
    423/499     0.206G    0.02123   0.008284   0.02007       2       320:
95%|#########5| 38/40 [00:06<00:00,  5.51it/s]
    423/499     0.206G    0.02097   0.008192     0.02        1       320:
95%|#########5| 38/40 [00:07<00:00,  5.51it/s]
    423/499     0.206G    0.02097   0.008192     0.02        1       320:
98%|#########7| 39/40 [00:07<00:00,  5.60it/s]
    423/499     0.206G    0.02116   0.008259    0.0201       4       320:
98%|#########7| 39/40 [00:07<00:00,  5.60it/s]
    423/499     0.206G    0.02116   0.008259    0.0201       4       320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]
    423/499     0.206G    0.02116   0.008259    0.0201       4       320:
100%|##########| 40/40 [00:07<00:00,  5.50it/s]
```

```
              Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|           | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 13.75it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:01, 13.32it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 15.20it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 15.51it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 16.40it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 16.15it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 16.79it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 17.24it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.55it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.77it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.56it/s]
                all         40         40       0.98      0.985      0.995
0.76

      Epoch     GPU_mem    box_loss    obj_loss    cls_loss   Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    424/499     0.206G     0.01367    0.004213     0.01494          1       320:
0%|         | 0/40 [00:00<?, ?it/s]
    424/499     0.206G     0.01367    0.004213     0.01494          1       320:
2%|2        | 1/40 [00:00<00:07,  5.33it/s]
    424/499     0.206G     0.02376    0.006481     0.01599          2       320:
2%|2        | 1/40 [00:00<00:07,  5.33it/s]
    424/499     0.206G     0.02376    0.006481     0.01599          2       320:
5%|5        | 2/40 [00:00<00:06,  5.59it/s]
    424/499     0.206G     0.01999    0.005354     0.01576          1       320:
5%|5        | 2/40 [00:00<00:06,  5.59it/s]
    424/499     0.206G     0.01999    0.005354     0.01576          1       320:
8%|7        | 3/40 [00:00<00:06,  5.69it/s]
    424/499     0.206G     0.02391     0.00874     0.01857          4       320:
8%|7        | 3/40 [00:00<00:06,  5.69it/s]
    424/499     0.206G     0.02391     0.00874     0.01857          4       320:
10%|#        | 4/40 [00:00<00:06,  5.34it/s]
    424/499     0.206G     0.02393     0.01069     0.01964          4       320:
10%|#        | 4/40 [00:00<00:06,  5.34it/s]
```

```
    424/499     0.206G    0.02393    0.01069    0.01964        4        320:
12%|#2        | 5/40 [00:00<00:06,  5.33it/s]
    424/499     0.206G     0.0224    0.01041    0.01927        2        320:
12%|#2        | 5/40 [00:01<00:06,  5.33it/s]
    424/499     0.206G     0.0224    0.01041    0.01927        2        320:
15%|#5        | 6/40 [00:01<00:06,  5.65it/s]
    424/499     0.206G    0.02453    0.01113    0.01982        4        320:
15%|#5        | 6/40 [00:01<00:06,  5.65it/s]
    424/499     0.206G    0.02453    0.01113    0.01982        4        320:
18%|#7        | 7/40 [00:01<00:06,  5.38it/s]
    424/499     0.206G    0.02232    0.01016    0.01968        1        320:
18%|#7        | 7/40 [00:01<00:06,  5.38it/s]
    424/499     0.206G    0.02232    0.01016    0.01968        1        320:
20%|##        | 8/40 [00:01<00:05,  5.52it/s]
    424/499     0.206G    0.02243   0.009885    0.01964        2        320:
20%|##        | 8/40 [00:01<00:05,  5.52it/s]
    424/499     0.206G    0.02243   0.009885    0.01964        2        320:
22%|##2       | 9/40 [00:01<00:05,  5.45it/s]
    424/499     0.206G    0.02396   0.009662    0.01928        2        320:
22%|##2       | 9/40 [00:01<00:05,  5.45it/s]
    424/499     0.206G    0.02396   0.009662    0.01928        2        320:
25%|##5       | 10/40 [00:01<00:05,  5.54it/s]
    424/499     0.206G    0.02292   0.009079    0.01924        1        320:
25%|##5       | 10/40 [00:02<00:05,  5.54it/s]
    424/499     0.206G    0.02292   0.009079    0.01924        1        320:
28%|##7       | 11/40 [00:02<00:05,  5.34it/s]
    424/499     0.206G    0.02167   0.008607    0.01947        1        320:
28%|##7       | 11/40 [00:02<00:05,  5.34it/s]
    424/499     0.206G    0.02167   0.008607    0.01947        1        320:
30%|###       | 12/40 [00:02<00:05,  5.48it/s]
    424/499     0.206G    0.02209   0.009121    0.01979        4        320:
30%|###       | 12/40 [00:02<00:05,  5.48it/s]
    424/499     0.206G    0.02209   0.009121    0.01979        4        320:
32%|###2      | 13/40 [00:02<00:04,  5.56it/s]
    424/499     0.206G    0.02334   0.008979    0.02027        3        320:
32%|###2      | 13/40 [00:02<00:04,  5.56it/s]
    424/499     0.206G    0.02334   0.008979    0.02027        3        320:
35%|###5      | 14/40 [00:02<00:04,  5.63it/s]
    424/499     0.206G    0.02386    0.00955    0.02032        4        320:
35%|###5      | 14/40 [00:02<00:04,  5.63it/s]
    424/499     0.206G    0.02386    0.00955    0.02032        4        320:
38%|###7      | 15/40 [00:02<00:04,  5.40it/s]
    424/499     0.206G    0.02338   0.009559    0.02009        2        320:
38%|###7      | 15/40 [00:02<00:04,  5.40it/s]
    424/499     0.206G    0.02338   0.009559    0.02009        2        320:
40%|####      | 16/40 [00:02<00:04,  5.49it/s]
    424/499     0.206G    0.02321   0.009614    0.01979        2        320:
40%|####      | 16/40 [00:03<00:04,  5.49it/s]
```

```
    424/499      0.206G     0.02321    0.009614      0.01979          2          320:
42%|####2      | 17/40 [00:03<00:04,  5.59it/s]
    424/499      0.206G     0.02273    0.009278       0.0196          1          320:
42%|####2      | 17/40 [00:03<00:04,  5.59it/s]
    424/499      0.206G     0.02273    0.009278       0.0196          1          320:
45%|####5      | 18/40 [00:03<00:03,  5.65it/s]
    424/499      0.206G     0.02285    0.009429      0.01952          2          320:
45%|####5      | 18/40 [00:03<00:03,  5.65it/s]
    424/499      0.206G     0.02285    0.009429      0.01952          2          320:
48%|####7      | 19/40 [00:03<00:03,  5.54it/s]
    424/499      0.206G     0.02256    0.009171      0.01942          1          320:
48%|####7      | 19/40 [00:03<00:03,  5.54it/s]
    424/499      0.206G     0.02256    0.009171      0.01942          1          320:
50%|#####      | 20/40 [00:03<00:03,  5.62it/s]
    424/499      0.206G     0.02183    0.008875      0.01898          1          320:
50%|#####      | 20/40 [00:03<00:03,  5.62it/s]
    424/499      0.206G     0.02183    0.008875      0.01898          1          320:
52%|#####2     | 21/40 [00:03<00:03,  5.84it/s]
    424/499      0.206G     0.02209     0.00913      0.01937          4          320:
52%|#####2     | 21/40 [00:03<00:03,  5.84it/s]
    424/499      0.206G     0.02209     0.00913      0.01937          4          320:
55%|#####5     | 22/40 [00:03<00:03,  5.67it/s]
    424/499      0.206G     0.02183     0.00928      0.01935          2          320:
55%|#####5     | 22/40 [00:04<00:03,  5.67it/s]
    424/499      0.206G     0.02183     0.00928      0.01935          2          320:
57%|#####7     | 23/40 [00:04<00:02,  5.71it/s]
    424/499      0.206G     0.02197    0.009671      0.01968          4          320:
57%|#####7     | 23/40 [00:04<00:02,  5.71it/s]
    424/499      0.206G     0.02197    0.009671      0.01968          4          320:
60%|######     | 24/40 [00:04<00:03,  5.31it/s]
    424/499      0.206G     0.02144    0.009614      0.01951          2          320:
60%|######     | 24/40 [00:04<00:03,  5.31it/s]
    424/499      0.206G     0.02144    0.009614      0.01951          2          320:
62%|######2    | 25/40 [00:04<00:02,  5.44it/s]
    424/499      0.206G     0.02121    0.009573       0.0193          2          320:
62%|######2    | 25/40 [00:04<00:02,  5.44it/s]
    424/499      0.206G     0.02121    0.009573       0.0193          2          320:
65%|######5    | 26/40 [00:04<00:02,  5.55it/s]
    424/499      0.206G     0.02132    0.009955      0.01925          4          320:
65%|######5    | 26/40 [00:04<00:02,  5.55it/s]
    424/499      0.206G     0.02132    0.009955      0.01925          4          320:
68%|######7    | 27/40 [00:04<00:02,  5.48it/s]
    424/499      0.206G     0.02117     0.01005      0.01947          4          320:
68%|######7    | 27/40 [00:05<00:02,  5.48it/s]
    424/499      0.206G     0.02117     0.01005      0.01947          4          320:
70%|#######    | 28/40 [00:05<00:02,  5.03it/s]
    424/499      0.206G     0.02059    0.009783      0.01931          1          320:
70%|#######    | 28/40 [00:05<00:02,  5.03it/s]
```

```
      424/499      0.206G      0.02059     0.009783     0.01931          1          320:
72%|#######2  | 29/40 [00:05<00:02,  5.25it/s]
      424/499      0.206G      0.02024     0.009624      0.0191          1          320:
72%|#######2  | 29/40 [00:05<00:02,  5.25it/s]
      424/499      0.206G      0.02024     0.009624      0.0191          1          320:
75%|#######5  | 30/40 [00:05<00:01,  5.23it/s]
      424/499      0.206G      0.01987     0.009415     0.01906          1          320:
75%|#######5  | 30/40 [00:05<00:01,  5.23it/s]
      424/499      0.206G      0.01987     0.009415     0.01906          1          320:
78%|#######7  | 31/40 [00:05<00:01,  5.13it/s]
      424/499      0.206G      0.02011     0.009617      0.0191          4          320:
78%|#######7  | 31/40 [00:05<00:01,  5.13it/s]
      424/499      0.206G      0.02011     0.009617      0.0191          4          320:
80%|########  | 32/40 [00:05<00:01,  5.07it/s]
      424/499      0.206G      0.01993     0.009442     0.01901          1          320:
80%|########  | 32/40 [00:06<00:01,  5.07it/s]
      424/499      0.206G      0.01993     0.009442     0.01901          1          320:
82%|########2 | 33/40 [00:06<00:01,  4.92it/s]
      424/499      0.206G      0.02002     0.009352     0.01905          2          320:
82%|########2 | 33/40 [00:06<00:01,  4.92it/s]
      424/499      0.206G      0.02002     0.009352     0.01905          2          320:
85%|########5 | 34/40 [00:06<00:01,  4.92it/s]
      424/499      0.206G      0.01986     0.009365     0.01906          2          320:
85%|########5 | 34/40 [00:06<00:01,  4.92it/s]
      424/499      0.206G      0.01986     0.009365     0.01906          2          320:
88%|########7 | 35/40 [00:06<00:01,  4.85it/s]
      424/499      0.206G      0.01959     0.009176     0.01885          1          320:
88%|########7 | 35/40 [00:06<00:01,  4.85it/s]
      424/499      0.206G      0.01959     0.009176     0.01885          1          320:
90%|######### | 36/40 [00:06<00:00,  4.82it/s]
      424/499      0.206G       0.0202      0.00909     0.01878          2          320:
90%|######### | 36/40 [00:06<00:00,  4.82it/s]
      424/499      0.206G       0.0202      0.00909     0.01878          2          320:
92%|#########2| 37/40 [00:06<00:00,  4.74it/s]
      424/499      0.206G      0.01998     0.009004     0.01871          2          320:
92%|#########2| 37/40 [00:07<00:00,  4.74it/s]
      424/499      0.206G      0.01998     0.009004     0.01871          2          320:
95%|#########5| 38/40 [00:07<00:00,  4.89it/s]
      424/499      0.206G      0.02015     0.008974     0.01875          2          320:
95%|#########5| 38/40 [00:07<00:00,  4.89it/s]
      424/499      0.206G      0.02015     0.008974     0.01875          2          320:
98%|#########7| 39/40 [00:07<00:00,  4.79it/s]
      424/499      0.206G      0.01984     0.008834     0.01877          1          320:
98%|#########7| 39/40 [00:07<00:00,  4.79it/s]
      424/499      0.206G      0.01984     0.008834     0.01877          1          320:
100%|##########| 40/40 [00:07<00:00,  4.92it/s]
      424/499      0.206G      0.01984     0.008834     0.01877          1          320:
100%|##########| 40/40 [00:07<00:00,  5.29it/s]
```

```
              Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:01, 14.38it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:01, 15.29it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 14.78it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 14.47it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 14.98it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 15.31it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 16.17it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:01<00:00, 15.34it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 16.74it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.56it/s]
                all         40         40       0.98      0.983      0.995
0.777

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|              | 0/40 [00:00<?, ?it/s]
    425/499     0.206G    0.04474    0.00648    0.01632          2        320:
0%|          | 0/40 [00:00<?, ?it/s]
    425/499     0.206G    0.04474    0.00648    0.01632          2        320:
2%|2         | 1/40 [00:00<00:07,  5.32it/s]
    425/499     0.206G    0.03167    0.01005    0.01822          4        320:
2%|2         | 1/40 [00:00<00:07,  5.32it/s]
    425/499     0.206G    0.03167    0.01005    0.01822          4        320:
5%|5         | 2/40 [00:00<00:07,  5.33it/s]
    425/499     0.206G    0.03632    0.01033    0.02057          4        320:
5%|5         | 2/40 [00:00<00:07,  5.33it/s]
    425/499     0.206G    0.03632    0.01033    0.02057          4        320:
8%|7         | 3/40 [00:00<00:06,  5.53it/s]
    425/499     0.206G     0.0354    0.01224    0.02223          4        320:
8%|7         | 3/40 [00:00<00:06,  5.53it/s]
    425/499     0.206G     0.0354    0.01224    0.02223          4        320:
10%|#         | 4/40 [00:00<00:06,  5.27it/s]
    425/499     0.206G    0.03662    0.01105    0.02868          2        320:
10%|#         | 4/40 [00:00<00:06,  5.27it/s]
    425/499     0.206G    0.03662    0.01105    0.02868          2        320:
```

```
12%|#2         | 5/40 [00:00<00:06,  5.45it/s]
    425/499    0.206G    0.03557    0.01115    0.02626        2      320:
12%|#2         | 5/40 [00:01<00:06,  5.45it/s]
    425/499    0.206G    0.03557    0.01115    0.02626        2      320:
15%|#5         | 6/40 [00:01<00:06,  5.40it/s]
    425/499    0.206G    0.03293    0.0117     0.0251         4      320:
15%|#5         | 6/40 [00:01<00:06,  5.40it/s]
    425/499    0.206G    0.03293    0.0117     0.0251         4      320:
18%|#7         | 7/40 [00:01<00:06,  5.10it/s]
    425/499    0.206G    0.03375    0.01139    0.02453        4      320:
18%|#7         | 7/40 [00:01<00:06,  5.10it/s]
    425/499    0.206G    0.03375    0.01139    0.02453        4      320:
20%|##         | 8/40 [00:01<00:06,  5.30it/s]
    425/499    0.206G    0.03143    0.01048    0.02381        1      320:
20%|##         | 8/40 [00:01<00:06,  5.30it/s]
    425/499    0.206G    0.03143    0.01048    0.02381        1      320:
22%|##2        | 9/40 [00:01<00:05,  5.29it/s]
    425/499    0.206G    0.02936    0.009778   0.02302        1      320:
22%|##2        | 9/40 [00:01<00:05,  5.29it/s]
    425/499    0.206G    0.02936    0.009778   0.02302        1      320:
25%|##5        | 10/40 [00:01<00:05,  5.59it/s]
    425/499    0.206G    0.02804    0.009321   0.0226         1      320:
25%|##5        | 10/40 [00:02<00:05,  5.59it/s]
    425/499    0.206G    0.02804    0.009321   0.0226         1      320:
28%|##7        | 11/40 [00:02<00:05,  5.51it/s]
    425/499    0.206G    0.02678    0.0092     0.0218         1      320:
28%|##7        | 11/40 [00:02<00:05,  5.51it/s]
    425/499    0.206G    0.02678    0.0092     0.0218         1      320:
30%|###        | 12/40 [00:02<00:05,  5.58it/s]
    425/499    0.206G    0.02545    0.009052   0.02156        2      320:
30%|###        | 12/40 [00:02<00:05,  5.58it/s]
    425/499    0.206G    0.02545    0.009052   0.02156        2      320:
32%|###2       | 13/40 [00:02<00:04,  5.65it/s]
    425/499    0.206G    0.02528    0.009642   0.02189        4      320:
32%|###2       | 13/40 [00:02<00:04,  5.65it/s]
    425/499    0.206G    0.02528    0.009642   0.02189        4      320:
35%|###5       | 14/40 [00:02<00:04,  5.70it/s]
    425/499    0.206G    0.02469    0.009319   0.02155        2      320:
35%|###5       | 14/40 [00:02<00:04,  5.70it/s]
    425/499    0.206G    0.02469    0.009319   0.02155        2      320:
38%|###7       | 15/40 [00:02<00:04,  5.73it/s]
    425/499    0.206G    0.02369    0.008956   0.02114        1      320:
38%|###7       | 15/40 [00:02<00:04,  5.73it/s]
    425/499    0.206G    0.02369    0.008956   0.02114        1      320:
40%|####       | 16/40 [00:02<00:04,  5.76it/s]
    425/499    0.206G    0.02361    0.009051   0.02083        1      320:
40%|####       | 16/40 [00:03<00:04,  5.76it/s]
    425/499    0.206G    0.02361    0.009051   0.02083        1      320:
```

```
42%|####2        | 17/40 [00:03<00:04,  5.62it/s]
    425/499      0.206G    0.02463   0.009653    0.02122        4        320:
42%|####2        | 17/40 [00:03<00:04,  5.62it/s]
    425/499      0.206G    0.02463   0.009653    0.02122        4        320:
45%|####5        | 18/40 [00:03<00:03,  5.66it/s]
    425/499      0.206G    0.02411   0.009849    0.02118        4        320:
45%|####5        | 18/40 [00:03<00:03,  5.66it/s]
    425/499      0.206G    0.02411   0.009849    0.02118        4        320:
48%|####7        | 19/40 [00:03<00:03,  5.56it/s]
    425/499      0.206G    0.02377   0.009965    0.02171        4        320:
48%|####7        | 19/40 [00:03<00:03,  5.56it/s]
    425/499      0.206G    0.02377   0.009965    0.02171        4        320:
50%|#####        | 20/40 [00:03<00:03,  5.63it/s]
    425/499      0.206G    0.02376   0.01034     0.02153        4        320:
50%|#####        | 20/40 [00:03<00:03,  5.63it/s]
    425/499      0.206G    0.02376   0.01034     0.02153        4        320:
52%|#####2       | 21/40 [00:03<00:03,  5.52it/s]
    425/499      0.206G    0.02322   0.01001     0.02144        1        320:
52%|#####2       | 21/40 [00:03<00:03,  5.52it/s]
    425/499      0.206G    0.02322   0.01001     0.02144        1        320:
55%|#####5       | 22/40 [00:03<00:03,  5.61it/s]
    425/499      0.206G    0.02295   0.009891    0.02202        2        320:
55%|#####5       | 22/40 [00:04<00:03,  5.61it/s]
    425/499      0.206G    0.02295   0.009891    0.02202        2        320:
57%|#####7       | 23/40 [00:04<00:02,  5.67it/s]
    425/499      0.206G    0.02391   0.009935    0.02191        4        320:
57%|#####7       | 23/40 [00:04<00:02,  5.67it/s]
    425/499      0.206G    0.02391   0.009935    0.02191        4        320:
60%|######       | 24/40 [00:04<00:02,  5.53it/s]
    425/499      0.206G    0.0234    0.009658    0.02157        1        320:
60%|######       | 24/40 [00:04<00:02,  5.53it/s]
    425/499      0.206G    0.0234    0.009658    0.02157        1        320:
62%|######2      | 25/40 [00:04<00:02,  5.61it/s]
    425/499      0.206G    0.02304   0.009655    0.02128        2        320:
62%|######2      | 25/40 [00:04<00:02,  5.61it/s]
    425/499      0.206G    0.02304   0.009655    0.02128        2        320:
65%|######5      | 26/40 [00:04<00:02,  5.68it/s]
    425/499      0.206G    0.02254   0.009433    0.02139        1        320:
65%|######5      | 26/40 [00:04<00:02,  5.68it/s]
    425/499      0.206G    0.02254   0.009433    0.02139        1        320:
68%|######7      | 27/40 [00:04<00:02,  5.73it/s]
    425/499      0.206G    0.02226   0.009234    0.02127        1        320:
68%|######7      | 27/40 [00:05<00:02,  5.73it/s]
    425/499      0.206G    0.02226   0.009234    0.02127        1        320:
70%|#######      | 28/40 [00:05<00:02,  5.32it/s]
    425/499      0.206G    0.0231    0.009137    0.02137        2        320:
70%|#######      | 28/40 [00:05<00:02,  5.32it/s]
    425/499      0.206G    0.0231    0.009137    0.02137        2        320:
```

```
72%|#######2  | 29/40 [00:05<00:02,  5.37it/s]
     425/499      0.206G    0.02424   0.009024    0.02125           2         320:
72%|#######2  | 29/40 [00:05<00:02,  5.37it/s]
     425/499      0.206G    0.02424   0.009024    0.02125           2         320:
75%|#######5  | 30/40 [00:05<00:01,  5.42it/s]
     425/499      0.206G    0.02382   0.008878    0.02107           1         320:
75%|#######5  | 30/40 [00:05<00:01,  5.42it/s]
     425/499      0.206G    0.02382   0.008878    0.02107           1         320:
78%|#######7  | 31/40 [00:05<00:01,  5.53it/s]
     425/499      0.206G    0.02397   0.009139    0.02111           4         320:
78%|#######7  | 31/40 [00:05<00:01,  5.53it/s]
     425/499      0.206G    0.02397   0.009139    0.02111           4         320:
80%|########  | 32/40 [00:05<00:01,  5.33it/s]
     425/499      0.206G    0.02361    0.00925    0.02095           4         320:
80%|########  | 32/40 [00:06<00:01,  5.33it/s]
     425/499      0.206G    0.02361    0.00925    0.02095           4         320:
82%|########2 | 33/40 [00:06<00:01,  5.33it/s]
     425/499      0.206G    0.02327   0.009086    0.02096           1         320:
82%|########2 | 33/40 [00:06<00:01,  5.33it/s]
     425/499      0.206G    0.02327   0.009086    0.02096           1         320:
85%|########5 | 34/40 [00:06<00:01,  5.47it/s]
     425/499      0.206G    0.02281   0.008896    0.02074           1         320:
85%|########5 | 34/40 [00:06<00:01,  5.47it/s]
     425/499      0.206G    0.02281   0.008896    0.02074           1         320:
88%|########7 | 35/40 [00:06<00:00,  5.55it/s]
     425/499      0.206G     0.0233   0.009106    0.02089           4         320:
88%|########7 | 35/40 [00:06<00:00,  5.55it/s]
     425/499      0.206G     0.0233   0.009106    0.02089           4         320:
90%|######### | 36/40 [00:06<00:00,  5.34it/s]
     425/499      0.206G     0.0235    0.00902    0.02111           2         320:
90%|######### | 36/40 [00:06<00:00,  5.34it/s]
     425/499      0.206G     0.0235    0.00902    0.02111           2         320:
92%|#########2| 37/40 [00:06<00:00,  5.34it/s]
     425/499      0.206G    0.02335    0.00888    0.02098           1         320:
92%|#########2| 37/40 [00:06<00:00,  5.34it/s]
     425/499      0.206G    0.02335    0.00888    0.02098           1         320:
95%|#########5| 38/40 [00:06<00:00,  5.32it/s]
     425/499      0.206G    0.02328   0.008942    0.02103           3         320:
95%|#########5| 38/40 [00:07<00:00,  5.32it/s]
     425/499      0.206G    0.02328   0.008942    0.02103           3         320:
98%|#########7| 39/40 [00:07<00:00,  5.33it/s]
     425/499      0.206G    0.02318   0.009053    0.02097           4         320:
98%|#########7| 39/40 [00:07<00:00,  5.33it/s]
     425/499      0.206G    0.02318   0.009053    0.02097           4         320:
100%|##########| 40/40 [00:07<00:00,  5.33it/s]
     425/499      0.206G    0.02318   0.009053    0.02097           4         320:
100%|##########| 40/40 [00:07<00:00,  5.48it/s]
```

```
               Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 17.74it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 18.05it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 18.16it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 16.37it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 15.89it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 17.00it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 17.40it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 17.67it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.86it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.83it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.77it/s]
                 all          40         40      0.977          1      0.995
0.796

       Epoch     GPU_mem    box_loss    obj_loss    cls_loss   Instances        Size

  0%|            | 0/40 [00:00<?, ?it/s]
     426/499      0.206G      0.0236     0.01133     0.02055           4        320:
0%|            | 0/40 [00:00<?, ?it/s]
     426/499      0.206G      0.0236     0.01133     0.02055           4        320:
2%|2          | 1/40 [00:00<00:06,  5.77it/s]
     426/499      0.206G     0.02554    0.008097     0.02695           2        320:
2%|2          | 1/40 [00:00<00:06,  5.77it/s]
     426/499      0.206G     0.02554    0.008097     0.02695           2        320:
5%|5          | 2/40 [00:00<00:06,  5.51it/s]
     426/499      0.206G     0.02577     0.01096     0.02549           4        320:
5%|5          | 2/40 [00:00<00:06,  5.51it/s]
     426/499      0.206G     0.02577     0.01096     0.02549           4        320:
8%|7          | 3/40 [00:00<00:06,  5.43it/s]
     426/499      0.206G     0.02862     0.01068     0.02308           2        320:
8%|7          | 3/40 [00:00<00:06,  5.43it/s]
     426/499      0.206G     0.02862     0.01068     0.02308           2        320:
10%|#          | 4/40 [00:00<00:06,  5.54it/s]
     426/499      0.206G     0.02437    0.009619     0.02209           1        320:
10%|#          | 4/40 [00:00<00:06,  5.54it/s]
```

```
    426/499      0.206G      0.02437    0.009619      0.02209          1        320:
12%|#2         | 5/40 [00:00<00:06,  5.64it/s]
    426/499      0.206G      0.02243    0.008511      0.02139          1        320:
12%|#2         | 5/40 [00:01<00:06,  5.64it/s]
    426/499      0.206G      0.02243    0.008511      0.02139          1        320:
15%|#5         | 6/40 [00:01<00:05,  5.70it/s]
    426/499      0.206G       0.0245    0.009646      0.02131          4        320:
15%|#5         | 6/40 [00:01<00:05,  5.70it/s]
    426/499      0.206G       0.0245    0.009646      0.02131          4        320:
18%|#7         | 7/40 [00:01<00:05,  5.56it/s]
    426/499      0.206G      0.02384    0.009792      0.02083          3        320:
18%|#7         | 7/40 [00:01<00:05,  5.56it/s]
    426/499      0.206G      0.02384    0.009792      0.02083          3        320:
20%|##         | 8/40 [00:01<00:05,  5.64it/s]
    426/499      0.206G      0.02208    0.009185      0.02029          1        320:
20%|##         | 8/40 [00:01<00:05,  5.64it/s]
    426/499      0.206G      0.02208    0.009185      0.02029          1        320:
22%|##2        | 9/40 [00:01<00:05,  5.69it/s]
    426/499      0.206G      0.02184     0.01011      0.02018          4        320:
22%|##2        | 9/40 [00:01<00:05,  5.69it/s]
    426/499      0.206G      0.02184     0.01011      0.02018          4        320:
25%|##5        | 10/40 [00:01<00:05,  5.72it/s]
    426/499      0.206G      0.02264    0.009824      0.02004          1        320:
25%|##5        | 10/40 [00:01<00:05,  5.72it/s]
    426/499      0.206G      0.02264    0.009824      0.02004          1        320:
28%|##7        | 11/40 [00:01<00:05,  5.75it/s]
    426/499      0.206G      0.02487    0.009528      0.01982          2        320:
28%|##7        | 11/40 [00:02<00:05,  5.75it/s]
    426/499      0.206G      0.02487    0.009528      0.01982          2        320:
30%|###        | 12/40 [00:02<00:04,  5.77it/s]
    426/499      0.206G      0.02377    0.009398      0.01927          2        320:
30%|###        | 12/40 [00:02<00:04,  5.77it/s]
    426/499      0.206G      0.02377    0.009398      0.01927          2        320:
32%|###2       | 13/40 [00:02<00:04,  5.61it/s]
    426/499      0.206G      0.02256    0.008949      0.01871          1        320:
32%|###2       | 13/40 [00:02<00:04,  5.61it/s]
    426/499      0.206G      0.02256    0.008949      0.01871          1        320:
35%|###5       | 14/40 [00:02<00:04,  5.66it/s]
    426/499      0.206G      0.02221    0.009322      0.01907          4        320:
35%|###5       | 14/40 [00:02<00:04,  5.66it/s]
    426/499      0.206G      0.02221    0.009322      0.01907          4        320:
38%|###7       | 15/40 [00:02<00:04,  5.71it/s]
    426/499      0.206G      0.02259     0.00961      0.01928          4        320:
38%|###7       | 15/40 [00:02<00:04,  5.71it/s]
    426/499      0.206G      0.02259     0.00961      0.01928          4        320:
40%|####       | 16/40 [00:02<00:04,  5.57it/s]
    426/499      0.206G      0.02199    0.009508      0.01892          2        320:
40%|####       | 16/40 [00:03<00:04,  5.57it/s]
```

```
      426/499       0.206G      0.02199    0.009508      0.01892          2          320:
42%|####2      | 17/40 [00:03<00:04,  5.50it/s]
      426/499       0.206G      0.02143     0.00924       0.0189          2          320:
42%|####2      | 17/40 [00:03<00:04,  5.50it/s]
      426/499       0.206G      0.02143     0.00924       0.0189          2          320:
45%|####5      | 18/40 [00:03<00:04,  5.27it/s]
      426/499       0.206G      0.02163    0.009486      0.01884          4          320:
45%|####5      | 18/40 [00:03<00:04,  5.27it/s]
      426/499       0.206G      0.02163    0.009486      0.01884          4          320:
48%|####7      | 19/40 [00:03<00:04,  5.17it/s]
      426/499       0.206G      0.02138    0.009389      0.01873          2          320:
48%|####7      | 19/40 [00:03<00:04,  5.17it/s]
      426/499       0.206G      0.02138    0.009389      0.01873          2          320:
50%|#####      | 20/40 [00:03<00:03,  5.22it/s]
      426/499       0.206G      0.02095    0.009207      0.01881          2          320:
50%|#####      | 20/40 [00:03<00:03,  5.22it/s]
      426/499       0.206G      0.02095    0.009207      0.01881          2          320:
52%|#####2     | 21/40 [00:03<00:03,  5.26it/s]
      426/499       0.206G      0.02064     0.00905      0.01872          2          320:
52%|#####2     | 21/40 [00:04<00:03,  5.26it/s]
      426/499       0.206G      0.02064     0.00905      0.01872          2          320:
55%|#####5     | 22/40 [00:04<00:03,  5.15it/s]
      426/499       0.206G      0.02027    0.008877      0.01862          2          320:
55%|#####5     | 22/40 [00:04<00:03,  5.15it/s]
      426/499       0.206G      0.02027    0.008877      0.01862          2          320:
57%|#####7     | 23/40 [00:04<00:03,  5.20it/s]
      426/499       0.206G      0.02196    0.009163      0.01861          3          320:
57%|#####7     | 23/40 [00:04<00:03,  5.20it/s]
      426/499       0.206G      0.02196    0.009163      0.01861          3          320:
60%|######     | 24/40 [00:04<00:03,  4.99it/s]
      426/499       0.206G      0.02237     0.00953      0.01888          4          320:
60%|######     | 24/40 [00:04<00:03,  4.99it/s]
      426/499       0.206G      0.02237     0.00953      0.01888          4          320:
62%|######2    | 25/40 [00:04<00:03,  4.75it/s]
      426/499       0.206G      0.02218    0.009646      0.01926          4          320:
62%|######2    | 25/40 [00:04<00:03,  4.75it/s]
      426/499       0.206G      0.02218    0.009646      0.01926          4          320:
65%|######5    | 26/40 [00:04<00:02,  4.80it/s]
      426/499       0.206G      0.02264    0.009532      0.01913          2          320:
65%|######5    | 26/40 [00:05<00:02,  4.80it/s]
      426/499       0.206G      0.02264    0.009532      0.01913          2          320:
68%|######7    | 27/40 [00:05<00:02,  4.81it/s]
      426/499       0.206G      0.02216     0.00943      0.01925          2          320:
68%|######7    | 27/40 [00:05<00:02,  4.81it/s]
      426/499       0.206G      0.02216     0.00943      0.01925          2          320:
70%|#######    | 28/40 [00:05<00:02,  4.84it/s]
      426/499       0.206G      0.02171    0.009338      0.01904          2          320:
70%|#######    | 28/40 [00:05<00:02,  4.84it/s]
```

44

```
    426/499      0.206G    0.02171    0.009338     0.01904          2          320:
72%|#######2 | 29/40 [00:05<00:02,  4.97it/s]
    426/499      0.206G    0.02193    0.009527     0.01913          4          320:
72%|#######2 | 29/40 [00:05<00:02,  4.97it/s]
    426/499      0.206G    0.02193    0.009527     0.01913          4          320:
75%|#######5 | 30/40 [00:05<00:02,  4.73it/s]
    426/499      0.206G    0.02202    0.009694     0.01924          4          320:
75%|#######5 | 30/40 [00:05<00:02,  4.73it/s]
    426/499      0.206G    0.02202    0.009694     0.01924          4          320:
78%|#######7 | 31/40 [00:05<00:01,  4.79it/s]
    426/499      0.206G    0.02177    0.009777     0.01946          4          320:
78%|#######7 | 31/40 [00:06<00:01,  4.79it/s]
    426/499      0.206G    0.02177    0.009777     0.01946          4          320:
80%|######## | 32/40 [00:06<00:01,  4.93it/s]
    426/499      0.206G    0.02256    0.009679     0.01947          2          320:
80%|######## | 32/40 [00:06<00:01,  4.93it/s]
    426/499      0.206G    0.02256    0.009679     0.01947          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.05it/s]
    426/499      0.206G    0.02261    0.009872     0.01974          4          320:
82%|########2 | 33/40 [00:06<00:01,  5.05it/s]
    426/499      0.206G    0.02261    0.009872     0.01974          4          320:
85%|########5 | 34/40 [00:06<00:01,  4.99it/s]
    426/499      0.206G    0.02243    0.009704     0.01963          1          320:
85%|########5 | 34/40 [00:06<00:01,  4.99it/s]
    426/499      0.206G    0.02243    0.009704     0.01963          1          320:
88%|########7 | 35/40 [00:06<00:00,  5.34it/s]
    426/499      0.206G    0.02201    0.009607      0.0196          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.34it/s]
    426/499      0.206G    0.02201    0.009607      0.0196          2          320:
90%|######### | 36/40 [00:06<00:00,  5.47it/s]
    426/499      0.206G    0.02168    0.009542     0.01947          2          320:
90%|######### | 36/40 [00:06<00:00,  5.47it/s]
    426/499      0.206G    0.02168    0.009542     0.01947          2          320:
92%|#########2| 37/40 [00:06<00:00,  5.57it/s]
    426/499      0.206G    0.02126    0.009397     0.01924          1          320:
92%|#########2| 37/40 [00:07<00:00,  5.57it/s]
    426/499      0.206G    0.02126    0.009397     0.01924          1          320:
95%|#########5| 38/40 [00:07<00:00,  5.64it/s]
    426/499      0.206G    0.02108    0.009291      0.0193          2          320:
95%|#########5| 38/40 [00:07<00:00,  5.64it/s]
    426/499      0.206G    0.02108    0.009291      0.0193          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.40it/s]
    426/499      0.206G    0.02107    0.009457     0.01927          4          320:
98%|#########7| 39/40 [00:07<00:00,  5.40it/s]
    426/499      0.206G    0.02107    0.009457     0.01927          4          320:
100%|##########| 40/40 [00:07<00:00,  5.30it/s]
    426/499      0.206G    0.02107    0.009457     0.01927          4          320:
100%|##########| 40/40 [00:07<00:00,  5.30it/s]
```

```
              Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:00, 19.45it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 17.25it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 17.71it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 17.92it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 17.87it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  65%|######5    | 13/20 [00:00<00:00, 18.43it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5   | 15/20 [00:00<00:00, 18.39it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  85%|########5  | 17/20 [00:00<00:00, 18.36it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5 | 19/20 [00:01<00:00, 18.17it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 18.34it/s]
                all         40         40      0.977          1      0.995
0.796

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
     427/499     0.206G    0.05882   0.005266    0.01607          2        320:
0%|          | 0/40 [00:00<?, ?it/s]
     427/499     0.206G    0.05882   0.005266    0.01607          2        320:
2%|2         | 1/40 [00:00<00:06,  5.78it/s]
     427/499     0.206G     0.0411   0.007647    0.02218          3        320:
2%|2         | 1/40 [00:00<00:06,  5.78it/s]
     427/499     0.206G     0.0411   0.007647    0.02218          3        320:
5%|5         | 2/40 [00:00<00:06,  5.48it/s]
     427/499     0.206G    0.03205   0.006792    0.02015          2        320:
5%|5         | 2/40 [00:00<00:06,  5.48it/s]
     427/499     0.206G    0.03205   0.006792    0.02015          2        320:
8%|7         | 3/40 [00:00<00:06,  5.87it/s]
     427/499     0.206G    0.03293    0.00657      0.019          2        320:
8%|7         | 3/40 [00:00<00:06,  5.87it/s]
     427/499     0.206G    0.03293    0.00657      0.019          2        320:
10%|#         | 4/40 [00:00<00:06,  5.66it/s]
     427/499     0.206G    0.03393   0.007358    0.02107          3        320:
10%|#         | 4/40 [00:00<00:06,  5.66it/s]
     427/499     0.206G    0.03393   0.007358    0.02107          3        320:
```

```
12%|#2        | 5/40 [00:00<00:06,  5.64it/s]
    427/499    0.206G    0.03053    0.006693    0.01984          1         320:
12%|#2        | 5/40 [00:01<00:06,  5.64it/s]
    427/499    0.206G    0.03053    0.006693    0.01984          1         320:
15%|#5        | 6/40 [00:01<00:06,  5.58it/s]
    427/499    0.206G     0.0292    0.006861    0.01939          2         320:
15%|#5        | 6/40 [00:01<00:06,  5.58it/s]
    427/499    0.206G     0.0292    0.006861    0.01939          2         320:
18%|#7        | 7/40 [00:01<00:06,  5.47it/s]
    427/499    0.206G    0.02876    0.007479    0.02052          4         320:
18%|#7        | 7/40 [00:01<00:06,  5.47it/s]
    427/499    0.206G    0.02876    0.007479    0.02052          4         320:
20%|##        | 8/40 [00:01<00:05,  5.43it/s]
    427/499    0.206G    0.03006    0.007959    0.02015          3         320:
20%|##        | 8/40 [00:01<00:05,  5.43it/s]
    427/499    0.206G    0.03006    0.007959    0.02015          3         320:
22%|##2       | 9/40 [00:01<00:05,  5.40it/s]
    427/499    0.206G     0.0282    0.007484    0.01957          1         320:
22%|##2       | 9/40 [00:01<00:05,  5.40it/s]
    427/499    0.206G     0.0282    0.007484    0.01957          1         320:
25%|##5       | 10/40 [00:01<00:05,  5.50it/s]
    427/499    0.206G    0.02721    0.007687    0.02081          2         320:
25%|##5       | 10/40 [00:01<00:05,  5.50it/s]
    427/499    0.206G    0.02721    0.007687    0.02081          2         320:
28%|##7       | 11/40 [00:01<00:05,  5.60it/s]
    427/499    0.206G    0.02675    0.008437    0.02079          4         320:
28%|##7       | 11/40 [00:02<00:05,  5.60it/s]
    427/499    0.206G    0.02675    0.008437    0.02079          4         320:
30%|###       | 12/40 [00:02<00:05,  5.24it/s]
    427/499    0.206G    0.02717    0.008949    0.02076          4         320:
30%|###       | 12/40 [00:02<00:05,  5.24it/s]
    427/499    0.206G    0.02717    0.008949    0.02076          4         320:
32%|###2      | 13/40 [00:02<00:05,  5.38it/s]
    427/499    0.206G    0.02696    0.009806    0.02074          4         320:
32%|###2      | 13/40 [00:02<00:05,  5.38it/s]
    427/499    0.206G    0.02696    0.009806    0.02074          4         320:
35%|###5      | 14/40 [00:02<00:04,  5.37it/s]
    427/499    0.206G    0.02665    0.009512     0.0203          2         320:
35%|###5      | 14/40 [00:02<00:04,  5.37it/s]
    427/499    0.206G    0.02665    0.009512     0.0203          2         320:
38%|###7      | 15/40 [00:02<00:04,  5.50it/s]
    427/499    0.206G    0.02592    0.009311    0.02028          2         320:
38%|###7      | 15/40 [00:02<00:04,  5.50it/s]
    427/499    0.206G    0.02592    0.009311    0.02028          2         320:
40%|####      | 16/40 [00:02<00:04,  5.43it/s]
    427/499    0.206G    0.02512    0.009259    0.02033          2         320:
40%|####      | 16/40 [00:03<00:04,  5.43it/s]
    427/499    0.206G    0.02512    0.009259    0.02033          2         320:
```

```
42%|####2      | 17/40 [00:03<00:04,  5.54it/s]
    427/499     0.206G    0.02427   0.009069    0.02023        2        320:
42%|####2      | 17/40 [00:03<00:04,  5.54it/s]
    427/499     0.206G    0.02427   0.009069    0.02023        2        320:
45%|####5      | 18/40 [00:03<00:03,  5.62it/s]
    427/499     0.206G    0.02416   0.009351    0.02012        4        320:
45%|####5      | 18/40 [00:03<00:03,  5.62it/s]
    427/499     0.206G    0.02416   0.009351    0.02012        4        320:
48%|####7      | 19/40 [00:03<00:03,  5.67it/s]
    427/499     0.206G    0.02336   0.009374    0.01993        4        320:
48%|####7      | 19/40 [00:03<00:03,  5.67it/s]
    427/499     0.206G    0.02336   0.009374    0.01993        4        320:
50%|#####      | 20/40 [00:03<00:03,  5.57it/s]
    427/499     0.206G    0.02384   0.009239    0.01989        2        320:
50%|#####      | 20/40 [00:03<00:03,  5.57it/s]
    427/499     0.206G    0.02384   0.009239    0.01989        2        320:
52%|#####2     | 21/40 [00:03<00:03,  5.49it/s]
    427/499     0.206G    0.02337   0.009017    0.01968        1        320:
52%|#####2     | 21/40 [00:04<00:03,  5.49it/s]
    427/499     0.206G    0.02337   0.009017    0.01968        1        320:
55%|#####5     | 22/40 [00:04<00:03,  5.39it/s]
    427/499     0.206G    0.02294   0.008927    0.01972        2        320:
55%|#####5     | 22/40 [00:04<00:03,  5.39it/s]
    427/499     0.206G    0.02294   0.008927    0.01972        2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.51it/s]
    427/499     0.206G     0.0224   0.008835    0.01959        2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.51it/s]
    427/499     0.206G     0.0224   0.008835    0.01959        2        320:
60%|######     | 24/40 [00:04<00:02,  5.46it/s]
    427/499     0.206G    0.02182   0.008623    0.01941        1        320:
60%|######     | 24/40 [00:04<00:02,  5.46it/s]
    427/499     0.206G    0.02182   0.008623    0.01941        1        320:
62%|######2    | 25/40 [00:04<00:02,  5.57it/s]
    427/499     0.206G    0.02173   0.008818     0.0193        2        320:
62%|######2    | 25/40 [00:04<00:02,  5.57it/s]
    427/499     0.206G    0.02173   0.008818     0.0193        2        320:
65%|######5    | 26/40 [00:04<00:02,  5.64it/s]
    427/499     0.206G    0.02248   0.008975    0.01935        2        320:
65%|######5    | 26/40 [00:04<00:02,  5.64it/s]
    427/499     0.206G    0.02248   0.008975    0.01935        2        320:
68%|######7    | 27/40 [00:04<00:02,  5.55it/s]
    427/499     0.206G    0.02258   0.008854    0.01932        2        320:
68%|######7    | 27/40 [00:05<00:02,  5.55it/s]
    427/499     0.206G    0.02258   0.008854    0.01932        2        320:
70%|#######    | 28/40 [00:05<00:02,  5.33it/s]
    427/499     0.206G    0.02275   0.008783    0.01916        2        320:
70%|#######    | 28/40 [00:05<00:02,  5.33it/s]
    427/499     0.206G    0.02275   0.008783    0.01916        2        320:
```

```
72%|#######2  | 29/40 [00:05<00:02,  5.33it/s]
     427/499     0.206G    0.02312   0.009031    0.01929        4        320:
72%|#######2  | 29/40 [00:05<00:02,  5.33it/s]
     427/499     0.206G    0.02312   0.009031    0.01929        4        320:
75%|#######5  | 30/40 [00:05<00:01,  5.32it/s]
     427/499     0.206G    0.02294   0.009169     0.0197        4        320:
75%|#######5  | 30/40 [00:05<00:01,  5.32it/s]
     427/499     0.206G    0.02294   0.009169     0.0197        4        320:
78%|#######7  | 31/40 [00:05<00:01,  5.32it/s]
     427/499     0.206G    0.02275   0.009302    0.01966        4        320:
78%|#######7  | 31/40 [00:05<00:01,  5.32it/s]
     427/499     0.206G    0.02275   0.009302    0.01966        4        320:
80%|########  | 32/40 [00:05<00:01,  5.46it/s]
     427/499     0.206G    0.02257   0.009363     0.0197        4        320:
80%|########  | 32/40 [00:06<00:01,  5.46it/s]
     427/499     0.206G    0.02257   0.009363     0.0197        4        320:
82%|########2 | 33/40 [00:06<00:01,  5.42it/s]
     427/499     0.206G    0.02246   0.009296    0.01994        2        320:
82%|########2 | 33/40 [00:06<00:01,  5.42it/s]
     427/499     0.206G    0.02246   0.009296    0.01994        2        320:
85%|########5 | 34/40 [00:06<00:01,  5.53it/s]
     427/499     0.206G    0.02245   0.009167     0.0198        1        320:
85%|########5 | 34/40 [00:06<00:01,  5.53it/s]
     427/499     0.206G    0.02245   0.009167     0.0198        1        320:
88%|########7 | 35/40 [00:06<00:00,  5.47it/s]
     427/499     0.206G    0.02269   0.009166    0.01979        2        320:
88%|########7 | 35/40 [00:06<00:00,  5.47it/s]
     427/499     0.206G    0.02269   0.009166    0.01979        2        320:
90%|######### | 36/40 [00:06<00:00,  5.55it/s]
     427/499     0.206G    0.02254   0.009314    0.01978        4        320:
90%|######### | 36/40 [00:06<00:00,  5.55it/s]
     427/499     0.206G    0.02254   0.009314    0.01978        4        320:
92%|#########2| 37/40 [00:06<00:00,  5.62it/s]
     427/499     0.206G    0.02258    0.00948    0.01969        4        320:
92%|#########2| 37/40 [00:06<00:00,  5.62it/s]
     427/499     0.206G    0.02258    0.00948    0.01969        4        320:
95%|#########5| 38/40 [00:06<00:00,  5.53it/s]
     427/499     0.206G    0.02222   0.009354    0.01972        1        320:
95%|#########5| 38/40 [00:07<00:00,  5.53it/s]
     427/499     0.206G    0.02222   0.009354    0.01972        1        320:
98%|#########7| 39/40 [00:07<00:00,  5.60it/s]
     427/499     0.206G     0.0221   0.009345    0.01973        2        320:
98%|#########7| 39/40 [00:07<00:00,  5.60it/s]
     427/499     0.206G     0.0221   0.009345    0.01973        2        320:
100%|##########| 40/40 [00:07<00:00,  5.82it/s]
     427/499     0.206G     0.0221   0.009345    0.01973        2        320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]
```

```
              Class     Images  Instances         P         R     mAP50
mAP50-95:   0%|           | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  10%|#         | 2/20 [00:00<00:00, 18.28it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  20%|##        | 4/20 [00:00<00:00, 18.28it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 17.42it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  45%|####5     | 9/20 [00:00<00:00, 17.14it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  55%|#####5    | 11/20 [00:00<00:00, 16.08it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  65%|######5   | 13/20 [00:00<00:00, 16.72it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  75%|#######5  | 15/20 [00:00<00:00, 17.03it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  85%|########5 | 17/20 [00:00<00:00, 17.40it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 16.28it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.54it/s]
                all        40        40     0.992     0.997     0.995
0.801


      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    428/499     0.206G    0.01708    0.01237    0.02053          4       320:
0%|           | 0/40 [00:00<?, ?it/s]
    428/499     0.206G    0.01708    0.01237    0.02053          4       320:
2%|2         | 1/40 [00:00<00:07,  5.42it/s]
    428/499     0.206G    0.02611    0.01199    0.01781          2       320:
2%|2         | 1/40 [00:00<00:07,  5.42it/s]
    428/499     0.206G    0.02611    0.01199    0.01781          2       320:
5%|5         | 2/40 [00:00<00:06,  5.86it/s]
    428/499     0.206G    0.02087     0.0125    0.01661          4       320:
5%|5         | 2/40 [00:00<00:06,  5.86it/s]
    428/499     0.206G    0.02087     0.0125    0.01661          4       320:
8%|7         | 3/40 [00:00<00:06,  5.84it/s]
    428/499     0.206G    0.01886    0.01063     0.0166          1       320:
8%|7         | 3/40 [00:00<00:06,  5.84it/s]
    428/499     0.206G    0.01886    0.01063     0.0166          1       320:
10%|#         | 4/40 [00:00<00:06,  5.80it/s]
    428/499     0.206G    0.01856   0.009584    0.01604          1       320:
10%|#         | 4/40 [00:00<00:06,  5.80it/s]
    428/499     0.206G    0.01856   0.009584    0.01604          1       320:
12%|#2        | 5/40 [00:00<00:06,  5.63it/s]
```

```
     428/499      0.206G      0.01956     0.009113     0.01634           2           320:
12%|#2          | 5/40 [00:01<00:06,  5.63it/s]
     428/499      0.206G      0.01956     0.009113     0.01634           2           320:
15%|#5          | 6/40 [00:01<00:06,  5.22it/s]
     428/499      0.206G      0.02223     0.009706     0.01685           4           320:
15%|#5          | 6/40 [00:01<00:06,  5.22it/s]
     428/499      0.206G      0.02223     0.009706     0.01685           4           320:
18%|#7          | 7/40 [00:01<00:06,  5.24it/s]
     428/499      0.206G      0.02075     0.009584     0.01683           2           320:
18%|#7          | 7/40 [00:01<00:06,  5.24it/s]
     428/499      0.206G      0.02075     0.009584     0.01683           2           320:
20%|##          | 8/40 [00:01<00:06,  5.13it/s]
     428/499      0.206G      0.02134     0.00949      0.01847           3           320:
20%|##          | 8/40 [00:01<00:06,  5.13it/s]
     428/499      0.206G      0.02134     0.00949      0.01847           3           320:
22%|##2         | 9/40 [00:01<00:06,  4.94it/s]
     428/499      0.206G      0.02076     0.009548     0.01832           3           320:
22%|##2         | 9/40 [00:01<00:06,  4.94it/s]
     428/499      0.206G      0.02076     0.009548     0.01832           3           320:
25%|##5         | 10/40 [00:01<00:05,  5.04it/s]
     428/499      0.206G      0.02035     0.009359     0.01821           2           320:
25%|##5         | 10/40 [00:02<00:05,  5.04it/s]
     428/499      0.206G      0.02035     0.009359     0.01821           2           320:
28%|##7         | 11/40 [00:02<00:05,  5.13it/s]
     428/499      0.206G      0.02017     0.009647     0.01837           4           320:
28%|##7         | 11/40 [00:02<00:05,  5.13it/s]
     428/499      0.206G      0.02017     0.009647     0.01837           4           320:
30%|###         | 12/40 [00:02<00:05,  4.94it/s]
     428/499      0.206G      0.01957     0.009193     0.01813           1           320:
30%|###         | 12/40 [00:02<00:05,  4.94it/s]
     428/499      0.206G      0.01957     0.009193     0.01813           1           320:
32%|###2        | 13/40 [00:02<00:05,  5.06it/s]
     428/499      0.206G      0.01878     0.00898      0.01833           2           320:
32%|###2        | 13/40 [00:02<00:05,  5.06it/s]
     428/499      0.206G      0.01878     0.00898      0.01833           2           320:
35%|###5        | 14/40 [00:02<00:05,  5.01it/s]
     428/499      0.206G      0.01919     0.009754     0.01902           4           320:
35%|###5        | 14/40 [00:02<00:05,  5.01it/s]
     428/499      0.206G      0.01919     0.009754     0.01902           4           320:
38%|###7        | 15/40 [00:02<00:05,  4.85it/s]
     428/499      0.206G      0.01838     0.009357     0.01884           1           320:
38%|###7        | 15/40 [00:03<00:05,  4.85it/s]
     428/499      0.206G      0.01838     0.009357     0.01884           1           320:
40%|####        | 16/40 [00:03<00:04,  4.99it/s]
     428/499      0.206G      0.0182      0.009291     0.01873           2           320:
40%|####        | 16/40 [00:03<00:04,  4.99it/s]
     428/499      0.206G      0.0182      0.009291     0.01873           2           320:
42%|####2       | 17/40 [00:03<00:04,  5.09it/s]
```

```
    428/499        0.206G      0.01969    0.009163       0.0197          2           320:
42%|####2     | 17/40 [00:03<00:04,  5.09it/s]
    428/499        0.206G      0.01969    0.009163       0.0197          2           320:
45%|####5     | 18/40 [00:03<00:04,  5.01it/s]
    428/499        0.206G      0.01972    0.009161      0.01951          2           320:
45%|####5     | 18/40 [00:03<00:04,  5.01it/s]
    428/499        0.206G      0.01972    0.009161      0.01951          2           320:
48%|####7     | 19/40 [00:03<00:04,  4.87it/s]
    428/499        0.206G      0.02062    0.009529      0.01995          4           320:
48%|####7     | 19/40 [00:03<00:04,  4.87it/s]
    428/499        0.206G      0.02062    0.009529      0.01995          4           320:
50%|#####     | 20/40 [00:03<00:04,  4.88it/s]
    428/499        0.206G      0.02061    0.009321      0.01972          1           320:
50%|#####     | 20/40 [00:04<00:04,  4.88it/s]
    428/499        0.206G      0.02061    0.009321      0.01972          1           320:
52%|#####2    | 21/40 [00:04<00:03,  5.01it/s]
    428/499        0.206G       0.0206    0.00962       0.01988          4           320:
52%|#####2    | 21/40 [00:04<00:03,  5.01it/s]
    428/499        0.206G       0.0206    0.00962       0.01988          4           320:
55%|#####5    | 22/40 [00:04<00:03,  4.87it/s]
    428/499        0.206G      0.02009    0.009322      0.01961          1           320:
55%|#####5    | 22/40 [00:04<00:03,  4.87it/s]
    428/499        0.206G      0.02009    0.009322      0.01961          1           320:
57%|#####7    | 23/40 [00:04<00:03,  5.09it/s]
    428/499        0.206G      0.01953    0.009095      0.01949          1           320:
57%|#####7    | 23/40 [00:04<00:03,  5.09it/s]
    428/499        0.206G      0.01953    0.009095      0.01949          1           320:
60%|######    | 24/40 [00:04<00:03,  5.29it/s]
    428/499        0.206G      0.01993    0.009558      0.01946          4           320:
60%|######    | 24/40 [00:04<00:03,  5.29it/s]
    428/499        0.206G      0.01993    0.009558      0.01946          4           320:
62%|######2   | 25/40 [00:04<00:02,  5.30it/s]
    428/499        0.206G      0.01947    0.00929       0.01929          1           320:
62%|######2   | 25/40 [00:05<00:02,  5.30it/s]
    428/499        0.206G      0.01947    0.00929       0.01929          1           320:
65%|######5   | 26/40 [00:05<00:02,  5.45it/s]
    428/499        0.206G      0.01922    0.009184       0.0192          2           320:
65%|######5   | 26/40 [00:05<00:02,  5.45it/s]
    428/499        0.206G      0.01922    0.009184       0.0192          2           320:
68%|######7   | 27/40 [00:05<00:02,  5.42it/s]
    428/499        0.206G      0.01881    0.009027      0.01921          2           320:
68%|######7   | 27/40 [00:05<00:02,  5.42it/s]
    428/499        0.206G      0.01881    0.009027      0.01921          2           320:
70%|#######   | 28/40 [00:05<00:02,  5.68it/s]
    428/499        0.206G      0.01879    0.009261      0.01942          4           320:
70%|#######   | 28/40 [00:05<00:02,  5.68it/s]
    428/499        0.206G      0.01879    0.009261      0.01942          4           320:
72%|#######2  | 29/40 [00:05<00:02,  5.41it/s]
```

52

```
    428/499      0.206G     0.01872      0.0093      0.0193        2          320:
72%|#######2  | 29/40 [00:05<00:02,  5.41it/s]
    428/499      0.206G     0.01872      0.0093      0.0193        2          320:
75%|#######5  | 30/40 [00:05<00:01,  5.38it/s]
    428/499      0.206G     0.01877     0.00957      0.0193        4          320:
75%|#######5  | 30/40 [00:05<00:01,  5.38it/s]
    428/499      0.206G     0.01877     0.00957      0.0193        4          320:
78%|#######7  | 31/40 [00:05<00:01,  5.51it/s]
    428/499      0.206G     0.01961    0.009517     0.01923        3          320:
78%|#######7  | 31/40 [00:06<00:01,  5.51it/s]
    428/499      0.206G     0.01961    0.009517     0.01923        3          320:
80%|########  | 32/40 [00:06<00:01,  5.57it/s]
    428/499      0.206G     0.01944    0.009443     0.01918        2          320:
80%|########  | 32/40 [00:06<00:01,  5.57it/s]
    428/499      0.206G     0.01944    0.009443     0.01918        2          320:
82%|########2 | 33/40 [00:06<00:01,  5.64it/s]
    428/499      0.206G     0.01965    0.009349     0.01925        2          320:
82%|########2 | 33/40 [00:06<00:01,  5.64it/s]
    428/499      0.206G     0.01965    0.009349     0.01925        2          320:
85%|########5 | 34/40 [00:06<00:01,  5.54it/s]
    428/499      0.206G     0.02063    0.009305     0.01925        3          320:
85%|########5 | 34/40 [00:06<00:01,  5.54it/s]
    428/499      0.206G     0.02063    0.009305     0.01925        3          320:
88%|########7 | 35/40 [00:06<00:00,  5.61it/s]
    428/499      0.206G     0.02036    0.009341     0.01912        2          320:
88%|########7 | 35/40 [00:06<00:00,  5.61it/s]
    428/499      0.206G     0.02036    0.009341     0.01912        2          320:
90%|######### | 36/40 [00:06<00:00,  5.39it/s]
    428/499      0.206G     0.02009    0.009247     0.01899        1          320:
90%|######### | 36/40 [00:07<00:00,  5.39it/s]
    428/499      0.206G     0.02009    0.009247     0.01899        1          320:
92%|#########2| 37/40 [00:07<00:00,  5.51it/s]
    428/499      0.206G     0.02014    0.009464     0.01906        4          320:
92%|#########2| 37/40 [00:07<00:00,  5.51it/s]
    428/499      0.206G     0.02014    0.009464     0.01906        4          320:
95%|#########5| 38/40 [00:07<00:00,  5.30it/s]
    428/499      0.206G     0.02007    0.009556     0.01904        4          320:
95%|#########5| 38/40 [00:07<00:00,  5.30it/s]
    428/499      0.206G     0.02007    0.009556     0.01904        4          320:
98%|#########7| 39/40 [00:07<00:00,  5.31it/s]
    428/499      0.206G     0.01992    0.009471     0.01899        2          320:
98%|#########7| 39/40 [00:07<00:00,  5.31it/s]
    428/499      0.206G     0.01992    0.009471     0.01899        2          320:
100%|##########| 40/40 [00:07<00:00,  5.58it/s]
    428/499      0.206G     0.01992    0.009471     0.01899        2          320:
100%|##########| 40/40 [00:07<00:00,  5.28it/s]

                 Class      Images  Instances           P          R       mAP50
```

```
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:01, 17.19it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:00, 16.47it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 17.25it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 15.91it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####        | 10/20 [00:00<00:00, 15.83it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  65%|######5      | 13/20 [00:00<00:00, 17.14it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|########     | 16/20 [00:00<00:00, 17.87it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|#########    | 18/20 [00:01<00:00, 17.08it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.57it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.12it/s]
                 all         40         40      0.989          1      0.995
0.754

      Epoch    GPU_mem    box_loss   obj_loss   cls_loss  Instances       Size

   0%|            | 0/40 [00:00<?, ?it/s]
     429/499     0.206G     0.04133   0.008075    0.02855          3       320:
0%|          | 0/40 [00:00<?, ?it/s]
     429/499     0.206G     0.04133   0.008075    0.02855          3       320:
2%|2          | 1/40 [00:00<00:06,  6.36it/s]
     429/499     0.206G     0.03349   0.006236    0.02108          1       320:
2%|2          | 1/40 [00:00<00:06,  6.36it/s]
     429/499     0.206G     0.03349   0.006236    0.02108          1       320:
5%|5          | 2/40 [00:00<00:06,  6.02it/s]
     429/499     0.206G     0.02648   0.006477    0.01987          2       320:
5%|5          | 2/40 [00:00<00:06,  6.02it/s]
     429/499     0.206G     0.02648   0.006477    0.01987          2       320:
8%|7          | 3/40 [00:00<00:05,  6.19it/s]
     429/499     0.206G     0.02259   0.006453    0.01851          2       320:
8%|7          | 3/40 [00:00<00:05,  6.19it/s]
     429/499     0.206G     0.02259   0.006453    0.01851          2       320:
10%|#          | 4/40 [00:00<00:06,  5.80it/s]
     429/499     0.206G     0.02203   0.007853    0.01958          4       320:
10%|#          | 4/40 [00:00<00:06,  5.80it/s]
     429/499     0.206G     0.02203   0.007853    0.01958          4       320:
12%|#2         | 5/40 [00:00<00:06,  5.80it/s]
     429/499     0.206G     0.02335   0.008926    0.02062          4       320:
```

54

```
12%|#2         | 5/40 [00:01<00:06,  5.80it/s]
    429/499    0.206G   0.02335   0.008926   0.02062        4        320:
15%|#5         | 6/40 [00:01<00:06,  5.47it/s]
    429/499    0.206G   0.02301   0.008571   0.02231        2        320:
15%|#5         | 6/40 [00:01<00:06,  5.47it/s]
    429/499    0.206G   0.02301   0.008571   0.02231        2        320:
18%|#7         | 7/40 [00:01<00:06,  5.42it/s]
    429/499    0.206G   0.02158   0.008212   0.02123        1        320:
18%|#7         | 7/40 [00:01<00:06,  5.42it/s]
    429/499    0.206G   0.02158   0.008212   0.02123        1        320:
20%|##         | 8/40 [00:01<00:05,  5.54it/s]
    429/499    0.206G   0.02058   0.007933   0.02039        1        320:
20%|##         | 8/40 [00:01<00:05,  5.54it/s]
    429/499    0.206G   0.02058   0.007933   0.02039        1        320:
22%|##2        | 9/40 [00:01<00:05,  5.63it/s]
    429/499    0.206G   0.01986   0.008087   0.02025        2        320:
22%|##2        | 9/40 [00:01<00:05,  5.63it/s]
    429/499    0.206G   0.01986   0.008087   0.02025        2        320:
25%|##5        | 10/40 [00:01<00:05,  5.51it/s]
    429/499    0.206G   0.02178   0.008604   0.02123        4        320:
25%|##5        | 10/40 [00:01<00:05,  5.51it/s]
    429/499    0.206G   0.02178   0.008604   0.02123        4        320:
28%|##7        | 11/40 [00:01<00:05,  5.60it/s]
    429/499    0.206G   0.02085   0.008133   0.02062        1        320:
28%|##7        | 11/40 [00:02<00:05,  5.60it/s]
    429/499    0.206G   0.02085   0.008133   0.02062        1        320:
30%|###        | 12/40 [00:02<00:04,  5.67it/s]
    429/499    0.206G    0.0208   0.008135   0.02035        2        320:
30%|###        | 12/40 [00:02<00:04,  5.67it/s]
    429/499    0.206G    0.0208   0.008135   0.02035        2        320:
32%|###2       | 13/40 [00:02<00:04,  5.68it/s]
    429/499    0.206G   0.02004   0.007923   0.01993        1        320:
32%|###2       | 13/40 [00:02<00:04,  5.68it/s]
    429/499    0.206G   0.02004   0.007923   0.01993        1        320:
35%|###5       | 14/40 [00:02<00:04,  5.53it/s]
    429/499    0.206G   0.01953   0.007828   0.01975        1        320:
35%|###5       | 14/40 [00:02<00:04,  5.53it/s]
    429/499    0.206G   0.01953   0.007828   0.01975        1        320:
38%|###7       | 15/40 [00:02<00:04,  5.66it/s]
    429/499    0.206G   0.01907   0.007727   0.01985        2        320:
38%|###7       | 15/40 [00:02<00:04,  5.66it/s]
    429/499    0.206G   0.01907   0.007727   0.01985        2        320:
40%|####       | 16/40 [00:02<00:04,  5.68it/s]
    429/499    0.206G   0.01908   0.007981   0.01978        4        320:
40%|####       | 16/40 [00:03<00:04,  5.68it/s]
    429/499    0.206G   0.01908   0.007981   0.01978        4        320:
42%|####2      | 17/40 [00:03<00:04,  5.57it/s]
    429/499    0.206G   0.01917   0.008366   0.02003        4        320:
```

```
42%|####2      | 17/40 [00:03<00:04,  5.57it/s]
     429/499    0.206G    0.01917    0.008366    0.02003         4         320:
45%|####5      | 18/40 [00:03<00:03,  5.64it/s]
     429/499    0.206G    0.01874    0.008196    0.01957         1         320:
45%|####5      | 18/40 [00:03<00:03,  5.64it/s]
     429/499    0.206G    0.01874    0.008196    0.01957         1         320:
48%|####7      | 19/40 [00:03<00:03,  5.68it/s]
     429/499    0.206G     0.0188    0.008159    0.02036         2         320:
48%|####7      | 19/40 [00:03<00:03,  5.68it/s]
     429/499    0.206G     0.0188    0.008159    0.02036         2         320:
50%|#####      | 20/40 [00:03<00:03,  5.57it/s]
     429/499    0.206G    0.01954    0.008456    0.02111         4         320:
50%|#####      | 20/40 [00:03<00:03,  5.57it/s]
     429/499    0.206G    0.01954    0.008456    0.02111         4         320:
52%|#####2     | 21/40 [00:03<00:03,  5.64it/s]
     429/499    0.206G    0.01927    0.008221    0.02089         1         320:
52%|#####2     | 21/40 [00:03<00:03,  5.64it/s]
     429/499    0.206G    0.01927    0.008221    0.02089         1         320:
55%|#####5     | 22/40 [00:03<00:03,  5.55it/s]
     429/499    0.206G    0.01979    0.00852     0.02131         4         320:
55%|#####5     | 22/40 [00:04<00:03,  5.55it/s]
     429/499    0.206G    0.01979    0.00852     0.02131         4         320:
57%|#####7     | 23/40 [00:04<00:03,  5.63it/s]
     429/499    0.206G    0.01936    0.008436    0.02115         2         320:
57%|#####7     | 23/40 [00:04<00:03,  5.63it/s]
     429/499    0.206G    0.01936    0.008436    0.02115         2         320:
60%|######     | 24/40 [00:04<00:02,  5.68it/s]
     429/499    0.206G    0.01932    0.008483    0.02093         2         320:
60%|######     | 24/40 [00:04<00:02,  5.68it/s]
     429/499    0.206G    0.01932    0.008483    0.02093         2         320:
62%|######2    | 25/40 [00:04<00:02,  5.70it/s]
     429/499    0.206G    0.01915    0.00829     0.02089         1         320:
62%|######2    | 25/40 [00:04<00:02,  5.70it/s]
     429/499    0.206G    0.01915    0.00829     0.02089         1         320:
65%|######5    | 26/40 [00:04<00:02,  5.73it/s]
     429/499    0.206G    0.01905    0.008315    0.02132         2         320:
65%|######5    | 26/40 [00:04<00:02,  5.73it/s]
     429/499    0.206G    0.01905    0.008315    0.02132         2         320:
68%|######7    | 27/40 [00:04<00:02,  5.76it/s]
     429/499    0.206G    0.01895    0.008247    0.0211          2         320:
68%|######7    | 27/40 [00:04<00:02,  5.76it/s]
     429/499    0.206G    0.01895    0.008247    0.0211          2         320:
70%|#######    | 28/40 [00:04<00:02,  5.75it/s]
     429/499    0.206G    0.01946    0.008228    0.0212          2         320:
70%|#######    | 28/40 [00:05<00:02,  5.75it/s]
     429/499    0.206G    0.01946    0.008228    0.0212          2         320:
72%|#######2   | 29/40 [00:05<00:01,  5.77it/s]
     429/499    0.206G    0.01999    0.008211    0.0214          2         320:
```

```
72%|#######2  | 29/40 [00:05<00:01,  5.77it/s]
     429/499     0.206G    0.01999    0.008211     0.0214        2       320:
75%|#######5  | 30/40 [00:05<00:01,  5.63it/s]
     429/499     0.206G    0.01963    0.008054    0.02108        1       320:
75%|#######5  | 30/40 [00:05<00:01,  5.63it/s]
     429/499     0.206G    0.01963    0.008054    0.02108        1       320:
78%|#######7  | 31/40 [00:05<00:01,  5.52it/s]
     429/499     0.206G    0.01972    0.008188    0.02123        4       320:
78%|#######7  | 31/40 [00:05<00:01,  5.52it/s]
     429/499     0.206G    0.01972    0.008188    0.02123        4       320:
80%|########  | 32/40 [00:05<00:01,  5.33it/s]
     429/499     0.206G     0.0194    0.008108    0.02102        2       320:
80%|########  | 32/40 [00:05<00:01,  5.33it/s]
     429/499     0.206G     0.0194    0.008108    0.02102        2       320:
82%|########2 | 33/40 [00:05<00:01,  5.61it/s]
     429/499     0.206G    0.01996     0.00815    0.02093        2       320:
82%|########2 | 33/40 [00:06<00:01,  5.61it/s]
     429/499     0.206G    0.01996     0.00815    0.02093        2       320:
85%|########5 | 34/40 [00:06<00:01,  5.50it/s]
     429/499     0.206G    0.02012    0.008124    0.02127        2       320:
85%|########5 | 34/40 [00:06<00:01,  5.50it/s]
     429/499     0.206G    0.02012    0.008124    0.02127        2       320:
88%|########7 | 35/40 [00:06<00:00,  5.60it/s]
     429/499     0.206G    0.01988    0.008191    0.02107        2       320:
88%|########7 | 35/40 [00:06<00:00,  5.60it/s]
     429/499     0.206G    0.01988    0.008191    0.02107        2       320:
90%|######### | 36/40 [00:06<00:00,  5.66it/s]
     429/499     0.206G    0.02001    0.008182     0.0212        1       320:
90%|######### | 36/40 [00:06<00:00,  5.66it/s]
     429/499     0.206G    0.02001    0.008182     0.0212        1       320:
92%|#########2| 37/40 [00:06<00:00,  5.70it/s]
     429/499     0.206G    0.02023    0.008273    0.02126        4       320:
92%|#########2| 37/40 [00:06<00:00,  5.70it/s]
     429/499     0.206G    0.02023    0.008273    0.02126        4       320:
95%|#########5| 38/40 [00:06<00:00,  5.58it/s]
     429/499     0.206G     0.0202    0.008524    0.02146        4       320:
95%|#########5| 38/40 [00:06<00:00,  5.58it/s]
     429/499     0.206G     0.0202    0.008524    0.02146        4       320:
98%|#########7| 39/40 [00:06<00:00,  5.50it/s]
     429/499     0.206G     0.0199    0.008481    0.02127        2       320:
98%|#########7| 39/40 [00:07<00:00,  5.50it/s]
     429/499     0.206G     0.0199    0.008481    0.02127        2       320:
100%|##########| 40/40 [00:07<00:00,  5.72it/s]
     429/499     0.206G     0.0199    0.008481    0.02127        2       320:
100%|##########| 40/40 [00:07<00:00,  5.64it/s]

                Class      Images  Instances          P         R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
```

```
              Class     Images  Instances         P           R      mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:00, 18.28it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:00, 16.87it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 16.43it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 15.41it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95:  50%|#####        | 10/20 [00:00<00:00, 16.34it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95:  60%|######       | 12/20 [00:00<00:00, 16.95it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95:  70%|#######      | 14/20 [00:00<00:00, 16.62it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95:  80%|########     | 16/20 [00:00<00:00, 16.01it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95:  90%|#########  | 18/20 [00:01<00:00, 16.05it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.24it/s]
              Class     Images  Instances         P           R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.33it/s]
                all        40         40       0.989          1      0.995
0.754


      Epoch    GPU_mem    box_loss    obj_loss    cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
    430/499     0.206G     0.01916    0.008261     0.02488          2       320:
0%|           | 0/40 [00:00<?, ?it/s]
    430/499     0.206G     0.01916    0.008261     0.02488          2       320:
2%|2          | 1/40 [00:00<00:07,  4.92it/s]
    430/499     0.206G     0.02411     0.01299     0.02317          4       320:
2%|2          | 1/40 [00:00<00:07,  4.92it/s]
    430/499     0.206G     0.02411     0.01299     0.02317          4       320:
5%|5          | 2/40 [00:00<00:07,  4.92it/s]
    430/499     0.206G     0.02111     0.01255     0.01995          2       320:
5%|5          | 2/40 [00:00<00:07,  4.92it/s]
    430/499     0.206G     0.02111     0.01255     0.01995          2       320:
8%|7          | 3/40 [00:00<00:07,  4.92it/s]
    430/499     0.206G     0.01821     0.01009     0.02102          1       320:
8%|7          | 3/40 [00:00<00:07,  4.92it/s]
    430/499     0.206G     0.01821     0.01009     0.02102          1       320:
10%|#          | 4/40 [00:00<00:07,  5.07it/s]
    430/499     0.206G     0.02084     0.01189     0.02107          4       320:
10%|#          | 4/40 [00:01<00:07,  5.07it/s]
    430/499     0.206G     0.02084     0.01189     0.02107          4       320:
12%|#2         | 5/40 [00:01<00:07,  4.73it/s]
```

```
    430/499      0.206G     0.02376     0.01297      0.0211         4           320:
12%|#2         | 5/40 [00:01<00:07,  4.73it/s]
    430/499      0.206G     0.02376     0.01297      0.0211         4           320:
15%|#5         | 6/40 [00:01<00:07,  4.79it/s]
    430/499      0.206G     0.02233     0.01153     0.02028         1           320:
15%|#5         | 6/40 [00:01<00:07,  4.79it/s]
    430/499      0.206G     0.02233     0.01153     0.02028         1           320:
18%|#7         | 7/40 [00:01<00:06,  4.79it/s]
    430/499      0.206G     0.02044     0.01038     0.02064         1           320:
18%|#7         | 7/40 [00:01<00:06,  4.79it/s]
    430/499      0.206G     0.02044     0.01038     0.02064         1           320:
20%|##         | 8/40 [00:01<00:06,  4.86it/s]
    430/499      0.206G     0.01941    0.009626     0.02001         1           320:
20%|##         | 8/40 [00:01<00:06,  4.86it/s]
    430/499      0.206G     0.01941    0.009626     0.02001         1           320:
22%|##2        | 9/40 [00:01<00:06,  5.00it/s]
    430/499      0.206G     0.01852     0.00893     0.01934         1           320:
22%|##2        | 9/40 [00:02<00:06,  5.00it/s]
    430/499      0.206G     0.01852     0.00893     0.01934         1           320:
25%|##5        | 10/40 [00:02<00:05,  5.08it/s]
    430/499      0.206G     0.02019    0.009299     0.01997         4           320:
25%|##5        | 10/40 [00:02<00:05,  5.08it/s]
    430/499      0.206G     0.02019    0.009299     0.01997         4           320:
28%|##7        | 11/40 [00:02<00:05,  5.16it/s]
    430/499      0.206G     0.02334    0.008891     0.02046         2           320:
28%|##7        | 11/40 [00:02<00:05,  5.16it/s]
    430/499      0.206G     0.02334    0.008891     0.02046         2           320:
30%|###        | 12/40 [00:02<00:05,  5.20it/s]
    430/499      0.206G     0.02224    0.008443     0.02003         1           320:
30%|###        | 12/40 [00:02<00:05,  5.20it/s]
    430/499      0.206G     0.02224    0.008443     0.02003         1           320:
32%|###2       | 13/40 [00:02<00:05,  5.36it/s]
    430/499      0.206G     0.02175    0.008311     0.01973         2           320:
32%|###2       | 13/40 [00:02<00:05,  5.36it/s]
    430/499      0.206G     0.02175    0.008311     0.01973         2           320:
35%|###5       | 14/40 [00:02<00:04,  5.35it/s]
    430/499      0.206G     0.02112     0.00802     0.01943         1           320:
35%|###5       | 14/40 [00:02<00:04,  5.35it/s]
    430/499      0.206G     0.02112     0.00802     0.01943         1           320:
38%|###7       | 15/40 [00:02<00:04,  5.49it/s]
    430/499      0.206G     0.02122       0.008      0.0193         2           320:
38%|###7       | 15/40 [00:03<00:04,  5.49it/s]
    430/499      0.206G     0.02122       0.008      0.0193         2           320:
40%|####       | 16/40 [00:03<00:04,  5.31it/s]
    430/499      0.206G     0.02155    0.008091      0.0193         2           320:
40%|####       | 16/40 [00:03<00:04,  5.31it/s]
    430/499      0.206G     0.02155    0.008091      0.0193         2           320:
42%|####2      | 17/40 [00:03<00:04,  5.45it/s]
```

```
     430/499       0.206G      0.02094    0.007838      0.01898           1           320:
42%|####2     | 17/40 [00:03<00:04,  5.45it/s]
     430/499       0.206G      0.02094    0.007838      0.01898           1           320:
45%|####5     | 18/40 [00:03<00:03,  5.56it/s]
     430/499       0.206G      0.02084    0.008085      0.01908           4           320:
45%|####5     | 18/40 [00:03<00:03,  5.56it/s]
     430/499       0.206G      0.02084    0.008085      0.01908           4           320:
48%|####7     | 19/40 [00:03<00:03,  5.60it/s]
     430/499       0.206G      0.02173     0.00842      0.01909           4           320:
48%|####7     | 19/40 [00:03<00:03,  5.60it/s]
     430/499       0.206G      0.02173     0.00842      0.01909           4           320:
50%|#####     | 20/40 [00:03<00:03,  5.25it/s]
     430/499       0.206G      0.02141    0.008315       0.019           2           320:
50%|#####     | 20/40 [00:04<00:03,  5.25it/s]
     430/499       0.206G      0.02141    0.008315       0.019           2           320:
52%|#####2    | 21/40 [00:04<00:03,  5.25it/s]
     430/499       0.206G       0.0222    0.008413      0.01892           2           320:
52%|#####2    | 21/40 [00:04<00:03,  5.25it/s]
     430/499       0.206G       0.0222    0.008413      0.01892           2           320:
55%|#####5    | 22/40 [00:04<00:03,  5.28it/s]
     430/499       0.206G      0.02255    0.008699      0.01937           4           320:
55%|#####5    | 22/40 [00:04<00:03,  5.28it/s]
     430/499       0.206G      0.02255    0.008699      0.01937           4           320:
57%|#####7    | 23/40 [00:04<00:03,  5.43it/s]
     430/499       0.206G      0.02232    0.008748      0.01908           2           320:
57%|#####7    | 23/40 [00:04<00:03,  5.43it/s]
     430/499       0.206G      0.02232    0.008748      0.01908           2           320:
60%|######    | 24/40 [00:04<00:03,  5.32it/s]
     430/499       0.206G      0.02339     0.00862      0.01903           2           320:
60%|######    | 24/40 [00:04<00:03,  5.32it/s]
     430/499       0.206G      0.02339     0.00862      0.01903           2           320:
62%|######2   | 25/40 [00:04<00:02,  5.53it/s]
     430/499       0.206G       0.0233    0.008778      0.01922           4           320:
62%|######2   | 25/40 [00:04<00:02,  5.53it/s]
     430/499       0.206G       0.0233    0.008778      0.01922           4           320:
65%|######5   | 26/40 [00:04<00:02,  5.33it/s]
     430/499       0.206G      0.02327    0.008982      0.01931           4           320:
65%|######5   | 26/40 [00:05<00:02,  5.33it/s]
     430/499       0.206G      0.02327    0.008982      0.01931           4           320:
68%|######7   | 27/40 [00:05<00:02,  5.41it/s]
     430/499       0.206G      0.02307      0.0088       0.0191           1           320:
68%|######7   | 27/40 [00:05<00:02,  5.41it/s]
     430/499       0.206G      0.02307      0.0088       0.0191           1           320:
70%|#######   | 28/40 [00:05<00:02,  5.57it/s]
     430/499       0.206G      0.02307    0.008955      0.01957           4           320:
70%|#######   | 28/40 [00:05<00:02,  5.57it/s]
     430/499       0.206G      0.02307    0.008955      0.01957           4           320:
72%|#######2  | 29/40 [00:05<00:02,  5.50it/s]
```

```
    430/499      0.206G      0.02277     0.008785      0.01964          1          320:
72%|#######2 | 29/40 [00:05<00:02,  5.50it/s]
    430/499      0.206G      0.02277     0.008785      0.01964          1          320:
75%|#######5 | 30/40 [00:05<00:01,  5.45it/s]
    430/499      0.206G      0.02241     0.008598      0.01967          1          320:
75%|#######5 | 30/40 [00:05<00:01,  5.45it/s]
    430/499      0.206G      0.02241     0.008598      0.01967          1          320:
78%|#######7 | 31/40 [00:05<00:01,  5.55it/s]
    430/499      0.206G      0.02195     0.008413      0.01959          1          320:
78%|#######7 | 31/40 [00:06<00:01,  5.55it/s]
    430/499      0.206G      0.02195     0.008413      0.01959          1          320:
80%|######## | 32/40 [00:06<00:01,  5.48it/s]
    430/499      0.206G      0.02164     0.008295      0.01948          2          320:
80%|######## | 32/40 [00:06<00:01,  5.48it/s]
    430/499      0.206G      0.02164     0.008295      0.01948          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.56it/s]
    430/499      0.206G      0.02139     0.008295       0.0194          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.56it/s]
    430/499      0.206G      0.02139     0.008295       0.0194          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.79it/s]
    430/499      0.206G      0.02102      0.00824       0.0192          1          320:
85%|########5 | 34/40 [00:06<00:01,  5.79it/s]
    430/499      0.206G      0.02102      0.00824       0.0192          1          320:
88%|########7 | 35/40 [00:06<00:00,  5.64it/s]
    430/499      0.206G      0.02119      0.00824      0.01916          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.64it/s]
    430/499      0.206G      0.02119      0.00824      0.01916          2          320:
90%|######### | 36/40 [00:06<00:00,  5.38it/s]
    430/499      0.206G      0.02125     0.008218      0.01929          2          320:
90%|######### | 36/40 [00:06<00:00,  5.38it/s]
    430/499      0.206G      0.02125     0.008218      0.01929          2          320:
92%|#########2| 37/40 [00:06<00:00,  5.50it/s]
    430/499      0.206G      0.02097     0.008171      0.01928          2          320:
92%|#########2| 37/40 [00:07<00:00,  5.50it/s]
    430/499      0.206G      0.02097     0.008171      0.01928          2          320:
95%|#########5| 38/40 [00:07<00:00,  5.59it/s]
    430/499      0.206G      0.02062     0.008044      0.01919          1          320:
95%|#########5| 38/40 [00:07<00:00,  5.59it/s]
    430/499      0.206G      0.02062     0.008044      0.01919          1          320:
98%|#########7| 39/40 [00:07<00:00,  5.36it/s]
    430/499      0.206G      0.02124     0.008018      0.01922          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.36it/s]
    430/499      0.206G      0.02124     0.008018      0.01922          2          320:
100%|##########| 40/40 [00:07<00:00,  5.22it/s]
    430/499      0.206G      0.02124     0.008018      0.01922          2          320:
100%|##########| 40/40 [00:07<00:00,  5.30it/s]

             Class      Images   Instances            P          R        mAP50
```

```
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:00, 18.21it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:00, 16.70it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 17.40it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 17.74it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 17.07it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 17.44it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 17.70it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:00<00:00, 17.15it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 17.93it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.74it/s]
                all         40         40      0.987      0.988      0.995
0.794

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
     431/499     0.206G    0.01577   0.008053     0.0162          2        320:
0%|            | 0/40 [00:00<?, ?it/s]
     431/499     0.206G    0.01577   0.008053     0.0162          2        320:
2%|2           | 1/40 [00:00<00:06,  5.81it/s]
     431/499     0.206G    0.01094   0.005501    0.01849          1        320:
2%|2           | 1/40 [00:00<00:06,  5.81it/s]
     431/499     0.206G    0.01094   0.005501    0.01849          1        320:
5%|5           | 2/40 [00:00<00:06,  5.82it/s]
     431/499     0.206G    0.02358   0.007496    0.02801          2        320:
5%|5           | 2/40 [00:00<00:06,  5.82it/s]
     431/499     0.206G    0.02358   0.007496    0.02801          2        320:
8%|7           | 3/40 [00:00<00:06,  5.77it/s]
     431/499     0.206G    0.02013   0.006631    0.02644          1        320:
8%|7           | 3/40 [00:00<00:06,  5.77it/s]
     431/499     0.206G    0.02013   0.006631    0.02644          1        320:
10%|#           | 4/40 [00:00<00:06,  5.79it/s]
     431/499     0.206G    0.01768   0.005887    0.02486          1        320:
10%|#           | 4/40 [00:00<00:06,  5.79it/s]
     431/499     0.206G    0.01768   0.005887    0.02486          1        320:
12%|#2          | 5/40 [00:00<00:06,  5.80it/s]
     431/499     0.206G    0.01629   0.005873    0.02337          2        320:
```

```
12%|#2          | 5/40 [00:01<00:06,  5.80it/s]
     431/499     0.206G     0.01629    0.005873   0.02337         2         320:
15%|#5          | 6/40 [00:01<00:05,  5.80it/s]
     431/499     0.206G     0.02226    0.005802   0.02285         3         320:
15%|#5          | 6/40 [00:01<00:05,  5.80it/s]
     431/499     0.206G     0.02226    0.005802   0.02285         3         320:
18%|#7          | 7/40 [00:01<00:06,  5.47it/s]
     431/499     0.206G     0.02103    0.005592   0.02245         1         320:
18%|#7          | 7/40 [00:01<00:06,  5.47it/s]
     431/499     0.206G     0.02103    0.005592   0.02245         1         320:
20%|##          | 8/40 [00:01<00:05,  5.57it/s]
     431/499     0.206G     0.02003    0.005513   0.02164         1         320:
20%|##          | 8/40 [00:01<00:05,  5.57it/s]
     431/499     0.206G     0.02003    0.005513   0.02164         1         320:
22%|##2         | 9/40 [00:01<00:05,  5.80it/s]
     431/499     0.206G     0.02269    0.005684   0.02197         2         320:
22%|##2         | 9/40 [00:01<00:05,  5.80it/s]
     431/499     0.206G     0.02269    0.005684   0.02197         2         320:
25%|##5         | 10/40 [00:01<00:05,  5.64it/s]
     431/499     0.206G     0.02164    0.005895   0.02158         2         320:
25%|##5         | 10/40 [00:01<00:05,  5.64it/s]
     431/499     0.206G     0.02164    0.005895   0.02158         2         320:
28%|##7         | 11/40 [00:01<00:05,  5.70it/s]
     431/499     0.206G     0.02104    0.005761   0.02104         1         320:
28%|##7         | 11/40 [00:02<00:05,  5.70it/s]
     431/499     0.206G     0.02104    0.005761   0.02104         1         320:
30%|###         | 12/40 [00:02<00:04,  5.73it/s]
     431/499     0.206G     0.02056    0.005744   0.02054         2         320:
30%|###         | 12/40 [00:02<00:04,  5.73it/s]
     431/499     0.206G     0.02056    0.005744   0.02054         2         320:
32%|###2        | 13/40 [00:02<00:04,  5.60it/s]
     431/499     0.206G     0.02192    0.005973   0.02027         2         320:
32%|###2        | 13/40 [00:02<00:04,  5.60it/s]
     431/499     0.206G     0.02192    0.005973   0.02027         2         320:
35%|###5        | 14/40 [00:02<00:04,  5.62it/s]
     431/499     0.206G     0.02101    0.005743   0.01973         1         320:
35%|###5        | 14/40 [00:02<00:04,  5.62it/s]
     431/499     0.206G     0.02101    0.005743   0.01973         1         320:
38%|###7        | 15/40 [00:02<00:04,  5.55it/s]
     431/499     0.206G     0.02022    0.005534   0.01953         1         320:
38%|###7        | 15/40 [00:02<00:04,  5.55it/s]
     431/499     0.206G     0.02022    0.005534   0.01953         1         320:
40%|####        | 16/40 [00:02<00:04,  5.63it/s]
     431/499     0.206G     0.02026    0.005745   0.02017         3         320:
40%|####        | 16/40 [00:02<00:04,  5.63it/s]
     431/499     0.206G     0.02026    0.005745   0.02017         3         320:
42%|####2       | 17/40 [00:02<00:04,  5.68it/s]
     431/499     0.206G     0.02176    0.006366   0.02062         4         320:
```

```
42%|####2      | 17/40 [00:03<00:04,  5.68it/s]
     431/499    0.206G    0.02176   0.006366   0.02062       4       320:
45%|####5      | 18/40 [00:03<00:03,  5.70it/s]
     431/499    0.206G    0.02185   0.006804   0.02058       4       320:
45%|####5      | 18/40 [00:03<00:03,  5.70it/s]
     431/499    0.206G    0.02185   0.006804   0.02058       4       320:
48%|####7      | 19/40 [00:03<00:03,  5.44it/s]
     431/499    0.206G    0.02136   0.006751   0.02028       1       320:
48%|####7      | 19/40 [00:03<00:03,  5.44it/s]
     431/499    0.206G    0.02136   0.006751   0.02028       1       320:
50%|#####      | 20/40 [00:03<00:03,  5.55it/s]
     431/499    0.206G    0.02076   0.006824   0.02016       2       320:
50%|#####      | 20/40 [00:03<00:03,  5.55it/s]
     431/499    0.206G    0.02076   0.006824   0.02016       2       320:
52%|#####2     | 21/40 [00:03<00:03,  5.47it/s]
     431/499    0.206G    0.02017   0.006655   0.01987       1       320:
52%|#####2     | 21/40 [00:03<00:03,  5.47it/s]
     431/499    0.206G    0.02017   0.006655   0.01987       1       320:
55%|#####5     | 22/40 [00:03<00:03,  5.57it/s]
     431/499    0.206G    0.02044   0.00675    0.02064       2       320:
55%|#####5     | 22/40 [00:04<00:03,  5.57it/s]
     431/499    0.206G    0.02044   0.00675    0.02064       2       320:
57%|#####7     | 23/40 [00:04<00:03,  5.64it/s]
     431/499    0.206G    0.02027   0.006615   0.02046       1       320:
57%|#####7     | 23/40 [00:04<00:03,  5.64it/s]
     431/499    0.206G    0.02027   0.006615   0.02046       1       320:
60%|######     | 24/40 [00:04<00:02,  5.67it/s]
     431/499    0.206G    0.02126   0.006708   0.02075       3       320:
60%|######     | 24/40 [00:04<00:02,  5.67it/s]
     431/499    0.206G    0.02126   0.006708   0.02075       3       320:
62%|######2    | 25/40 [00:04<00:02,  5.71it/s]
     431/499    0.206G    0.02099   0.006752   0.02046       2       320:
62%|######2    | 25/40 [00:04<00:02,  5.71it/s]
     431/499    0.206G    0.02099   0.006752   0.02046       2       320:
65%|######5    | 26/40 [00:04<00:02,  5.47it/s]
     431/499    0.206G    0.02067   0.00668    0.02038       2       320:
65%|######5    | 26/40 [00:04<00:02,  5.47it/s]
     431/499    0.206G    0.02067   0.00668    0.02038       2       320:
68%|######7    | 27/40 [00:04<00:02,  5.55it/s]
     431/499    0.206G    0.02153   0.006687    0.0202       2       320:
68%|######7    | 27/40 [00:04<00:02,  5.55it/s]
     431/499    0.206G    0.02153   0.006687    0.0202       2       320:
70%|#######    | 28/40 [00:04<00:02,  5.63it/s]
     431/499    0.206G    0.02105   0.006807   0.02014       2       320:
70%|#######    | 28/40 [00:05<00:02,  5.63it/s]
     431/499    0.206G    0.02105   0.006807   0.02014       2       320:
72%|#######2   | 29/40 [00:05<00:01,  5.53it/s]
     431/499    0.206G    0.02156   0.00678    0.02062       3       320:
```

```
72%|#######2  | 29/40 [00:05<00:01,  5.53it/s]
     431/499      0.206G    0.02156    0.00678     0.02062          3          320:
75%|#######5  | 30/40 [00:05<00:01,  5.56it/s]
     431/499      0.206G    0.02121    0.006899     0.0205          2          320:
75%|#######5  | 30/40 [00:05<00:01,  5.56it/s]
     431/499      0.206G    0.02121    0.006899     0.0205          2          320:
78%|#######7  | 31/40 [00:05<00:01,  5.49it/s]
     431/499      0.206G    0.02136    0.007219    0.02054          4          320:
78%|#######7  | 31/40 [00:05<00:01,  5.49it/s]
     431/499      0.206G    0.02136    0.007219    0.02054          4          320:
80%|########  | 32/40 [00:05<00:01,  5.34it/s]
     431/499      0.206G    0.02096    0.007129    0.02034          1          320:
80%|########  | 32/40 [00:05<00:01,  5.34it/s]
     431/499      0.206G    0.02096    0.007129    0.02034          1          320:
82%|#######2 | 33/40 [00:05<00:01,  5.60it/s]
     431/499      0.206G    0.02056    0.007003    0.02015          1          320:
82%|#######2 | 33/40 [00:06<00:01,  5.60it/s]
     431/499      0.206G    0.02056    0.007003    0.02015          1          320:
85%|#######5 | 34/40 [00:06<00:01,  5.82it/s]
     431/499      0.206G    0.02054    0.007194    0.02008          4          320:
85%|#######5 | 34/40 [00:06<00:01,  5.82it/s]
     431/499      0.206G    0.02054    0.007194    0.02008          4          320:
88%|#######7 | 35/40 [00:06<00:00,  5.55it/s]
     431/499      0.206G     0.0202    0.007107    0.01995          1          320:
88%|#######7 | 35/40 [00:06<00:00,  5.55it/s]
     431/499      0.206G     0.0202    0.007107    0.01995          1          320:
90%|######### | 36/40 [00:06<00:00,  5.57it/s]
     431/499      0.206G    0.02004    0.007115    0.01982          2          320:
90%|######### | 36/40 [00:06<00:00,  5.57it/s]
     431/499      0.206G    0.02004    0.007115    0.01982          2          320:
92%|#########2| 37/40 [00:06<00:00,  5.36it/s]
     431/499      0.206G    0.02006    0.007188    0.01985          2          320:
92%|#########2| 37/40 [00:06<00:00,  5.36it/s]
     431/499      0.206G    0.02006    0.007188    0.01985          2          320:
95%|#########5| 38/40 [00:06<00:00,  5.09it/s]
     431/499      0.206G     0.0197    0.007113    0.01996          1          320:
95%|#########5| 38/40 [00:07<00:00,  5.09it/s]
     431/499      0.206G     0.0197    0.007113    0.01996          1          320:
98%|#########7| 39/40 [00:07<00:00,  5.16it/s]
     431/499      0.206G    0.01971    0.007446    0.01998          4          320:
98%|#########7| 39/40 [00:07<00:00,  5.16it/s]
     431/499      0.206G    0.01971    0.007446    0.01998          4          320:
100%|##########| 40/40 [00:07<00:00,  4.72it/s]
     431/499      0.206G    0.01971    0.007446    0.01998          4          320:
100%|##########| 40/40 [00:07<00:00,  5.50it/s]

                 Class      Images  Instances          P          R      mAP50
mAP50-95:    0%|               | 0/20 [00:00<?, ?it/s]
```

```
              Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 11.79it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:01, 13.95it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 14.07it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 13.39it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 13.67it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 13.85it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:01<00:00, 13.40it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:01<00:00, 14.22it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 14.73it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.09it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.19it/s]
                all         40         40      0.987      0.988      0.995
0.794


      Epoch    GPU_mem    box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    432/499     0.206G     0.01588   0.007378    0.01957          2        320:
0%|           | 0/40 [00:00<?, ?it/s]
    432/499     0.206G     0.01588   0.007378    0.01957          2        320:
2%|2          | 1/40 [00:00<00:06,  5.82it/s]
    432/499     0.206G     0.01233   0.005021    0.01686          1        320:
2%|2          | 1/40 [00:00<00:06,  5.82it/s]
    432/499     0.206G     0.01233   0.005021    0.01686          1        320:
5%|5          | 2/40 [00:00<00:06,  5.78it/s]
    432/499     0.206G     0.01254   0.005209    0.01705          2        320:
5%|5          | 2/40 [00:00<00:06,  5.78it/s]
    432/499     0.206G     0.01254   0.005209    0.01705          2        320:
8%|7          | 3/40 [00:00<00:06,  5.80it/s]
    432/499     0.206G     0.02306   0.006582    0.01728          2        320:
8%|7          | 3/40 [00:00<00:06,  5.80it/s]
    432/499     0.206G     0.02306   0.006582    0.01728          2        320:
10%|#          | 4/40 [00:00<00:07,  4.92it/s]
    432/499     0.206G     0.02019   0.006173    0.01653          1        320:
10%|#          | 4/40 [00:00<00:07,  4.92it/s]
    432/499     0.206G     0.02019   0.006173    0.01653          1        320:
12%|#2         | 5/40 [00:00<00:06,  5.21it/s]
```

```
   432/499      0.206G    0.01898    0.007102     0.0168       4        320:
12%|#2         | 5/40 [00:01<00:06,  5.21it/s]
   432/499      0.206G    0.01898    0.007102     0.0168       4        320:
15%|#5         | 6/40 [00:01<00:06,  5.40it/s]
   432/499      0.206G    0.02002    0.007064    0.01738       2        320:
15%|#5         | 6/40 [00:01<00:06,  5.40it/s]
   432/499      0.206G    0.02002    0.007064    0.01738       2        320:
18%|#7         | 7/40 [00:01<00:06,  5.38it/s]
   432/499      0.206G    0.02034    0.007475    0.01725       2        320:
18%|#7         | 7/40 [00:01<00:06,  5.38it/s]
   432/499      0.206G    0.02034    0.007475    0.01725       2        320:
20%|##         | 8/40 [00:01<00:05,  5.34it/s]
   432/499      0.206G    0.02074    0.007823    0.01851       3        320:
20%|##         | 8/40 [00:01<00:05,  5.34it/s]
   432/499      0.206G    0.02074    0.007823    0.01851       3        320:
22%|##2        | 9/40 [00:01<00:05,  5.34it/s]
   432/499      0.206G    0.01981    0.007699    0.01816       2        320:
22%|##2        | 9/40 [00:01<00:05,  5.34it/s]
   432/499      0.206G    0.01981    0.007699    0.01816       2        320:
25%|##5        | 10/40 [00:01<00:05,  5.32it/s]
   432/499      0.206G    0.01928    0.007711    0.01775       2        320:
25%|##5        | 10/40 [00:02<00:05,  5.32it/s]
   432/499      0.206G    0.01928    0.007711    0.01775       2        320:
28%|##7        | 11/40 [00:02<00:05,  5.46it/s]
   432/499      0.206G    0.01961    0.008313    0.01775       4        320:
28%|##7        | 11/40 [00:02<00:05,  5.46it/s]
   432/499      0.206G    0.01961    0.008313    0.01775       4        320:
30%|###        | 12/40 [00:02<00:05,  5.42it/s]
   432/499      0.206G     0.019    0.008134    0.01783       2        320:
30%|###        | 12/40 [00:02<00:05,  5.42it/s]
   432/499      0.206G     0.019    0.008134    0.01783       2        320:
32%|###2       | 13/40 [00:02<00:04,  5.52it/s]
   432/499      0.206G    0.02184    0.007917    0.01791       2        320:
32%|###2       | 13/40 [00:02<00:04,  5.52it/s]
   432/499      0.206G    0.02184    0.007917    0.01791       2        320:
35%|###5       | 14/40 [00:02<00:04,  5.59it/s]
   432/499      0.206G    0.02336    0.007892     0.0178       2        320:
35%|###5       | 14/40 [00:02<00:04,  5.59it/s]
   432/499      0.206G    0.02336    0.007892     0.0178       2        320:
38%|###7       | 15/40 [00:02<00:04,  5.51it/s]
   432/499      0.206G    0.02296    0.007878    0.01782       2        320:
38%|###7       | 15/40 [00:02<00:04,  5.51it/s]
   432/499      0.206G    0.02296    0.007878    0.01782       2        320:
40%|####       | 16/40 [00:02<00:04,  5.59it/s]
   432/499      0.206G    0.02238    0.007852    0.01778       2        320:
40%|####       | 16/40 [00:03<00:04,  5.59it/s]
   432/499      0.206G    0.02238    0.007852    0.01778       2        320:
42%|####2      | 17/40 [00:03<00:04,  5.66it/s]
```

```
     432/499       0.206G     0.02207   0.008234      0.01793          4          320:
42%|####2      | 17/40 [00:03<00:04,  5.66it/s]
     432/499       0.206G     0.02207   0.008234      0.01793          4          320:
45%|####5      | 18/40 [00:03<00:03,  5.70it/s]
     432/499       0.206G     0.02289   0.008807      0.01846          3          320:
45%|####5      | 18/40 [00:03<00:03,  5.70it/s]
     432/499       0.206G     0.02289   0.008807      0.01846          3          320:
48%|####7      | 19/40 [00:03<00:03,  5.35it/s]
     432/499       0.206G     0.02352   0.009167      0.01854          4          320:
48%|####7      | 19/40 [00:03<00:03,  5.35it/s]
     432/499       0.206G     0.02352   0.009167      0.01854          4          320:
50%|#####      | 20/40 [00:03<00:03,  5.44it/s]
     432/499       0.206G     0.02307   0.009014      0.01854          1          320:
50%|#####      | 20/40 [00:03<00:03,  5.44it/s]
     432/499       0.206G     0.02307   0.009014      0.01854          1          320:
52%|#####2     | 21/40 [00:03<00:03,  5.49it/s]
     432/499       0.206G      0.0228   0.009381      0.01866          4          320:
52%|#####2     | 21/40 [00:04<00:03,  5.49it/s]
     432/499       0.206G      0.0228   0.009381      0.01866          4          320:
55%|#####5     | 22/40 [00:04<00:03,  5.34it/s]
     432/499       0.206G     0.02255   0.009306      0.01859          2          320:
55%|#####5     | 22/40 [00:04<00:03,  5.34it/s]
     432/499       0.206G     0.02255   0.009306      0.01859          2          320:
57%|#####7     | 23/40 [00:04<00:03,  5.34it/s]
     432/499       0.206G     0.02241   0.009083       0.0185          1          320:
57%|#####7     | 23/40 [00:04<00:03,  5.34it/s]
     432/499       0.206G     0.02241   0.009083       0.0185          1          320:
60%|######     | 24/40 [00:04<00:02,  5.47it/s]
     432/499       0.206G     0.02201   0.008899      0.01851          1          320:
60%|######     | 24/40 [00:04<00:02,  5.47it/s]
     432/499       0.206G     0.02201   0.008899      0.01851          1          320:
62%|######2    | 25/40 [00:04<00:02,  5.55it/s]
     432/499       0.206G     0.02146   0.008691       0.0183          1          320:
62%|######2    | 25/40 [00:04<00:02,  5.55it/s]
     432/499       0.206G     0.02146   0.008691       0.0183          1          320:
65%|######5    | 26/40 [00:04<00:02,  5.48it/s]
     432/499       0.206G     0.02214   0.008834      0.01841          4          320:
65%|######5    | 26/40 [00:04<00:02,  5.48it/s]
     432/499       0.206G     0.02214   0.008834      0.01841          4          320:
68%|######7    | 27/40 [00:04<00:02,  5.58it/s]
     432/499       0.206G     0.02213   0.008791      0.01842          2          320:
68%|######7    | 27/40 [00:05<00:02,  5.58it/s]
     432/499       0.206G     0.02213   0.008791      0.01842          2          320:
70%|#######    | 28/40 [00:05<00:02,  5.61it/s]
     432/499       0.206G     0.02183   0.008809      0.01902          4          320:
70%|#######    | 28/40 [00:05<00:02,  5.61it/s]
     432/499       0.206G     0.02183   0.008809      0.01902          4          320:
72%|#######2   | 29/40 [00:05<00:01,  5.67it/s]
```

```
    432/499      0.206G       0.0214    0.008754      0.01889         2        320:
72%|#######2   | 29/40 [00:05<00:01,  5.67it/s]
    432/499      0.206G       0.0214    0.008754      0.01889         2        320:
75%|#######5   | 30/40 [00:05<00:01,  5.71it/s]
    432/499      0.206G      0.02096    0.008589      0.01881         1        320:
75%|#######5   | 30/40 [00:05<00:01,  5.71it/s]
    432/499      0.206G      0.02096    0.008589      0.01881         1        320:
78%|#######7   | 31/40 [00:05<00:01,  5.74it/s]
    432/499      0.206G      0.02053    0.008463      0.01882         1        320:
78%|#######7   | 31/40 [00:05<00:01,  5.74it/s]
    432/499      0.206G      0.02053    0.008463      0.01882         1        320:
80%|########   | 32/40 [00:05<00:01,  5.77it/s]
    432/499      0.206G      0.02082    0.008635      0.01895         4        320:
80%|########   | 32/40 [00:05<00:01,  5.77it/s]
    432/499      0.206G      0.02082    0.008635      0.01895         4        320:
82%|########2  | 33/40 [00:05<00:01,  5.78it/s]
    432/499      0.206G      0.02173    0.008526       0.0189         2        320:
82%|########2  | 33/40 [00:06<00:01,  5.78it/s]
    432/499      0.206G      0.02173    0.008526       0.0189         2        320:
85%|########5  | 34/40 [00:06<00:01,  5.64it/s]
    432/499      0.206G      0.02213    0.008582      0.01921         2        320:
85%|########5  | 34/40 [00:06<00:01,  5.64it/s]
    432/499      0.206G      0.02213    0.008582      0.01921         2        320:
88%|########7  | 35/40 [00:06<00:00,  5.54it/s]
    432/499      0.206G       0.0218    0.008574      0.01908         2        320:
88%|########7  | 35/40 [00:06<00:00,  5.54it/s]
    432/499      0.206G       0.0218    0.008574      0.01908         2        320:
90%|######### | 36/40 [00:06<00:00,  5.62it/s]
    432/499      0.206G      0.02182    0.008648      0.01914         4        320:
90%|######### | 36/40 [00:06<00:00,  5.62it/s]
    432/499      0.206G      0.02182    0.008648      0.01914         4        320:
92%|#########2| 37/40 [00:06<00:00,  5.37it/s]
    432/499      0.206G      0.02153    0.008518      0.01902         1        320:
92%|#########2| 37/40 [00:06<00:00,  5.37it/s]
    432/499      0.206G      0.02153    0.008518      0.01902         1        320:
95%|#########5| 38/40 [00:06<00:00,  5.50it/s]
    432/499      0.206G      0.02134    0.008473      0.01898         2        320:
95%|#########5| 38/40 [00:07<00:00,  5.50it/s]
    432/499      0.206G      0.02134    0.008473      0.01898         2        320:
98%|#########7| 39/40 [00:07<00:00,  5.59it/s]
    432/499      0.206G      0.02139    0.008574      0.01919         4        320:
98%|#########7| 39/40 [00:07<00:00,  5.59it/s]
    432/499      0.206G      0.02139    0.008574      0.01919         4        320:
100%|##########| 40/40 [00:07<00:00,  5.49it/s]
    432/499      0.206G      0.02139    0.008574      0.01919         4        320:
100%|##########| 40/40 [00:07<00:00,  5.51it/s]

                 Class      Images  Instances           P          R      mAP50
```

```
mAP50-95:    0%|              | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   10%|#            | 2/20 [00:00<00:01, 14.22it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   20%|##           | 4/20 [00:00<00:00, 16.31it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   30%|###          | 6/20 [00:00<00:00, 17.19it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   40%|####         | 8/20 [00:00<00:00, 17.42it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   50%|#####        | 10/20 [00:00<00:00, 17.72it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   60%|######       | 12/20 [00:00<00:00, 17.88it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   70%|#######      | 14/20 [00:00<00:00, 18.01it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   80%|########     | 16/20 [00:00<00:00, 18.10it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   90%|######### | 18/20 [00:01<00:00, 18.13it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  100%|##########| 20/20 [00:01<00:00, 18.17it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  100%|##########| 20/20 [00:01<00:00, 17.71it/s]
                all         40         40      0.982      0.987      0.995
0.815

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
     433/499     0.206G    0.01083   0.005859    0.01751          2        320:
0%|          | 0/40 [00:00<?, ?it/s]
     433/499     0.206G    0.01083   0.005859    0.01751          2        320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
     433/499     0.206G   0.009946   0.004839    0.01738          1        320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
     433/499     0.206G   0.009946   0.004839    0.01738          1        320:
5%|5         | 2/40 [00:00<00:06,  6.15it/s]
     433/499     0.206G    0.01121     0.0046    0.01873          1        320:
5%|5         | 2/40 [00:00<00:06,  6.15it/s]
     433/499     0.206G    0.01121     0.0046    0.01873          1        320:
8%|7         | 3/40 [00:00<00:06,  5.71it/s]
     433/499     0.206G    0.01084   0.004769     0.0181          2        320:
8%|7         | 3/40 [00:00<00:06,  5.71it/s]
     433/499     0.206G    0.01084   0.004769     0.0181          2        320:
10%|#         | 4/40 [00:00<00:06,  5.75it/s]
     433/499     0.206G    0.01802   0.005279    0.01841          2        320:
10%|#         | 4/40 [00:00<00:06,  5.75it/s]
     433/499     0.206G    0.01802   0.005279    0.01841          2        320:
```

```
12%|#2        | 5/40 [00:00<00:06,  5.42it/s]
     433/499    0.206G      0.0164    0.004843   0.01825        1        320:
12%|#2        | 5/40 [00:01<00:06,  5.42it/s]
     433/499    0.206G      0.0164    0.004843   0.01825        1        320:
15%|#5        | 6/40 [00:01<00:06,  5.52it/s]
     433/499    0.206G      0.01828    0.00639    0.01825        4        320:
15%|#5        | 6/40 [00:01<00:06,  5.52it/s]
     433/499    0.206G      0.01828    0.00639    0.01825        4        320:
18%|#7        | 7/40 [00:01<00:05,  5.61it/s]
     433/499    0.206G      0.01707    0.006756   0.01851        2        320:
18%|#7        | 7/40 [00:01<00:05,  5.61it/s]
     433/499    0.206G      0.01707    0.006756   0.01851        2        320:
20%|##        | 8/40 [00:01<00:05,  5.63it/s]
     433/499    0.206G      0.01671    0.006634   0.01807        1        320:
20%|##        | 8/40 [00:01<00:05,  5.63it/s]
     433/499    0.206G      0.01671    0.006634   0.01807        1        320:
22%|##2       | 9/40 [00:01<00:05,  5.72it/s]
     433/499    0.206G      0.01788    0.007027   0.01794        4        320:
22%|##2       | 9/40 [00:01<00:05,  5.72it/s]
     433/499    0.206G      0.01788    0.007027   0.01794        4        320:
25%|##5       | 10/40 [00:01<00:05,  5.45it/s]
     433/499    0.206G      0.01741    0.007123    0.0176        2        320:
25%|##5       | 10/40 [00:01<00:05,  5.45it/s]
     433/499    0.206G      0.01741    0.007123    0.0176        2        320:
28%|##7       | 11/40 [00:01<00:05,  5.71it/s]
     433/499    0.206G      0.0168     0.007004   0.01728        2        320:
28%|##7       | 11/40 [00:02<00:05,  5.71it/s]
     433/499    0.206G      0.0168     0.007004   0.01728        2        320:
30%|###       | 12/40 [00:02<00:04,  5.72it/s]
     433/499    0.206G      0.0173     0.006737   0.01738        1        320:
30%|###       | 12/40 [00:02<00:04,  5.72it/s]
     433/499    0.206G      0.0173     0.006737   0.01738        1        320:
32%|###2      | 13/40 [00:02<00:04,  5.75it/s]
     433/499    0.206G      0.01765    0.006771   0.01848        2        320:
32%|###2      | 13/40 [00:02<00:04,  5.75it/s]
     433/499    0.206G      0.01765    0.006771   0.01848        2        320:
35%|###5      | 14/40 [00:02<00:04,  5.77it/s]
     433/499    0.206G      0.01707    0.006682   0.01809        2        320:
35%|###5      | 14/40 [00:02<00:04,  5.77it/s]
     433/499    0.206G      0.01707    0.006682   0.01809        2        320:
38%|###7      | 15/40 [00:02<00:04,  5.78it/s]
     433/499    0.206G      0.01663    0.006626   0.01804        2        320:
38%|###7      | 15/40 [00:02<00:04,  5.78it/s]
     433/499    0.206G      0.01663    0.006626   0.01804        2        320:
40%|####      | 16/40 [00:02<00:04,  5.79it/s]
     433/499    0.206G      0.017      0.006789   0.01779        1        320:
40%|####      | 16/40 [00:02<00:04,  5.79it/s]
     433/499    0.206G      0.017      0.006789   0.01779        1        320:
```

```
42%|####2       | 17/40 [00:02<00:04,  5.65it/s]
     433/499      0.206G    0.01658   0.006564    0.01766         1         320:
42%|####2       | 17/40 [00:03<00:04,  5.65it/s]
     433/499      0.206G    0.01658   0.006564    0.01766         1         320:
45%|####5       | 18/40 [00:03<00:03,  5.68it/s]
     433/499      0.206G    0.01743   0.006896    0.01804         4         320:
45%|####5       | 18/40 [00:03<00:03,  5.68it/s]
     433/499      0.206G    0.01743   0.006896    0.01804         4         320:
48%|####7       | 19/40 [00:03<00:03,  5.72it/s]
     433/499      0.206G    0.01919   0.006893    0.01819         2         320:
48%|####7       | 19/40 [00:03<00:03,  5.72it/s]
     433/499      0.206G    0.01919   0.006893    0.01819         2         320:
50%|#####       | 20/40 [00:03<00:03,  5.30it/s]
     433/499      0.206G     0.0195   0.007039    0.01881         2         320:
50%|#####       | 20/40 [00:03<00:03,  5.30it/s]
     433/499      0.206G     0.0195   0.007039    0.01881         2         320:
52%|#####2      | 21/40 [00:03<00:03,  5.44it/s]
     433/499      0.206G    0.02088   0.007275    0.01868         2         320:
52%|#####2      | 21/40 [00:03<00:03,  5.44it/s]
     433/499      0.206G    0.02088   0.007275    0.01868         2         320:
55%|#####5      | 22/40 [00:03<00:03,  5.55it/s]
     433/499      0.206G    0.02231   0.007147     0.0186         2         320:
55%|#####5      | 22/40 [00:04<00:03,  5.55it/s]
     433/499      0.206G    0.02231   0.007147     0.0186         2         320:
57%|#####7      | 23/40 [00:04<00:03,  5.24it/s]
     433/499      0.206G     0.0222   0.007473     0.0188         4         320:
57%|#####7      | 23/40 [00:04<00:03,  5.24it/s]
     433/499      0.206G     0.0222   0.007473     0.0188         4         320:
60%|######      | 24/40 [00:04<00:03,  5.22it/s]
     433/499      0.206G    0.02169   0.007467    0.01862         2         320:
60%|######      | 24/40 [00:04<00:03,  5.22it/s]
     433/499      0.206G    0.02169   0.007467    0.01862         2         320:
62%|######2     | 25/40 [00:04<00:02,  5.13it/s]
     433/499      0.206G    0.02238   0.007735    0.01869         4         320:
62%|######2     | 25/40 [00:04<00:02,  5.13it/s]
     433/499      0.206G    0.02238   0.007735    0.01869         4         320:
65%|######5     | 26/40 [00:04<00:02,  5.05it/s]
     433/499      0.206G    0.02205   0.007737    0.01859         2         320:
65%|######5     | 26/40 [00:04<00:02,  5.05it/s]
     433/499      0.206G    0.02205   0.007737    0.01859         2         320:
68%|######7     | 27/40 [00:04<00:02,  4.79it/s]
     433/499      0.206G    0.02173   0.007586    0.01853         1         320:
68%|######7     | 27/40 [00:05<00:02,  4.79it/s]
     433/499      0.206G    0.02173   0.007586    0.01853         1         320:
70%|#######     | 28/40 [00:05<00:02,  4.61it/s]
     433/499      0.206G    0.02143   0.007442    0.01856         1         320:
70%|#######     | 28/40 [00:05<00:02,  4.61it/s]
     433/499      0.206G    0.02143   0.007442    0.01856         1         320:
```

```
72%|#######2   | 29/40 [00:05<00:02,  4.81it/s]
    433/499      0.206G     0.02113    0.007282     0.0184         1        320:
72%|#######2   | 29/40 [00:05<00:02,  4.81it/s]
    433/499      0.206G     0.02113    0.007282     0.0184         1        320:
75%|#######5   | 30/40 [00:05<00:02,  4.96it/s]
    433/499      0.206G     0.02115    0.007451    0.01875         3        320:
75%|#######5   | 30/40 [00:05<00:02,  4.96it/s]
    433/499      0.206G     0.02115    0.007451    0.01875         3        320:
78%|#######7   | 31/40 [00:05<00:01,  4.71it/s]
    433/499      0.206G     0.02082    0.007392    0.01872         2        320:
78%|#######7   | 31/40 [00:06<00:01,  4.71it/s]
    433/499      0.206G     0.02082    0.007392    0.01872         2        320:
80%|########   | 32/40 [00:06<00:01,  4.77it/s]
    433/499      0.206G     0.02041    0.007289    0.01864         1        320:
80%|########   | 32/40 [00:06<00:01,  4.77it/s]
    433/499      0.206G     0.02041    0.007289    0.01864         1        320:
82%|########2  | 33/40 [00:06<00:01,  4.93it/s]
    433/499      0.206G     0.02043    0.007367    0.01881         4        320:
82%|########2  | 33/40 [00:06<00:01,  4.93it/s]
    433/499      0.206G     0.02043    0.007367    0.01881         4        320:
85%|########5  | 34/40 [00:06<00:01,  4.80it/s]
    433/499      0.206G     0.02138    0.007435    0.01877         2        320:
85%|########5  | 34/40 [00:06<00:01,  4.80it/s]
    433/499      0.206G     0.02138    0.007435    0.01877         2        320:
88%|########7  | 35/40 [00:06<00:01,  4.83it/s]
    433/499      0.206G     0.02155    0.007716    0.01873         2        320:
88%|########7  | 35/40 [00:06<00:01,  4.83it/s]
    433/499      0.206G     0.02155    0.007716    0.01873         2        320:
90%|######### | 36/40 [00:06<00:00,  4.85it/s]
    433/499      0.206G     0.02156    0.007652    0.01873         1        320:
90%|######### | 36/40 [00:07<00:00,  4.85it/s]
    433/499      0.206G     0.02156    0.007652    0.01873         1        320:
92%|#########2| 37/40 [00:07<00:00,  4.98it/s]
    433/499      0.206G     0.02133    0.007594     0.0187         2        320:
92%|#########2| 37/40 [00:07<00:00,  4.98it/s]
    433/499      0.206G     0.02133    0.007594     0.0187         2        320:
95%|#########5| 38/40 [00:07<00:00,  5.21it/s]
    433/499      0.206G     0.02126    0.007765    0.01886         4        320:
95%|#########5| 38/40 [00:07<00:00,  5.21it/s]
    433/499      0.206G     0.02126    0.007765    0.01886         4        320:
98%|#########7| 39/40 [00:07<00:00,  5.22it/s]
    433/499      0.206G     0.02106    0.007712    0.01874         2        320:
98%|#########7| 39/40 [00:07<00:00,  5.22it/s]
    433/499      0.206G     0.02106    0.007712    0.01874         2        320:
100%|##########| 40/40 [00:07<00:00,  5.38it/s]
    433/499      0.206G     0.02106    0.007712    0.01874         2        320:
100%|##########| 40/40 [00:07<00:00,  5.30it/s]
```

```
              Class      Images  Instances          P          R      mAP50
mAP50-95:    0%|              | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:   10%|#             | 2/20 [00:00<00:01, 16.00it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:   20%|##            | 4/20 [00:00<00:01, 15.93it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:   30%|###           | 6/20 [00:00<00:00, 17.08it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:   40%|####          | 8/20 [00:00<00:00, 17.53it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:   50%|#####         | 10/20 [00:00<00:00, 17.80it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:   60%|######        | 12/20 [00:00<00:00, 17.96it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:   70%|#######       | 14/20 [00:00<00:00, 17.84it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:   85%|########5 | 17/20 [00:00<00:00, 18.46it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:   95%|#########5| 19/20 [00:01<00:00, 17.69it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  100%|##########| 20/20 [00:01<00:00, 17.76it/s]
                all          40         40      0.983      0.986      0.995
0.792


      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|              | 0/40 [00:00<?, ?it/s]
    434/499     0.206G    0.01329   0.004815    0.01074          1       320:
0%|          | 0/40 [00:00<?, ?it/s]
    434/499     0.206G    0.01329   0.004815    0.01074          1       320:
2%|2           | 1/40 [00:00<00:06,  6.40it/s]
    434/499     0.206G    0.01286   0.003885    0.01804          1       320:
2%|2           | 1/40 [00:00<00:06,  6.40it/s]
    434/499     0.206G    0.01286   0.003885    0.01804          1       320:
5%|5           | 2/40 [00:00<00:06,  6.00it/s]
    434/499     0.206G    0.02094   0.004456    0.01892          2       320:
5%|5           | 2/40 [00:00<00:06,  6.00it/s]
    434/499     0.206G    0.02094   0.004456    0.01892          2       320:
8%|7           | 3/40 [00:00<00:06,  5.92it/s]
    434/499     0.206G    0.02404   0.005987    0.02477          2       320:
8%|7           | 3/40 [00:00<00:06,  5.92it/s]
    434/499     0.206G    0.02404   0.005987    0.02477          2       320:
10%|#          | 4/40 [00:00<00:06,  5.67it/s]
    434/499     0.206G     0.0226   0.006587     0.0252          2       320:
10%|#          | 4/40 [00:00<00:06,  5.67it/s]
    434/499     0.206G     0.0226   0.006587     0.0252          2       320:
12%|#2         | 5/40 [00:00<00:06,  5.70it/s]
```

```
   434/499      0.206G     0.02178    0.007788      0.02624            4          320:
12%|#2         | 5/40 [00:01<00:06,  5.70it/s]
   434/499      0.206G     0.02178    0.007788      0.02624            4          320:
15%|#5         | 6/40 [00:01<00:06,  5.57it/s]
   434/499      0.206G     0.02453    0.008929      0.02677            4          320:
15%|#5         | 6/40 [00:01<00:06,  5.57it/s]
   434/499      0.206G     0.02453    0.008929      0.02677            4          320:
18%|#7         | 7/40 [00:01<00:05,  5.60it/s]
   434/499      0.206G     0.02291    0.009144      0.02534            1          320:
18%|#7         | 7/40 [00:01<00:05,  5.60it/s]
   434/499      0.206G     0.02291    0.009144      0.02534            1          320:
20%|##         | 8/40 [00:01<00:05,  5.55it/s]
   434/499      0.206G     0.02097    0.008413      0.02403            1          320:
20%|##         | 8/40 [00:01<00:05,  5.55it/s]
   434/499      0.206G     0.02097    0.008413      0.02403            1          320:
22%|##2        | 9/40 [00:01<00:05,  5.63it/s]
   434/499      0.206G     0.02051    0.008001      0.02347            1          320:
22%|##2        | 9/40 [00:01<00:05,  5.63it/s]
   434/499      0.206G     0.02051    0.008001      0.02347            1          320:
25%|##5        | 10/40 [00:01<00:05,  5.69it/s]
   434/499      0.206G     0.01994    0.008373      0.02362            4          320:
25%|##5        | 10/40 [00:01<00:05,  5.69it/s]
   434/499      0.206G     0.01994    0.008373      0.02362            4          320:
28%|##7        | 11/40 [00:01<00:05,  5.56it/s]
   434/499      0.206G     0.02033    0.008397      0.02313            2          320:
28%|##7        | 11/40 [00:02<00:05,  5.56it/s]
   434/499      0.206G     0.02033    0.008397      0.02313            2          320:
30%|###        | 12/40 [00:02<00:05,  5.49it/s]
   434/499      0.206G     0.02278    0.008356      0.02258            2          320:
30%|###        | 12/40 [00:02<00:05,  5.49it/s]
   434/499      0.206G     0.02278    0.008356      0.02258            2          320:
32%|###2       | 13/40 [00:02<00:04,  5.44it/s]
   434/499      0.206G     0.02246    0.008307      0.02239            2          320:
32%|###2       | 13/40 [00:02<00:04,  5.44it/s]
   434/499      0.206G     0.02246    0.008307      0.02239            2          320:
35%|###5       | 14/40 [00:02<00:04,  5.52it/s]
   434/499      0.206G     0.02403    0.008378      0.02194            3          320:
35%|###5       | 14/40 [00:02<00:04,  5.52it/s]
   434/499      0.206G     0.02403    0.008378      0.02194            3          320:
38%|###7       | 15/40 [00:02<00:04,  5.46it/s]
   434/499      0.206G     0.02339    0.008244      0.02176            2          320:
38%|###7       | 15/40 [00:02<00:04,  5.46it/s]
   434/499      0.206G     0.02339    0.008244      0.02176            2          320:
40%|####       | 16/40 [00:02<00:04,  5.42it/s]
   434/499      0.206G     0.02292    0.008645      0.02216            4          320:
40%|####       | 16/40 [00:03<00:04,  5.42it/s]
   434/499      0.206G     0.02292    0.008645      0.02216            4          320:
42%|####2      | 17/40 [00:03<00:04,  5.52it/s]
```

```
      434/499        0.206G        0.0225    0.008958        0.02214            4              320:
42%|####2      | 17/40 [00:03<00:04,  5.52it/s]
      434/499        0.206G        0.0225    0.008958        0.02214            4              320:
45%|####5      | 18/40 [00:03<00:03,  5.61it/s]
      434/499        0.206G       0.02175     0.00867         0.0218            1              320:
45%|####5      | 18/40 [00:03<00:03,  5.61it/s]
      434/499        0.206G       0.02175     0.00867         0.0218            1              320:
48%|####7      | 19/40 [00:03<00:03,  5.67it/s]
      434/499        0.206G       0.02307     0.00851        0.02154            2              320:
48%|####7      | 19/40 [00:03<00:03,  5.67it/s]
      434/499        0.206G       0.02307     0.00851        0.02154            2              320:
50%|#####      | 20/40 [00:03<00:03,  5.55it/s]
      434/499        0.206G       0.02263    0.008268        0.02164            1              320:
50%|#####      | 20/40 [00:03<00:03,  5.55it/s]
      434/499        0.206G       0.02263    0.008268        0.02164            1              320:
52%|#####2     | 21/40 [00:03<00:03,  5.48it/s]
      434/499        0.206G       0.02224    0.008128        0.02132            1              320:
52%|#####2     | 21/40 [00:03<00:03,  5.48it/s]
      434/499        0.206G       0.02224    0.008128        0.02132            1              320:
55%|#####5     | 22/40 [00:03<00:03,  5.57it/s]
      434/499        0.206G        0.0224    0.008349        0.02148            4              320:
55%|#####5     | 22/40 [00:04<00:03,  5.57it/s]
      434/499        0.206G        0.0224    0.008349        0.02148            4              320:
57%|#####7     | 23/40 [00:04<00:03,  5.50it/s]
      434/499        0.206G       0.02326    0.008352        0.02125            2              320:
57%|#####7     | 23/40 [00:04<00:03,  5.50it/s]
      434/499        0.206G       0.02326    0.008352        0.02125            2              320:
60%|######     | 24/40 [00:04<00:02,  5.59it/s]
      434/499        0.206G       0.02276    0.008407         0.0211            4              320:
60%|######     | 24/40 [00:04<00:02,  5.59it/s]
      434/499        0.206G       0.02276    0.008407         0.0211            4              320:
62%|######2    | 25/40 [00:04<00:02,  5.66it/s]
      434/499        0.206G       0.02311    0.008927        0.02126            4              320:
62%|######2    | 25/40 [00:04<00:02,  5.66it/s]
      434/499        0.206G       0.02311    0.008927        0.02126            4              320:
65%|######5    | 26/40 [00:04<00:02,  5.68it/s]
      434/499        0.206G       0.02253    0.008807        0.02112            2              320:
65%|######5    | 26/40 [00:04<00:02,  5.68it/s]
      434/499        0.206G       0.02253    0.008807        0.02112            2              320:
68%|######7    | 27/40 [00:04<00:02,  5.72it/s]
      434/499        0.206G       0.02244    0.009021        0.02122            4              320:
68%|######7    | 27/40 [00:05<00:02,  5.72it/s]
      434/499        0.206G       0.02244    0.009021        0.02122            4              320:
70%|#######    | 28/40 [00:05<00:02,  5.60it/s]
      434/499        0.206G       0.02216    0.008826        0.02094            1              320:
70%|#######    | 28/40 [00:05<00:02,  5.60it/s]
      434/499        0.206G       0.02216    0.008826        0.02094            1              320:
72%|#######2   | 29/40 [00:05<00:01,  5.64it/s]
```

```
    434/499      0.206G      0.02239     0.008992      0.02162            2             320:
72%|#######2  | 29/40 [00:05<00:01,  5.64it/s]
    434/499      0.206G      0.02239     0.008992      0.02162            2             320:
75%|#######5  | 30/40 [00:05<00:01,  5.40it/s]
    434/499      0.206G      0.02197     0.008867       0.0214            1             320:
75%|#######5  | 30/40 [00:05<00:01,  5.40it/s]
    434/499      0.206G      0.02197     0.008867       0.0214            1             320:
78%|#######7  | 31/40 [00:05<00:01,  5.66it/s]
    434/499      0.206G      0.02164     0.008772      0.02119            1             320:
78%|#######7  | 31/40 [00:05<00:01,  5.66it/s]
    434/499      0.206G      0.02164     0.008772      0.02119            1             320:
80%|########  | 32/40 [00:05<00:01,  5.70it/s]
    434/499      0.206G      0.02124     0.008582      0.02096            1             320:
80%|########  | 32/40 [00:05<00:01,  5.70it/s]
    434/499      0.206G      0.02124     0.008582      0.02096            1             320:
82%|########2 | 33/40 [00:05<00:01,  5.73it/s]
    434/499      0.206G      0.02202     0.008537      0.02104            2             320:
82%|########2 | 33/40 [00:06<00:01,  5.73it/s]
    434/499      0.206G      0.02202     0.008537      0.02104            2             320:
85%|########5 | 34/40 [00:06<00:01,  5.46it/s]
    434/499      0.206G      0.02176     0.008509      0.02083            2             320:
85%|########5 | 34/40 [00:06<00:01,  5.46it/s]
    434/499      0.206G      0.02176     0.008509      0.02083            2             320:
88%|########7 | 35/40 [00:06<00:00,  5.55it/s]
    434/499      0.206G      0.02213     0.008494      0.02086            4             320:
88%|########7 | 35/40 [00:06<00:00,  5.55it/s]
    434/499      0.206G      0.02213     0.008494      0.02086            4             320:
90%|######### | 36/40 [00:06<00:00,  5.34it/s]
    434/499      0.206G      0.02187      0.00835      0.02066            1             320:
90%|######### | 36/40 [00:06<00:00,  5.34it/s]
    434/499      0.206G      0.02187      0.00835      0.02066            1             320:
92%|#########2| 37/40 [00:06<00:00,  5.46it/s]
    434/499      0.206G      0.02163     0.008403      0.02051            2             320:
92%|#########2| 37/40 [00:06<00:00,  5.46it/s]
    434/499      0.206G      0.02163     0.008403      0.02051            2             320:
95%|#########5| 38/40 [00:06<00:00,  5.56it/s]
    434/499      0.206G      0.02148     0.008371      0.02048            2             320:
95%|#########5| 38/40 [00:06<00:00,  5.56it/s]
    434/499      0.206G      0.02148     0.008371      0.02048            2             320:
98%|#########7| 39/40 [00:06<00:00,  5.49it/s]
    434/499      0.206G      0.02153     0.008464      0.02066            2             320:
98%|#########7| 39/40 [00:07<00:00,  5.49it/s]
    434/499      0.206G      0.02153     0.008464      0.02066            2             320:
100%|##########| 40/40 [00:07<00:00,  5.36it/s]
    434/499      0.206G      0.02153     0.008464      0.02066            2             320:
100%|##########| 40/40 [00:07<00:00,  5.56it/s]

                Class      Images  Instances          P          R       mAP50
```

```
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:00, 18.28it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:00, 16.87it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 17.49it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 16.85it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####        | 10/20 [00:00<00:00, 17.25it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######       | 12/20 [00:00<00:00, 17.58it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######      | 14/20 [00:00<00:00, 17.81it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########     | 16/20 [00:00<00:00, 17.95it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.86it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 18.11it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.72it/s]
                 all         40         40      0.983      0.986      0.995
0.792

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
    435/499     0.206G   0.006807    0.00247    0.01523          1        320:
0%|          | 0/40 [00:00<?, ?it/s]
    435/499     0.206G   0.006807    0.00247    0.01523          1        320:
2%|2          | 1/40 [00:00<00:06,  6.32it/s]
    435/499     0.206G    0.01457   0.004302     0.0118          2        320:
2%|2          | 1/40 [00:00<00:06,  6.32it/s]
    435/499     0.206G    0.01457   0.004302     0.0118          2        320:
5%|5          | 2/40 [00:00<00:05,  6.37it/s]
    435/499     0.206G     0.0136   0.003964    0.01272          1        320:
5%|5          | 2/40 [00:00<00:05,  6.37it/s]
    435/499     0.206G     0.0136   0.003964    0.01272          1        320:
8%|7          | 3/40 [00:00<00:06,  6.10it/s]
    435/499     0.206G     0.0149   0.005692     0.0139          4        320:
8%|7          | 3/40 [00:00<00:06,  6.10it/s]
    435/499     0.206G     0.0149   0.005692     0.0139          4        320:
10%|#          | 4/40 [00:00<00:06,  5.77it/s]
    435/499     0.206G     0.0146   0.005291    0.01481          1        320:
10%|#          | 4/40 [00:00<00:06,  5.77it/s]
    435/499     0.206G     0.0146   0.005291    0.01481          1        320:
```

```
12%|#2         | 5/40 [00:00<00:06,  5.79it/s]
    435/499    0.206G    0.01927    0.006161    0.01719         4        320:
12%|#2         | 5/40 [00:01<00:06,  5.79it/s]
    435/499    0.206G    0.01927    0.006161    0.01719         4        320:
15%|#5         | 6/40 [00:01<00:06,  5.45it/s]
    435/499    0.206G    0.02034    0.007814    0.01782         4        320:
15%|#5         | 6/40 [00:01<00:06,  5.45it/s]
    435/499    0.206G    0.02034    0.007814    0.01782         4        320:
18%|#7         | 7/40 [00:01<00:06,  5.25it/s]
    435/499    0.206G    0.02586    0.007685    0.01761         2        320:
18%|#7         | 7/40 [00:01<00:06,  5.25it/s]
    435/499    0.206G    0.02586    0.007685    0.01761         2        320:
20%|##         | 8/40 [00:01<00:06,  5.14it/s]
    435/499    0.206G    0.02708    0.008102    0.01786         3        320:
20%|##         | 8/40 [00:01<00:06,  5.14it/s]
    435/499    0.206G    0.02708    0.008102    0.01786         3        320:
22%|##2        | 9/40 [00:01<00:05,  5.20it/s]
    435/499    0.206G    0.02517    0.007687    0.01743         1        320:
22%|##2        | 9/40 [00:01<00:05,  5.20it/s]
    435/499    0.206G    0.02517    0.007687    0.01743         1        320:
25%|##5        | 10/40 [00:01<00:05,  5.35it/s]
    435/499    0.206G    0.02361    0.007276     0.0172         1        320:
25%|##5        | 10/40 [00:01<00:05,  5.35it/s]
    435/499    0.206G    0.02361    0.007276     0.0172         1        320:
28%|##7        | 11/40 [00:01<00:05,  5.48it/s]
    435/499    0.206G    0.02418    0.008045    0.01743         4        320:
28%|##7        | 11/40 [00:02<00:05,  5.48it/s]
    435/499    0.206G    0.02418    0.008045    0.01743         4        320:
30%|###        | 12/40 [00:02<00:05,  5.30it/s]
    435/499    0.206G    0.02406    0.008484    0.01801         4        320:
30%|###        | 12/40 [00:02<00:05,  5.30it/s]
    435/499    0.206G    0.02406    0.008484    0.01801         4        320:
32%|###2       | 13/40 [00:02<00:05,  5.17it/s]
    435/499    0.206G    0.02487    0.008789    0.01803         4        320:
32%|###2       | 13/40 [00:02<00:05,  5.17it/s]
    435/499    0.206G    0.02487    0.008789    0.01803         4        320:
35%|###5       | 14/40 [00:02<00:05,  5.09it/s]
    435/499    0.206G     0.0251    0.009393    0.01902         4        320:
35%|###5       | 14/40 [00:02<00:05,  5.09it/s]
    435/499    0.206G     0.0251    0.009393    0.01902         4        320:
38%|###7       | 15/40 [00:02<00:04,  5.03it/s]
    435/499    0.206G    0.02495     0.01004    0.01907         4        320:
38%|###7       | 15/40 [00:03<00:04,  5.03it/s]
    435/499    0.206G    0.02495     0.01004    0.01907         4        320:
40%|####       | 16/40 [00:03<00:04,  4.99it/s]
    435/499    0.206G    0.02398    0.009757    0.01929         1        320:
40%|####       | 16/40 [00:03<00:04,  4.99it/s]
    435/499    0.206G    0.02398    0.009757    0.01929         1        320:
```

```
42%|####2      | 17/40 [00:03<00:04,  4.97it/s]
    435/499      0.206G      0.02589    0.009588    0.02008         3         320:
42%|####2      | 17/40 [00:03<00:04,  4.97it/s]
    435/499      0.206G      0.02589    0.009588    0.02008         3         320:
45%|####5      | 18/40 [00:03<00:04,  4.84it/s]
    435/499      0.206G      0.02595    0.009743    0.02005         3         320:
45%|####5      | 18/40 [00:03<00:04,  4.84it/s]
    435/499      0.206G      0.02595    0.009743    0.02005         3         320:
48%|####7      | 19/40 [00:03<00:04,  4.87it/s]
    435/499      0.206G      0.02654    0.009958     0.0208         4         320:
48%|####7      | 19/40 [00:03<00:04,  4.87it/s]
    435/499      0.206G      0.02654    0.009958     0.0208         4         320:
50%|#####      | 20/40 [00:03<00:04,  4.87it/s]
    435/499      0.206G      0.02603    0.009753    0.02083         2         320:
50%|#####      | 20/40 [00:04<00:04,  4.87it/s]
    435/499      0.206G      0.02603    0.009753    0.02083         2         320:
52%|#####2     | 21/40 [00:04<00:03,  5.00it/s]
    435/499      0.206G      0.02533    0.009657     0.0205         2         320:
52%|#####2     | 21/40 [00:04<00:03,  5.00it/s]
    435/499      0.206G      0.02533    0.009657     0.0205         2         320:
55%|#####5     | 22/40 [00:04<00:03,  4.98it/s]
    435/499      0.206G      0.02499    0.009836    0.02072         4         320:
55%|#####5     | 22/40 [00:04<00:03,  4.98it/s]
    435/499      0.206G      0.02499    0.009836    0.02072         4         320:
57%|#####7     | 23/40 [00:04<00:03,  4.83it/s]
    435/499      0.206G      0.02418    0.009558     0.0208         1         320:
57%|#####7     | 23/40 [00:04<00:03,  4.83it/s]
    435/499      0.206G      0.02418    0.009558     0.0208         1         320:
60%|######     | 24/40 [00:04<00:03,  4.97it/s]
    435/499      0.206G      0.02385    0.009477    0.02104         2         320:
60%|######     | 24/40 [00:04<00:03,  4.97it/s]
    435/499      0.206G      0.02385    0.009477    0.02104         2         320:
62%|######2    | 25/40 [00:04<00:03,  4.83it/s]
    435/499      0.206G      0.02409    0.009477     0.0216         2         320:
62%|######2    | 25/40 [00:05<00:03,  4.83it/s]
    435/499      0.206G      0.02409    0.009477     0.0216         2         320:
65%|######5    | 26/40 [00:05<00:02,  4.85it/s]
    435/499      0.206G      0.02366     0.00936    0.02158         2         320:
65%|######5    | 26/40 [00:05<00:02,  4.85it/s]
    435/499      0.206G      0.02366     0.00936    0.02158         2         320:
68%|######7    | 27/40 [00:05<00:02,  4.98it/s]
    435/499      0.206G      0.02364    0.009261    0.02136         2         320:
68%|######7    | 27/40 [00:05<00:02,  4.98it/s]
    435/499      0.206G      0.02364    0.009261    0.02136         2         320:
70%|#######    | 28/40 [00:05<00:02,  5.09it/s]
    435/499      0.206G      0.02308    0.009088    0.02128         2         320:
70%|#######    | 28/40 [00:05<00:02,  5.09it/s]
    435/499      0.206G      0.02308    0.009088    0.02128         2         320:
```

```
72%|#######2  | 29/40 [00:05<00:02,  5.27it/s]
    435/499     0.206G     0.0227   0.008897    0.02102         1       320:
72%|#######2  | 29/40 [00:05<00:02,  5.27it/s]
    435/499     0.206G     0.0227   0.008897    0.02102         1       320:
75%|#######5  | 30/40 [00:05<00:01,  5.29it/s]
    435/499     0.206G    0.02283   0.008801    0.02094         2       320:
75%|#######5  | 30/40 [00:05<00:01,  5.29it/s]
    435/499     0.206G    0.02283   0.008801    0.02094         2       320:
78%|#######7  | 31/40 [00:05<00:01,  5.42it/s]
    435/499     0.206G    0.02314   0.009131    0.02096         4       320:
78%|#######7  | 31/40 [00:06<00:01,  5.42it/s]
    435/499     0.206G    0.02314   0.009131    0.02096         4       320:
80%|########  | 32/40 [00:06<00:01,  5.39it/s]
    435/499     0.206G    0.02282   0.008938    0.02079         1       320:
80%|########  | 32/40 [00:06<00:01,  5.39it/s]
    435/499     0.206G    0.02282   0.008938    0.02079         1       320:
82%|########2 | 33/40 [00:06<00:01,  5.51it/s]
    435/499     0.206G    0.02261   0.009014    0.02121         4       320:
82%|########2 | 33/40 [00:06<00:01,  5.51it/s]
    435/499     0.206G    0.02261   0.009014    0.02121         4       320:
85%|########5 | 34/40 [00:06<00:01,  5.45it/s]
    435/499     0.206G    0.02292   0.009047    0.02106         2       320:
85%|########5 | 34/40 [00:06<00:01,  5.45it/s]
    435/499     0.206G    0.02292   0.009047    0.02106         2       320:
88%|########7 | 35/40 [00:06<00:00,  5.41it/s]
    435/499     0.206G    0.02302   0.009153    0.02109         4       320:
88%|########7 | 35/40 [00:06<00:00,  5.41it/s]
    435/499     0.206G    0.02302   0.009153    0.02109         4       320:
90%|######### | 36/40 [00:06<00:00,  5.53it/s]
    435/499     0.206G    0.02317   0.009296    0.02109         4       320:
90%|######### | 36/40 [00:07<00:00,  5.53it/s]
    435/499     0.206G    0.02317   0.009296    0.02109         4       320:
92%|#########2| 37/40 [00:07<00:00,  5.45it/s]
    435/499     0.206G    0.02272   0.009215    0.02097         2       320:
92%|#########2| 37/40 [00:07<00:00,  5.45it/s]
    435/499     0.206G    0.02272   0.009215    0.02097         2       320:
95%|#########5| 38/40 [00:07<00:00,  5.56it/s]
    435/499     0.206G    0.02295   0.009358    0.02095         4       320:
95%|#########5| 38/40 [00:07<00:00,  5.56it/s]
    435/499     0.206G    0.02295   0.009358    0.02095         4       320:
98%|#########7| 39/40 [00:07<00:00,  5.63it/s]
    435/499     0.206G    0.02259   0.009216     0.0209         1       320:
98%|#########7| 39/40 [00:07<00:00,  5.63it/s]
    435/499     0.206G    0.02259   0.009216     0.0209         1       320:
100%|##########| 40/40 [00:07<00:00,  5.67it/s]
    435/499     0.206G    0.02259   0.009216     0.0209         1       320:
100%|##########| 40/40 [00:07<00:00,  5.27it/s]
```

```
               Class      Images  Instances          P          R      mAP50
mAP50-95:    0%|              | 0/20 [00:00<?, ?it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:   10%|#            | 2/20 [00:00<00:01, 16.00it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:   20%|##           | 4/20 [00:00<00:00, 17.26it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:   30%|###          | 6/20 [00:00<00:00, 16.66it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:   40%|####         | 8/20 [00:00<00:00, 16.56it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:   50%|#####        | 10/20 [00:00<00:00, 16.88it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:   60%|######       | 12/20 [00:00<00:00, 16.56it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:   70%|#######      | 14/20 [00:00<00:00, 16.35it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:   80%|########     | 16/20 [00:00<00:00, 15.35it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:   90%|######### | 18/20 [00:01<00:00, 16.45it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.81it/s]
                 all         40         40      0.984      0.985      0.995
0.784


     Epoch    GPU_mem    box_loss    obj_loss   cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
    436/499     0.206G    0.006316    0.00251    0.01396          1        320:
0%|          | 0/40 [00:00<?, ?it/s]
    436/499     0.206G    0.006316    0.00251    0.01396          1        320:
2%|2         | 1/40 [00:00<00:05,  6.51it/s]
    436/499     0.206G    0.007145    0.004136     0.015          2        320:
2%|2         | 1/40 [00:00<00:05,  6.51it/s]
    436/499     0.206G    0.007145    0.004136     0.015          2        320:
5%|5         | 2/40 [00:00<00:05,  6.45it/s]
    436/499     0.206G    0.009153    0.005179    0.01638         2        320:
5%|5         | 2/40 [00:00<00:05,  6.45it/s]
    436/499     0.206G    0.009153    0.005179    0.01638         2        320:
8%|7         | 3/40 [00:00<00:06,  5.86it/s]
    436/499     0.206G     0.01037    0.004662    0.01714         1        320:
8%|7         | 3/40 [00:00<00:06,  5.86it/s]
    436/499     0.206G     0.01037    0.004662    0.01714         1        320:
10%|#         | 4/40 [00:00<00:06,  5.82it/s]
    436/499     0.206G     0.01092    0.005182     0.0174         2        320:
10%|#         | 4/40 [00:00<00:06,  5.82it/s]
    436/499     0.206G     0.01092    0.005182     0.0174         2        320:
12%|#2        | 5/40 [00:00<00:05,  6.02it/s]
```

```
    436/499     0.206G    0.01247   0.004991    0.01726          1        320:
12%|#2        | 5/40 [00:01<00:05,  6.02it/s]
    436/499     0.206G    0.01247   0.004991    0.01726          1        320:
15%|#5        | 6/40 [00:01<00:05,  5.95it/s]
    436/499     0.206G    0.01193   0.004969    0.01755          1        320:
15%|#5        | 6/40 [00:01<00:05,  5.95it/s]
    436/499     0.206G    0.01193   0.004969    0.01755          1        320:
18%|#7        | 7/40 [00:01<00:05,  5.89it/s]
    436/499     0.206G    0.01146   0.004671    0.01758          1        320:
18%|#7        | 7/40 [00:01<00:05,  5.89it/s]
    436/499     0.206G    0.01146   0.004671    0.01758          1        320:
20%|##        | 8/40 [00:01<00:05,  6.05it/s]
    436/499     0.206G    0.01397    0.00553    0.01828          2        320:
20%|##        | 8/40 [00:01<00:05,  6.05it/s]
    436/499     0.206G    0.01397    0.00553    0.01828          2        320:
22%|##2       | 9/40 [00:01<00:05,  5.64it/s]
    436/499     0.206G    0.01528   0.005682    0.01832          2        320:
22%|##2       | 9/40 [00:01<00:05,  5.64it/s]
    436/499     0.206G    0.01528   0.005682    0.01832          2        320:
25%|##5       | 10/40 [00:01<00:05,  5.67it/s]
    436/499     0.206G    0.01827   0.005672    0.01898          2        320:
25%|##5       | 10/40 [00:01<00:05,  5.67it/s]
    436/499     0.206G    0.01827   0.005672    0.01898          2        320:
28%|##7       | 11/40 [00:01<00:05,  5.56it/s]
    436/499     0.206G     0.0197   0.006288    0.01935          4        320:
28%|##7       | 11/40 [00:02<00:05,  5.56it/s]
    436/499     0.206G     0.0197   0.006288    0.01935          4        320:
30%|###       | 12/40 [00:02<00:04,  5.63it/s]
    436/499     0.206G    0.01893   0.006061     0.0194          1        320:
30%|###       | 12/40 [00:02<00:04,  5.63it/s]
    436/499     0.206G    0.01893   0.006061     0.0194          1        320:
32%|###2      | 13/40 [00:02<00:04,  5.69it/s]
    436/499     0.206G    0.01998   0.006269     0.0201          4        320:
32%|###2      | 13/40 [00:02<00:04,  5.69it/s]
    436/499     0.206G    0.01998   0.006269     0.0201          4        320:
35%|###5      | 14/40 [00:02<00:04,  5.58it/s]
    436/499     0.206G    0.02038   0.006402    0.02015          2        320:
35%|###5      | 14/40 [00:02<00:04,  5.58it/s]
    436/499     0.206G    0.02038   0.006402    0.02015          2        320:
38%|###7      | 15/40 [00:02<00:04,  5.65it/s]
    436/499     0.206G    0.01985   0.006365    0.02012          2        320:
38%|###7      | 15/40 [00:02<00:04,  5.65it/s]
    436/499     0.206G    0.01985   0.006365    0.02012          2        320:
40%|####      | 16/40 [00:02<00:04,  5.68it/s]
    436/499     0.206G    0.01919   0.006175    0.01986          1        320:
40%|####      | 16/40 [00:02<00:04,  5.68it/s]
    436/499     0.206G    0.01919   0.006175    0.01986          1        320:
42%|####2     | 17/40 [00:02<00:04,  5.72it/s]
```

```
      436/499       0.206G      0.02023    0.006493      0.0198          4          320:
42%|####2     | 17/40 [00:03<00:04,  5.72it/s]
      436/499       0.206G      0.02023    0.006493      0.0198          4          320:
45%|####5     | 18/40 [00:03<00:03,  5.75it/s]
      436/499       0.206G      0.01981    0.006505      0.0197          2          320:
45%|####5     | 18/40 [00:03<00:03,  5.75it/s]
      436/499       0.206G      0.01981    0.006505      0.0197          2          320:
48%|####7     | 19/40 [00:03<00:03,  5.75it/s]
      436/499       0.206G       0.0221    0.006477     0.01959          2          320:
48%|####7     | 19/40 [00:03<00:03,  5.75it/s]
      436/499       0.206G       0.0221    0.006477     0.01959          2          320:
50%|#####     | 20/40 [00:03<00:03,  5.77it/s]
      436/499       0.206G      0.02215    0.006849      0.0195          4          320:
50%|#####     | 20/40 [00:03<00:03,  5.77it/s]
      436/499       0.206G      0.02215    0.006849      0.0195          4          320:
52%|#####2    | 21/40 [00:03<00:03,  5.78it/s]
      436/499       0.206G      0.02178    0.007073     0.01945          2          320:
52%|#####2    | 21/40 [00:03<00:03,  5.78it/s]
      436/499       0.206G      0.02178    0.007073     0.01945          2          320:
55%|#####5    | 22/40 [00:03<00:03,  5.77it/s]
      436/499       0.206G      0.02153    0.007403     0.01961          4          320:
55%|#####5    | 22/40 [00:04<00:03,  5.77it/s]
      436/499       0.206G      0.02153    0.007403     0.01961          4          320:
57%|#####7    | 23/40 [00:04<00:03,  5.49it/s]
      436/499       0.206G      0.02309    0.007402     0.01953          2          320:
57%|#####7    | 23/40 [00:04<00:03,  5.49it/s]
      436/499       0.206G      0.02309    0.007402     0.01953          2          320:
60%|######    | 24/40 [00:04<00:02,  5.58it/s]
      436/499       0.206G      0.02437    0.007527     0.02033          4          320:
60%|######    | 24/40 [00:04<00:02,  5.58it/s]
      436/499       0.206G      0.02437    0.007527     0.02033          4          320:
62%|######2   | 25/40 [00:04<00:02,  5.49it/s]
      436/499       0.206G      0.02372    0.007392     0.02012          1          320:
62%|######2   | 25/40 [00:04<00:02,  5.49it/s]
      436/499       0.206G      0.02372    0.007392     0.02012          1          320:
65%|######5   | 26/40 [00:04<00:02,  5.73it/s]
      436/499       0.206G      0.02447    0.007397     0.02003          2          320:
65%|######5   | 26/40 [00:04<00:02,  5.73it/s]
      436/499       0.206G      0.02447    0.007397     0.02003          2          320:
68%|######7   | 27/40 [00:04<00:02,  5.61it/s]
      436/499       0.206G      0.02395     0.00738      0.0198          2          320:
68%|######7   | 27/40 [00:04<00:02,  5.61it/s]
      436/499       0.206G      0.02395     0.00738      0.0198          2          320:
70%|#######   | 28/40 [00:04<00:02,  5.66it/s]
      436/499       0.206G      0.02353    0.007446     0.01965          2          320:
70%|#######   | 28/40 [00:05<00:02,  5.66it/s]
      436/499       0.206G      0.02353    0.007446     0.01965          2          320:
72%|#######2  | 29/40 [00:05<00:01,  5.87it/s]
```

```
     436/499      0.206G     0.02371    0.007428     0.01973          2        320:
72%|#######2  | 29/40 [00:05<00:01,  5.87it/s]
     436/499      0.206G     0.02371    0.007428     0.01973          2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.69it/s]
     436/499      0.206G      0.0245     0.00741     0.01976          2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.69it/s]
     436/499      0.206G      0.0245     0.00741     0.01976          2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.56it/s]
     436/499      0.206G     0.02494    0.007601      0.0199          4        320:
78%|#######7  | 31/40 [00:05<00:01,  5.56it/s]
     436/499      0.206G     0.02494    0.007601      0.0199          4        320:
80%|######## | 32/40 [00:05<00:01,  5.63it/s]
     436/499      0.206G      0.0246     0.00751     0.01975          1        320:
80%|######## | 32/40 [00:05<00:01,  5.63it/s]
     436/499      0.206G      0.0246     0.00751     0.01975          1        320:
82%|########2 | 33/40 [00:05<00:01,  5.69it/s]
     436/499      0.206G     0.02472     0.00775     0.01975          4        320:
82%|########2 | 33/40 [00:05<00:01,  5.69it/s]
     436/499      0.206G     0.02472     0.00775     0.01975          4        320:
85%|########5 | 34/40 [00:05<00:01,  5.56it/s]
     436/499      0.206G     0.02422    0.007652     0.01953          1        320:
85%|########5 | 34/40 [00:06<00:01,  5.56it/s]
     436/499      0.206G     0.02422    0.007652     0.01953          1        320:
88%|########7 | 35/40 [00:06<00:00,  5.63it/s]
     436/499      0.206G     0.02401    0.007768     0.01955          4        320:
88%|########7 | 35/40 [00:06<00:00,  5.63it/s]
     436/499      0.206G     0.02401    0.007768     0.01955          4        320:
90%|######### | 36/40 [00:06<00:00,  5.01it/s]
     436/499      0.206G     0.02393    0.007962     0.01959          4        320:
90%|######### | 36/40 [00:06<00:00,  5.01it/s]
     436/499      0.206G     0.02393    0.007962     0.01959          4        320:
92%|#########2| 37/40 [00:06<00:00,  5.34it/s]
     436/499      0.206G     0.02358    0.007862     0.01951          1        320:
92%|#########2| 37/40 [00:06<00:00,  5.34it/s]
     436/499      0.206G     0.02358    0.007862     0.01951          1        320:
95%|#########5| 38/40 [00:06<00:00,  5.47it/s]
     436/499      0.206G     0.02334    0.007742      0.0194          1        320:
95%|#########5| 38/40 [00:06<00:00,  5.47it/s]
     436/499      0.206G     0.02334    0.007742      0.0194          1        320:
98%|#########7| 39/40 [00:06<00:00,  5.47it/s]
     436/499      0.206G     0.02331    0.007952     0.01962          4        320:
98%|#########7| 39/40 [00:07<00:00,  5.47it/s]
     436/499      0.206G     0.02331    0.007952     0.01962          4        320:
100%|##########| 40/40 [00:07<00:00,  5.66it/s]
     436/499      0.206G     0.02331    0.007952     0.01962          4        320:
100%|##########| 40/40 [00:07<00:00,  5.67it/s]

                 Class      Images  Instances          P          R      mAP50
```

```
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:00, 18.29it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:01, 15.65it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 15.86it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 16.73it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 17.26it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 17.58it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 17.03it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:00<00:00, 17.31it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.60it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.81it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.27it/s]
                all         40         40      0.981      0.975      0.994
0.795

      Epoch    GPU_mem    box_loss    obj_loss    cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
    437/499     0.206G    0.03796    0.008222    0.01991          2        320:
0%|          | 0/40 [00:00<?, ?it/s]
    437/499     0.206G    0.03796    0.008222    0.01991          2        320:
2%|2         | 1/40 [00:00<00:06,  5.81it/s]
    437/499     0.206G    0.04421    0.006851    0.02136          2        320:
2%|2         | 1/40 [00:00<00:06,  5.81it/s]
    437/499     0.206G    0.04421    0.006851    0.02136          2        320:
5%|5         | 2/40 [00:00<00:06,  5.81it/s]
    437/499     0.206G    0.03609     0.00961    0.02043          4        320:
5%|5         | 2/40 [00:00<00:06,  5.81it/s]
    437/499     0.206G    0.03609     0.00961    0.02043          4        320:
8%|7         | 3/40 [00:00<00:06,  5.57it/s]
    437/499     0.206G    0.03407    0.008719    0.02079          1        320:
8%|7         | 3/40 [00:00<00:06,  5.57it/s]
    437/499     0.206G    0.03407    0.008719    0.02079          1        320:
10%|#         | 4/40 [00:00<00:06,  5.67it/s]
    437/499     0.206G    0.03194     0.0085     0.02156          2        320:
10%|#         | 4/40 [00:00<00:06,  5.67it/s]
    437/499     0.206G    0.03194     0.0085     0.02156          2        320:
```

```
12%|#2        | 5/40 [00:00<00:06,  5.22it/s]
    437/499    0.206G    0.02974    0.007694    0.02035        1        320:
12%|#2        | 5/40 [00:01<00:06,  5.22it/s]
    437/499    0.206G    0.02974    0.007694    0.02035        1        320:
15%|#5        | 6/40 [00:01<00:06,  5.39it/s]
    437/499    0.206G    0.02632    0.00696     0.0195         1        320:
15%|#5        | 6/40 [00:01<00:06,  5.39it/s]
    437/499    0.206G    0.02632    0.00696     0.0195         1        320:
18%|#7        | 7/40 [00:01<00:06,  5.09it/s]
    437/499    0.206G    0.02626    0.007251    0.01918        3        320:
18%|#7        | 7/40 [00:01<00:06,  5.09it/s]
    437/499    0.206G    0.02626    0.007251    0.01918        3        320:
20%|##        | 8/40 [00:01<00:06,  5.16it/s]
    437/499    0.206G    0.02492    0.007574    0.01899        2        320:
20%|##        | 8/40 [00:01<00:06,  5.16it/s]
    437/499    0.206G    0.02492    0.007574    0.01899        2        320:
22%|##2       | 9/40 [00:01<00:06,  5.08it/s]
    437/499    0.206G    0.02443    0.00747     0.0191         1        320:
22%|##2       | 9/40 [00:01<00:06,  5.08it/s]
    437/499    0.206G    0.02443    0.00747     0.0191         1        320:
25%|##5       | 10/40 [00:01<00:05,  5.03it/s]
    437/499    0.206G    0.02304    0.007061    0.01907        1        320:
25%|##5       | 10/40 [00:02<00:05,  5.03it/s]
    437/499    0.206G    0.02304    0.007061    0.01907        1        320:
28%|##7       | 11/40 [00:02<00:05,  4.98it/s]
    437/499    0.206G    0.02173    0.006779    0.01904        1        320:
28%|##7       | 11/40 [00:02<00:05,  4.98it/s]
    437/499    0.206G    0.02173    0.006779    0.01904        1        320:
30%|###       | 12/40 [00:02<00:05,  5.08it/s]
    437/499    0.206G    0.0236     0.007415    0.01953        4        320:
30%|###       | 12/40 [00:02<00:05,  5.08it/s]
    437/499    0.206G    0.0236     0.007415    0.01953        4        320:
32%|###2      | 13/40 [00:02<00:05,  5.03it/s]
    437/499    0.206G    0.02279    0.007379    0.01914        1        320:
32%|###2      | 13/40 [00:02<00:05,  5.03it/s]
    437/499    0.206G    0.02279    0.007379    0.01914        1        320:
35%|###5      | 14/40 [00:02<00:05,  4.99it/s]
    437/499    0.206G    0.02286    0.007109    0.01896        1        320:
35%|###5      | 14/40 [00:02<00:05,  4.99it/s]
    437/499    0.206G    0.02286    0.007109    0.01896        1        320:
38%|###7      | 15/40 [00:02<00:05,  4.85it/s]
    437/499    0.206G    0.02319    0.007655    0.0189         4        320:
38%|###7      | 15/40 [00:03<00:05,  4.85it/s]
    437/499    0.206G    0.02319    0.007655    0.0189         4        320:
40%|####      | 16/40 [00:03<00:04,  4.85it/s]
    437/499    0.206G    0.02392    0.00767     0.02029        2        320:
40%|####      | 16/40 [00:03<00:04,  4.85it/s]
    437/499    0.206G    0.02392    0.00767     0.02029        2        320:
```

```
42%|####2      | 17/40 [00:03<00:04,  4.87it/s]
     437/499     0.206G      0.023   0.007379      0.0207        1        320:
42%|####2      | 17/40 [00:03<00:04,  4.87it/s]
     437/499     0.206G      0.023   0.007379      0.0207        1        320:
45%|####5      | 18/40 [00:03<00:04,  5.00it/s]
     437/499     0.206G    0.02249   0.007163     0.02057        1        320:
45%|####5      | 18/40 [00:03<00:04,  5.00it/s]
     437/499     0.206G    0.02249   0.007163     0.02057        1        320:
48%|####7      | 19/40 [00:03<00:04,  4.97it/s]
     437/499     0.206G    0.02276    0.00748     0.02082        4        320:
48%|####7      | 19/40 [00:03<00:04,  4.97it/s]
     437/499     0.206G    0.02276    0.00748     0.02082        4        320:
50%|#####      | 20/40 [00:03<00:04,  4.84it/s]
     437/499     0.206G    0.02268   0.007894     0.02108        4        320:
50%|#####      | 20/40 [00:04<00:04,  4.84it/s]
     437/499     0.206G    0.02268   0.007894     0.02108        4        320:
52%|#####2     | 21/40 [00:04<00:03,  4.97it/s]
     437/499     0.206G    0.02235   0.007803     0.02078        1        320:
52%|#####2     | 21/40 [00:04<00:03,  4.97it/s]
     437/499     0.206G    0.02235   0.007803     0.02078        1        320:
55%|#####5     | 22/40 [00:04<00:03,  5.28it/s]
     437/499     0.206G    0.02193    0.00777     0.02071        2        320:
55%|#####5     | 22/40 [00:04<00:03,  5.28it/s]
     437/499     0.206G    0.02193    0.00777     0.02071        2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.47it/s]
     437/499     0.206G    0.02169   0.007735     0.02054        2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.47it/s]
     437/499     0.206G    0.02169   0.007735     0.02054        2        320:
60%|######     | 24/40 [00:04<00:02,  5.43it/s]
     437/499     0.206G    0.02161   0.007728      0.0205        2        320:
60%|######     | 24/40 [00:04<00:02,  5.43it/s]
     437/499     0.206G    0.02161   0.007728      0.0205        2        320:
62%|######2    | 25/40 [00:04<00:02,  5.53it/s]
     437/499     0.206G    0.02172   0.007658     0.02036        2        320:
62%|######2    | 25/40 [00:05<00:02,  5.53it/s]
     437/499     0.206G    0.02172   0.007658     0.02036        2        320:
65%|######5    | 26/40 [00:05<00:02,  5.47it/s]
     437/499     0.206G    0.02265   0.007727     0.02019        3        320:
65%|######5    | 26/40 [00:05<00:02,  5.47it/s]
     437/499     0.206G    0.02265   0.007727     0.02019        3        320:
68%|######7    | 27/40 [00:05<00:02,  5.42it/s]
     437/499     0.206G    0.02297   0.008069     0.02039        4        320:
68%|######7    | 27/40 [00:05<00:02,  5.42it/s]
     437/499     0.206G    0.02297   0.008069     0.02039        4        320:
70%|#######    | 28/40 [00:05<00:02,  5.53it/s]
     437/499     0.206G    0.02254   0.008061      0.0203        2        320:
70%|#######    | 28/40 [00:05<00:02,  5.53it/s]
     437/499     0.206G    0.02254   0.008061      0.0203        2        320:
```

```
72%|#######2  | 29/40 [00:05<00:02,  5.47it/s]
     437/499     0.206G     0.02224     0.007998     0.02026          2          320:
72%|#######2  | 29/40 [00:05<00:02,  5.47it/s]
     437/499     0.206G     0.02224     0.007998     0.02026          2          320:
75%|#######5  | 30/40 [00:05<00:01,  5.41it/s]
     437/499     0.206G     0.02188     0.007976     0.02021          2          320:
75%|#######5  | 30/40 [00:05<00:01,  5.41it/s]
     437/499     0.206G     0.02188     0.007976     0.02021          2          320:
78%|#######7  | 31/40 [00:05<00:01,  5.67it/s]
     437/499     0.206G     0.02155     0.007824     0.02043          1          320:
78%|#######7  | 31/40 [00:06<00:01,  5.67it/s]
     437/499     0.206G     0.02155     0.007824     0.02043          1          320:
80%|########  | 32/40 [00:06<00:01,  5.71it/s]
     437/499     0.206G     0.02233     0.007801     0.02029          2          320:
80%|########  | 32/40 [00:06<00:01,  5.71it/s]
     437/499     0.206G     0.02233     0.007801     0.02029          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.60it/s]
     437/499     0.206G     0.02244     0.007766     0.02046          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.60it/s]
     437/499     0.206G     0.02244     0.007766     0.02046          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.49it/s]
     437/499     0.206G     0.02241     0.007652     0.02044          1          320:
85%|########5 | 34/40 [00:06<00:01,  5.49it/s]
     437/499     0.206G     0.02241     0.007652     0.02044          1          320:
88%|########7 | 35/40 [00:06<00:00,  5.59it/s]
     437/499     0.206G     0.02211     0.007837     0.02034          4          320:
88%|########7 | 35/40 [00:06<00:00,  5.59it/s]
     437/499     0.206G     0.02211     0.007837     0.02034          4          320:
90%|######### | 36/40 [00:06<00:00,  5.65it/s]
     437/499     0.206G     0.02221     0.007955     0.0204          4          320:
90%|######### | 36/40 [00:06<00:00,  5.65it/s]
     437/499     0.206G     0.02221     0.007955     0.0204          4          320:
92%|#########2| 37/40 [00:06<00:00,  5.69it/s]
     437/499     0.206G     0.02188     0.007824     0.02021          1          320:
92%|#########2| 37/40 [00:07<00:00,  5.69it/s]
     437/499     0.206G     0.02188     0.007824     0.02021          1          320:
95%|#########5| 38/40 [00:07<00:00,  5.88it/s]
     437/499     0.206G     0.02163     0.007725     0.02007          1          320:
95%|#########5| 38/40 [00:07<00:00,  5.88it/s]
     437/499     0.206G     0.02163     0.007725     0.02007          1          320:
98%|#########7| 39/40 [00:07<00:00,  5.80it/s]
     437/499     0.206G     0.02187     0.007718     0.02059          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.80it/s]
     437/499     0.206G     0.02187     0.007718     0.02059          2          320:
100%|##########| 40/40 [00:07<00:00,  5.86it/s]
     437/499     0.206G     0.02187     0.007718     0.02059          2          320:
100%|##########| 40/40 [00:07<00:00,  5.35it/s]
```

```
        Class     Images  Instances        P          R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 15.98it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 17.26it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 16.70it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 17.09it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 16.66it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 16.43it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 16.99it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 15.93it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 17.75it/s]
        Class     Images  Instances        P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.98it/s]
          all         40         40      0.981      0.975      0.994
0.795


     Epoch   GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
   438/499    0.206G    0.02715    0.01051     0.0174          2        320:
0%|          | 0/40 [00:00<?, ?it/s]
   438/499    0.206G    0.02715    0.01051     0.0174          2        320:
2%|2         | 1/40 [00:00<00:06,  6.41it/s]
   438/499    0.206G    0.01848   0.008443    0.01763          2        320:
2%|2         | 1/40 [00:00<00:06,  6.41it/s]
   438/499    0.206G    0.01848   0.008443    0.01763          2        320:
5%|5         | 2/40 [00:00<00:06,  6.00it/s]
   438/499    0.206G    0.01742   0.006916    0.01686          1        320:
5%|5         | 2/40 [00:00<00:06,  6.00it/s]
   438/499    0.206G    0.01742   0.006916    0.01686          1        320:
8%|7         | 3/40 [00:00<00:05,  6.18it/s]
   438/499    0.206G    0.01505   0.007167    0.01713          2        320:
8%|7         | 3/40 [00:00<00:05,  6.18it/s]
   438/499    0.206G    0.01505   0.007167    0.01713          2        320:
10%|#         | 4/40 [00:00<00:05,  6.03it/s]
   438/499    0.206G    0.01592   0.007625    0.01693          2        320:
10%|#         | 4/40 [00:00<00:05,  6.03it/s]
   438/499    0.206G    0.01592   0.007625    0.01693          2        320:
12%|#2        | 5/40 [00:00<00:05,  5.94it/s]
```

```
     438/499      0.206G    0.01985    0.01003    0.01774         4         320:
12%|#2         | 5/40 [00:01<00:05,  5.94it/s]
     438/499      0.206G    0.01985    0.01003    0.01774         4         320:
15%|#5         | 6/40 [00:01<00:06,  5.55it/s]
     438/499      0.206G    0.01993   0.009253     0.0177         1         320:
15%|#5         | 6/40 [00:01<00:06,  5.55it/s]
     438/499      0.206G    0.01993   0.009253     0.0177         1         320:
18%|#7         | 7/40 [00:01<00:05,  5.63it/s]
     438/499      0.206G     0.0186   0.008504    0.01815         1         320:
18%|#7         | 7/40 [00:01<00:05,  5.63it/s]
     438/499      0.206G     0.0186   0.008504    0.01815         1         320:
20%|##         | 8/40 [00:01<00:05,  5.67it/s]
     438/499      0.206G    0.02081   0.008604    0.02119         2         320:
20%|##         | 8/40 [00:01<00:05,  5.67it/s]
     438/499      0.206G    0.02081   0.008604    0.02119         2         320:
22%|##2        | 9/40 [00:01<00:05,  5.72it/s]
     438/499      0.206G    0.02023   0.008797    0.02066         2         320:
22%|##2        | 9/40 [00:01<00:05,  5.72it/s]
     438/499      0.206G    0.02023   0.008797    0.02066         2         320:
25%|##5        | 10/40 [00:01<00:05,  5.75it/s]
     438/499      0.206G    0.01934   0.008307    0.02023         1         320:
25%|##5        | 10/40 [00:01<00:05,  5.75it/s]
     438/499      0.206G    0.01934   0.008307    0.02023         1         320:
28%|##7        | 11/40 [00:01<00:05,  5.75it/s]
     438/499      0.206G    0.01972   0.009104    0.02063         4         320:
28%|##7        | 11/40 [00:02<00:05,  5.75it/s]
     438/499      0.206G    0.01972   0.009104    0.02063         4         320:
30%|###        | 12/40 [00:02<00:05,  5.47it/s]
     438/499      0.206G    0.01954   0.009793     0.0205         4         320:
30%|###        | 12/40 [00:02<00:05,  5.47it/s]
     438/499      0.206G    0.01954   0.009793     0.0205         4         320:
32%|###2       | 13/40 [00:02<00:04,  5.57it/s]
     438/499      0.206G    0.01969    0.01052    0.02068         4         320:
32%|###2       | 13/40 [00:02<00:04,  5.57it/s]
     438/499      0.206G    0.01969    0.01052    0.02068         4         320:
35%|###5       | 14/40 [00:02<00:04,  5.48it/s]
     438/499      0.206G    0.02031    0.01062    0.02231         2         320:
35%|###5       | 14/40 [00:02<00:04,  5.48it/s]
     438/499      0.206G    0.02031    0.01062    0.02231         2         320:
38%|###7       | 15/40 [00:02<00:04,  5.30it/s]
     438/499      0.206G    0.02021     0.0107    0.02223         4         320:
38%|###7       | 15/40 [00:02<00:04,  5.30it/s]
     438/499      0.206G    0.02021     0.0107    0.02223         4         320:
40%|####       | 16/40 [00:02<00:04,  5.31it/s]
     438/499      0.206G    0.01973    0.01067    0.02184         2         320:
40%|####       | 16/40 [00:03<00:04,  5.31it/s]
     438/499      0.206G    0.01973    0.01067    0.02184         2         320:
42%|####2      | 17/40 [00:03<00:04,  5.43it/s]
```

91

```
     438/499      0.206G     0.01917      0.01043     0.02157            2          320:
42%|####2     | 17/40 [00:03<00:04,  5.43it/s]
     438/499      0.206G     0.01917      0.01043     0.02157            2          320:
45%|####5     | 18/40 [00:03<00:04,  5.40it/s]
     438/499      0.206G     0.01905      0.01037     0.02119            2          320:
45%|####5     | 18/40 [00:03<00:04,  5.40it/s]
     438/499      0.206G     0.01905      0.01037     0.02119            2          320:
48%|####7     | 19/40 [00:03<00:03,  5.52it/s]
     438/499      0.206G     0.01882      0.01007     0.02078            1          320:
48%|####7     | 19/40 [00:03<00:03,  5.52it/s]
     438/499      0.206G     0.01882      0.01007     0.02078            1          320:
50%|#####     | 20/40 [00:03<00:03,  5.18it/s]
     438/499      0.206G     0.01818     0.009712     0.02048            1          320:
50%|#####     | 20/40 [00:03<00:03,  5.18it/s]
     438/499      0.206G     0.01818     0.009712     0.02048            1          320:
52%|#####2    | 21/40 [00:03<00:03,  5.36it/s]
     438/499      0.206G     0.01779     0.009598     0.02043            2          320:
52%|#####2    | 21/40 [00:03<00:03,  5.36it/s]
     438/499      0.206G     0.01779     0.009598     0.02043            2          320:
55%|#####5    | 22/40 [00:03<00:03,  5.34it/s]
     438/499      0.206G     0.01745     0.009409     0.02017            1          320:
55%|#####5    | 22/40 [00:04<00:03,  5.34it/s]
     438/499      0.206G     0.01745     0.009409     0.02017            1          320:
57%|#####7    | 23/40 [00:04<00:03,  5.47it/s]
     438/499      0.206G      0.0175     0.009243     0.02002            2          320:
57%|#####7    | 23/40 [00:04<00:03,  5.47it/s]
     438/499      0.206G      0.0175     0.009243     0.02002            2          320:
60%|######    | 24/40 [00:04<00:02,  5.57it/s]
     438/499      0.206G       0.018     0.009223     0.01978            2          320:
60%|######    | 24/40 [00:04<00:02,  5.57it/s]
     438/499      0.206G       0.018     0.009223     0.01978            2          320:
62%|######2   | 25/40 [00:04<00:02,  5.64it/s]
     438/499      0.206G     0.01767     0.009079     0.01952            2          320:
62%|######2   | 25/40 [00:04<00:02,  5.64it/s]
     438/499      0.206G     0.01767     0.009079     0.01952            2          320:
65%|######5   | 26/40 [00:04<00:02,  5.68it/s]
     438/499      0.206G     0.01906     0.008913     0.01944            2          320:
65%|######5   | 26/40 [00:04<00:02,  5.68it/s]
     438/499      0.206G     0.01906     0.008913     0.01944            2          320:
68%|######7   | 27/40 [00:04<00:02,  5.72it/s]
     438/499      0.206G     0.01875     0.008767     0.01926            2          320:
68%|######7   | 27/40 [00:05<00:02,  5.72it/s]
     438/499      0.206G     0.01875     0.008767     0.01926            2          320:
70%|#######   | 28/40 [00:05<00:02,  5.74it/s]
     438/499      0.206G     0.01904     0.008936     0.01922            4          320:
70%|#######   | 28/40 [00:05<00:02,  5.74it/s]
     438/499      0.206G     0.01904     0.008936     0.01922            4          320:
72%|#######2  | 29/40 [00:05<00:01,  5.75it/s]
```

```
   438/499      0.206G     0.01885    0.008748       0.01908          1        320:
72%|#######2 | 29/40 [00:05<00:01,  5.75it/s]
   438/499      0.206G     0.01885    0.008748       0.01908          1        320:
75%|#######5 | 30/40 [00:05<00:01,  5.76it/s]
   438/499      0.206G     0.01949    0.008691       0.01961          2        320:
75%|#######5 | 30/40 [00:05<00:01,  5.76it/s]
   438/499      0.206G     0.01949    0.008691       0.01961          2        320:
78%|#######7 | 31/40 [00:05<00:01,  5.62it/s]
   438/499      0.206G      0.0192    0.008623       0.01945          2        320:
78%|#######7 | 31/40 [00:05<00:01,  5.62it/s]
   438/499      0.206G      0.0192    0.008623       0.01945          2        320:
80%|######## | 32/40 [00:05<00:01,  5.69it/s]
   438/499      0.206G     0.01941    0.008553       0.01932          2        320:
80%|######## | 32/40 [00:05<00:01,  5.69it/s]
   438/499      0.206G     0.01941    0.008553       0.01932          2        320:
82%|########2 | 33/40 [00:05<00:01,  5.58it/s]
   438/499      0.206G     0.01908    0.008416       0.01931          1        320:
82%|########2 | 33/40 [00:06<00:01,  5.58it/s]
   438/499      0.206G     0.01908    0.008416       0.01931          1        320:
85%|########5 | 34/40 [00:06<00:01,  5.65it/s]
   438/499      0.206G     0.01892    0.008286       0.01915          1        320:
85%|########5 | 34/40 [00:06<00:01,  5.65it/s]
   438/499      0.206G     0.01892    0.008286       0.01915          1        320:
88%|########7 | 35/40 [00:06<00:00,  5.67it/s]
   438/499      0.206G     0.01886    0.008225       0.01904          1        320:
88%|########7 | 35/40 [00:06<00:00,  5.67it/s]
   438/499      0.206G     0.01886    0.008225       0.01904          1        320:
90%|######### | 36/40 [00:06<00:00,  5.71it/s]
   438/499      0.206G     0.01963    0.008358        0.019          4        320:
90%|######### | 36/40 [00:06<00:00,  5.71it/s]
   438/499      0.206G     0.01963    0.008358        0.019          4        320:
92%|#########2| 37/40 [00:06<00:00,  5.75it/s]
   438/499      0.206G     0.01952    0.008332       0.01899          2        320:
92%|#########2| 37/40 [00:06<00:00,  5.75it/s]
   438/499      0.206G     0.01952    0.008332       0.01899          2        320:
95%|#########5| 38/40 [00:06<00:00,  5.75it/s]
   438/499      0.206G     0.01922    0.008221       0.01901          1        320:
95%|#########5| 38/40 [00:06<00:00,  5.75it/s]
   438/499      0.206G     0.01922    0.008221       0.01901          1        320:
98%|#########7| 39/40 [00:06<00:00,  5.77it/s]
   438/499      0.206G       0.019    0.008098        0.0189          1        320:
98%|#########7| 39/40 [00:07<00:00,  5.77it/s]
   438/499      0.206G       0.019    0.008098        0.0189          1        320:
100%|##########| 40/40 [00:07<00:00,  5.94it/s]
   438/499      0.206G       0.019    0.008098        0.0189          1        320:
100%|##########| 40/40 [00:07<00:00,  5.64it/s]

                 Class      Images   Instances           P           R       mAP50
```

```
mAP50-95:   0%|          | 0/20 [00:00<?, ?it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#         | 2/20 [00:00<00:01, 17.84it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##        | 4/20 [00:00<00:00, 16.71it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 14.66it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 15.16it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 14.77it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 14.58it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 15.00it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########  | 16/20 [00:01<00:00, 15.30it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.42it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.62it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.35it/s]
                 all         40         40      0.982      0.988      0.995
0.808

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
    439/499     0.206G    0.02264     0.0153    0.02439          4       320:
0%|          | 0/40 [00:00<?, ?it/s]
    439/499     0.206G    0.02264     0.0153    0.02439          4       320:
2%|2         | 1/40 [00:00<00:07,  5.32it/s]
    439/499     0.206G    0.01539   0.009607    0.02056          1       320:
2%|2         | 1/40 [00:00<00:07,  5.32it/s]
    439/499     0.206G    0.01539   0.009607    0.02056          1       320:
5%|5         | 2/40 [00:00<00:07,  5.33it/s]
    439/499     0.206G    0.02119   0.008396    0.02026          2       320:
5%|5         | 2/40 [00:00<00:07,  5.33it/s]
    439/499     0.206G    0.02119   0.008396    0.02026          2       320:
8%|7         | 3/40 [00:00<00:07,  4.93it/s]
    439/499     0.206G    0.02215    0.01116    0.02019          4       320:
8%|7         | 3/40 [00:00<00:07,  4.93it/s]
    439/499     0.206G    0.02215    0.01116    0.02019          4       320:
10%|#         | 4/40 [00:00<00:07,  4.93it/s]
    439/499     0.206G    0.01919   0.009489       0.02          1       320:
10%|#         | 4/40 [00:00<00:07,  4.93it/s]
    439/499     0.206G    0.01919   0.009489       0.02          1       320:
```

```
12%|#2          | 5/40 [00:00<00:06,  5.05it/s]
    439/499      0.206G     0.02074     0.01091      0.0207         4          320:
12%|#2          | 5/40 [00:01<00:06,  5.05it/s]
    439/499      0.206G     0.02074     0.01091      0.0207         4          320:
15%|#5          | 6/40 [00:01<00:06,  5.00it/s]
    439/499      0.206G     0.02547     0.01055     0.02053         3          320:
15%|#5          | 6/40 [00:01<00:06,  5.00it/s]
    439/499      0.206G     0.02547     0.01055     0.02053         3          320:
18%|#7          | 7/40 [00:01<00:06,  4.98it/s]
    439/499      0.206G     0.02482     0.01077     0.02038         4          320:
18%|#7          | 7/40 [00:01<00:06,  4.98it/s]
    439/499      0.206G     0.02482     0.01077     0.02038         4          320:
20%|##          | 8/40 [00:01<00:06,  4.83it/s]
    439/499      0.206G     0.02521     0.01054     0.02088         2          320:
20%|##          | 8/40 [00:01<00:06,  4.83it/s]
    439/499      0.206G     0.02521     0.01054     0.02088         2          320:
22%|##2         | 9/40 [00:01<00:06,  4.97it/s]
    439/499      0.206G     0.02752      0.0106     0.02037         3          320:
22%|##2         | 9/40 [00:02<00:06,  4.97it/s]
    439/499      0.206G     0.02752      0.0106     0.02037         3          320:
25%|##5         | 10/40 [00:02<00:06,  4.96it/s]
    439/499      0.206G     0.02566    0.009865     0.02051         1          320:
25%|##5         | 10/40 [00:02<00:06,  4.96it/s]
    439/499      0.206G     0.02566    0.009865     0.02051         1          320:
28%|##7         | 11/40 [00:02<00:05,  5.05it/s]
    439/499      0.206G     0.02689    0.009639       0.021         2          320:
28%|##7         | 11/40 [00:02<00:05,  5.05it/s]
    439/499      0.206G     0.02689    0.009639       0.021         2          320:
30%|###         | 12/40 [00:02<00:05,  5.14it/s]
    439/499      0.206G     0.02554     0.00916     0.02029         1          320:
30%|###         | 12/40 [00:02<00:05,  5.14it/s]
    439/499      0.206G     0.02554     0.00916     0.02029         1          320:
32%|###2        | 13/40 [00:02<00:05,  5.25it/s]
    439/499      0.206G       0.027    0.009016     0.02021         2          320:
32%|###2        | 13/40 [00:02<00:05,  5.25it/s]
    439/499      0.206G       0.027    0.009016     0.02021         2          320:
35%|###5        | 14/40 [00:02<00:04,  5.20it/s]
    439/499      0.206G     0.02726    0.009476       0.021         3          320:
35%|###5        | 14/40 [00:02<00:04,  5.20it/s]
    439/499      0.206G     0.02726    0.009476       0.021         3          320:
38%|###7        | 15/40 [00:02<00:04,  5.24it/s]
    439/499      0.206G     0.02644    0.009135     0.02058         1          320:
38%|###7        | 15/40 [00:03<00:04,  5.24it/s]
    439/499      0.206G     0.02644    0.009135     0.02058         1          320:
40%|####        | 16/40 [00:03<00:04,  5.25it/s]
    439/499      0.206G      0.0254    0.008906     0.02025         2          320:
40%|####        | 16/40 [00:03<00:04,  5.25it/s]
    439/499      0.206G      0.0254    0.008906     0.02025         2          320:
```

```
42%|####2      | 17/40 [00:03<00:04,  5.27it/s]
    439/499      0.206G      0.0251   0.008995    0.02014        4        320:
42%|####2      | 17/40 [00:03<00:04,  5.27it/s]
    439/499      0.206G      0.0251   0.008995    0.02014        4        320:
45%|####5      | 18/40 [00:03<00:04,  5.43it/s]
    439/499      0.206G     0.02611   0.009128    0.02001        2        320:
45%|####5      | 18/40 [00:03<00:04,  5.43it/s]
    439/499      0.206G     0.02611   0.009128    0.02001        2        320:
48%|####7      | 19/40 [00:03<00:03,  5.39it/s]
    439/499      0.206G     0.02548   0.008898    0.01988        1        320:
48%|####7      | 19/40 [00:03<00:03,  5.39it/s]
    439/499      0.206G     0.02548   0.008898    0.01988        1        320:
50%|#####      | 20/40 [00:03<00:03,  5.24it/s]
    439/499      0.206G     0.02489   0.008645    0.01967        1        320:
50%|#####      | 20/40 [00:04<00:03,  5.24it/s]
    439/499      0.206G     0.02489   0.008645    0.01967        1        320:
52%|#####2     | 21/40 [00:04<00:03,  5.54it/s]
    439/499      0.206G     0.02517   0.008552    0.01989        2        320:
52%|#####2     | 21/40 [00:04<00:03,  5.54it/s]
    439/499      0.206G     0.02517   0.008552    0.01989        2        320:
55%|#####5     | 22/40 [00:04<00:03,  5.45it/s]
    439/499      0.206G     0.02511   0.008971    0.01988        4        320:
55%|#####5     | 22/40 [00:04<00:03,  5.45it/s]
    439/499      0.206G     0.02511   0.008971    0.01988        4        320:
57%|#####7     | 23/40 [00:04<00:03,  5.41it/s]
    439/499      0.206G     0.02447    0.00878    0.01961        1        320:
57%|#####7     | 23/40 [00:04<00:03,  5.41it/s]
    439/499      0.206G     0.02447    0.00878    0.01961        1        320:
60%|######     | 24/40 [00:04<00:02,  5.53it/s]
    439/499      0.206G     0.02421   0.008918    0.01963        4        320:
60%|######     | 24/40 [00:04<00:02,  5.53it/s]
    439/499      0.206G     0.02421   0.008918    0.01963        4        320:
62%|######2    | 25/40 [00:04<00:02,  5.48it/s]
    439/499      0.206G     0.02392   0.009039    0.02009        4        320:
62%|######2    | 25/40 [00:04<00:02,  5.48it/s]
    439/499      0.206G     0.02392   0.009039    0.02009        4        320:
65%|######5    | 26/40 [00:04<00:02,  5.43it/s]
    439/499      0.206G     0.02376    0.00923    0.02021        4        320:
65%|######5    | 26/40 [00:05<00:02,  5.43it/s]
    439/499      0.206G     0.02376    0.00923    0.02021        4        320:
68%|######7    | 27/40 [00:05<00:02,  5.55it/s]
    439/499      0.206G     0.02365    0.00916    0.02034        2        320:
68%|######7    | 27/40 [00:05<00:02,  5.55it/s]
    439/499      0.206G     0.02365    0.00916    0.02034        2        320:
70%|#######    | 28/40 [00:05<00:02,  5.45it/s]
    439/499      0.206G     0.02327    0.00896    0.02025        1        320:
70%|#######    | 28/40 [00:05<00:02,  5.45it/s]
    439/499      0.206G     0.02327    0.00896    0.02025        1        320:
```

```
72%|#######2  | 29/40 [00:05<00:02,  5.42it/s]
    439/499      0.206G      0.0233   0.008887   0.02128        2        320:
72%|#######2  | 29/40 [00:05<00:02,  5.42it/s]
    439/499      0.206G      0.0233   0.008887   0.02128        2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.53it/s]
    439/499      0.206G     0.02279    0.00872   0.02102        1        320:
75%|#######5  | 30/40 [00:05<00:01,  5.53it/s]
    439/499      0.206G     0.02279    0.00872   0.02102        1        320:
78%|#######7  | 31/40 [00:05<00:01,  5.45it/s]
    439/499      0.206G     0.02228   0.008544   0.02094        1        320:
78%|#######7  | 31/40 [00:06<00:01,  5.45it/s]
    439/499      0.206G     0.02228   0.008544   0.02094        1        320:
80%|######## | 32/40 [00:06<00:01,  5.41it/s]
    439/499      0.206G     0.02238   0.008529   0.02116        2        320:
80%|######## | 32/40 [00:06<00:01,  5.41it/s]
    439/499      0.206G     0.02238   0.008529   0.02116        2        320:
82%|########2 | 33/40 [00:06<00:01,  5.17it/s]
    439/499      0.206G     0.02216   0.008385   0.02097        1        320:
82%|########2 | 33/40 [00:06<00:01,  5.17it/s]
    439/499      0.206G     0.02216   0.008385   0.02097        1        320:
85%|########5 | 34/40 [00:06<00:01,  5.43it/s]
    439/499      0.206G      0.0219   0.008278   0.02085        2        320:
85%|########5 | 34/40 [00:06<00:01,  5.43it/s]
    439/499      0.206G      0.0219   0.008278   0.02085        2        320:
88%|########7 | 35/40 [00:06<00:00,  5.54it/s]
    439/499      0.206G     0.02177   0.008178   0.02066        1        320:
88%|########7 | 35/40 [00:06<00:00,  5.54it/s]
    439/499      0.206G     0.02177   0.008178   0.02066        1        320:
90%|######### | 36/40 [00:06<00:00,  5.60it/s]
    439/499      0.206G      0.0213   0.008047   0.02059        1        320:
90%|######### | 36/40 [00:06<00:00,  5.60it/s]
    439/499      0.206G      0.0213   0.008047   0.02059        1        320:
92%|#########2| 37/40 [00:06<00:00,  5.65it/s]
    439/499      0.206G     0.02214   0.007959   0.02123        2        320:
92%|#########2| 37/40 [00:07<00:00,  5.65it/s]
    439/499      0.206G     0.02214   0.007959   0.02123        2        320:
95%|#########5| 38/40 [00:07<00:00,  5.41it/s]
    439/499      0.206G     0.02271   0.007929   0.02107        2        320:
95%|#########5| 38/40 [00:07<00:00,  5.41it/s]
    439/499      0.206G     0.02271   0.007929   0.02107        2        320:
98%|#########7| 39/40 [00:07<00:00,  5.41it/s]
    439/499      0.206G     0.02265   0.007818   0.02095        1        320:
98%|#########7| 39/40 [00:07<00:00,  5.41it/s]
    439/499      0.206G     0.02265   0.007818   0.02095        1        320:
100%|##########| 40/40 [00:07<00:00,  5.51it/s]
    439/499      0.206G     0.02265   0.007818   0.02095        1        320:
100%|##########| 40/40 [00:07<00:00,  5.32it/s]
```

```
              Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:01, 16.08it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:00, 16.03it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 16.81it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 16.51it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####        | 10/20 [00:00<00:00, 15.61it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######       | 12/20 [00:00<00:00, 16.42it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5     | 15/20 [00:00<00:00, 17.35it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  85%|########5    | 17/20 [00:01<00:00, 16.94it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5   | 19/20 [00:01<00:00, 17.31it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########   | 20/20 [00:01<00:00, 16.99it/s]
                all         40         40      0.982      0.988      0.995
0.808


      Epoch    GPU_mem    box_loss    obj_loss    cls_loss   Instances       Size

  0%|              | 0/40 [00:00<?, ?it/s]
    440/499     0.206G     0.03264    0.009068     0.02244          3        320:
0%|          | 0/40 [00:00<?, ?it/s]
    440/499     0.206G     0.03264    0.009068     0.02244          3        320:
2%|2          | 1/40 [00:00<00:07,  4.91it/s]
    440/499     0.206G     0.02132      0.0059     0.02009          1        320:
2%|2          | 1/40 [00:00<00:07,  4.91it/s]
    440/499     0.206G     0.02132      0.0059     0.02009          1        320:
5%|5          | 2/40 [00:00<00:06,  5.69it/s]
    440/499     0.206G     0.03177    0.005542     0.01988          2        320:
5%|5          | 2/40 [00:00<00:06,  5.69it/s]
    440/499     0.206G     0.03177    0.005542     0.01988          2        320:
8%|7          | 3/40 [00:00<00:06,  5.74it/s]
    440/499     0.206G     0.02757     0.00538        0.02          2        320:
8%|7          | 3/40 [00:00<00:06,  5.74it/s]
    440/499     0.206G     0.02757     0.00538        0.02          2        320:
10%|#          | 4/40 [00:00<00:06,  5.39it/s]
    440/499     0.206G     0.02426    0.004813     0.01991          1        320:
10%|#          | 4/40 [00:00<00:06,  5.39it/s]
    440/499     0.206G     0.02426    0.004813     0.01991          1        320:
12%|#2         | 5/40 [00:00<00:06,  5.53it/s]
```

```
    440/499      0.206G      0.02327    0.004652      0.01881              1          320:
12%|#2         | 5/40 [00:01<00:06,  5.53it/s]
    440/499      0.206G      0.02327    0.004652      0.01881              1          320:
15%|#5         | 6/40 [00:01<00:06,  5.60it/s]
    440/499      0.206G      0.02692    0.005082      0.01936              3          320:
15%|#5         | 6/40 [00:01<00:06,  5.60it/s]
    440/499      0.206G      0.02692    0.005082      0.01936              3          320:
18%|#7         | 7/40 [00:01<00:05,  5.67it/s]
    440/499      0.206G      0.02887    0.005198      0.01912              2          320:
18%|#7         | 7/40 [00:01<00:05,  5.67it/s]
    440/499      0.206G      0.02887    0.005198      0.01912              2          320:
20%|##         | 8/40 [00:01<00:05,  5.72it/s]
    440/499      0.206G      0.02674    0.00503       0.01893              1          320:
20%|##         | 8/40 [00:01<00:05,  5.72it/s]
    440/499      0.206G      0.02674    0.00503       0.01893              1          320:
22%|##2        | 9/40 [00:01<00:05,  5.74it/s]
    440/499      0.206G      0.02652    0.005493      0.0185               2          320:
22%|##2        | 9/40 [00:01<00:05,  5.74it/s]
    440/499      0.206G      0.02652    0.005493      0.0185               2          320:
25%|##5        | 10/40 [00:01<00:05,  5.61it/s]
    440/499      0.206G      0.0257     0.006136      0.0191               4          320:
25%|##5        | 10/40 [00:01<00:05,  5.61it/s]
    440/499      0.206G      0.0257     0.006136      0.0191               4          320:
28%|##7        | 11/40 [00:01<00:05,  5.36it/s]
    440/499      0.206G      0.02443    0.006058      0.01851              1          320:
28%|##7        | 11/40 [00:02<00:05,  5.36it/s]
    440/499      0.206G      0.02443    0.006058      0.01851              1          320:
30%|###        | 12/40 [00:02<00:05,  5.48it/s]
    440/499      0.206G      0.02459    0.007068      0.01872              4          320:
30%|###        | 12/40 [00:02<00:05,  5.48it/s]
    440/499      0.206G      0.02459    0.007068      0.01872              4          320:
32%|###2       | 13/40 [00:02<00:04,  5.44it/s]
    440/499      0.206G      0.02503    0.007496      0.01859              2          320:
32%|###2       | 13/40 [00:02<00:04,  5.44it/s]
    440/499      0.206G      0.02503    0.007496      0.01859              2          320:
35%|###5       | 14/40 [00:02<00:04,  5.53it/s]
    440/499      0.206G      0.02434    0.007154      0.01802              1          320:
35%|###5       | 14/40 [00:02<00:04,  5.53it/s]
    440/499      0.206G      0.02434    0.007154      0.01802              1          320:
38%|###7       | 15/40 [00:02<00:04,  5.62it/s]
    440/499      0.206G      0.02583    0.007167      0.01827              2          320:
38%|###7       | 15/40 [00:02<00:04,  5.62it/s]
    440/499      0.206G      0.02583    0.007167      0.01827              2          320:
40%|####       | 16/40 [00:02<00:04,  5.53it/s]
    440/499      0.206G      0.02514    0.006973      0.01807              1          320:
40%|####       | 16/40 [00:03<00:04,  5.53it/s]
    440/499      0.206G      0.02514    0.006973      0.01807              1          320:
42%|####2      | 17/40 [00:03<00:04,  5.48it/s]
```

```
     440/499      0.206G       0.0247    0.007221      0.01837           4            320:
42%|####2      | 17/40 [00:03<00:04,  5.48it/s]
     440/499      0.206G       0.0247    0.007221      0.01837           4            320:
45%|####5      | 18/40 [00:03<00:04,  5.41it/s]
     440/499      0.206G       0.0258    0.007212      0.01811           2            320:
45%|####5      | 18/40 [00:03<00:04,  5.41it/s]
     440/499      0.206G       0.0258    0.007212      0.01811           2            320:
48%|####7      | 19/40 [00:03<00:03,  5.38it/s]
     440/499      0.206G       0.0255    0.007575      0.01845           4            320:
48%|####7      | 19/40 [00:03<00:03,  5.38it/s]
     440/499      0.206G       0.0255    0.007575      0.01845           4            320:
50%|#####      | 20/40 [00:03<00:03,  5.35it/s]
     440/499      0.206G      0.02562    0.008062      0.01842           4            320:
50%|#####      | 20/40 [00:03<00:03,  5.35it/s]
     440/499      0.206G      0.02562    0.008062      0.01842           4            320:
52%|#####2     | 21/40 [00:03<00:03,  5.34it/s]
     440/499      0.206G       0.0248    0.007904      0.01833           1            320:
52%|#####2     | 21/40 [00:04<00:03,  5.34it/s]
     440/499      0.206G       0.0248    0.007904      0.01833           1            320:
55%|#####5     | 22/40 [00:04<00:03,  5.34it/s]
     440/499      0.206G      0.02459    0.007856      0.01818           2            320:
55%|#####5     | 22/40 [00:04<00:03,  5.34it/s]
     440/499      0.206G      0.02459    0.007856      0.01818           2            320:
57%|#####7     | 23/40 [00:04<00:03,  5.47it/s]
     440/499      0.206G      0.02411    0.007838      0.01801           1            320:
57%|#####7     | 23/40 [00:04<00:03,  5.47it/s]
     440/499      0.206G      0.02411    0.007838      0.01801           1            320:
60%|######     | 24/40 [00:04<00:02,  5.57it/s]
     440/499      0.206G      0.02356    0.008105      0.01766           1            320:
60%|######     | 24/40 [00:04<00:02,  5.57it/s]
     440/499      0.206G      0.02356    0.008105      0.01766           1            320:
62%|######2    | 25/40 [00:04<00:02,  5.64it/s]
     440/499      0.206G      0.02303    0.007955      0.01749           1            320:
62%|######2    | 25/40 [00:04<00:02,  5.64it/s]
     440/499      0.206G      0.02303    0.007955      0.01749           1            320:
65%|######5    | 26/40 [00:04<00:02,  5.67it/s]
     440/499      0.206G      0.02259    0.007816      0.01736           1            320:
65%|######5    | 26/40 [00:04<00:02,  5.67it/s]
     440/499      0.206G      0.02259    0.007816      0.01736           1            320:
68%|######7    | 27/40 [00:04<00:02,  5.72it/s]
     440/499      0.206G      0.02214    0.007776      0.01722           2            320:
68%|######7    | 27/40 [00:05<00:02,  5.72it/s]
     440/499      0.206G      0.02214    0.007776      0.01722           2            320:
70%|#######    | 28/40 [00:05<00:02,  5.75it/s]
     440/499      0.206G      0.02218    0.008008       0.0172           4            320:
70%|#######    | 28/40 [00:05<00:02,  5.75it/s]
     440/499      0.206G      0.02218    0.008008       0.0172           4            320:
72%|#######2   | 29/40 [00:05<00:02,  5.45it/s]
```

```
   440/499      0.206G     0.02177    0.007879     0.01716          1          320:
72%|#######2  | 29/40 [00:05<00:02,  5.45it/s]
   440/499      0.206G     0.02177    0.007879     0.01716          1          320:
75%|#######5  | 30/40 [00:05<00:01,  5.55it/s]
   440/499      0.206G     0.02217    0.008308      0.0173          4          320:
75%|#######5  | 30/40 [00:05<00:01,  5.55it/s]
   440/499      0.206G     0.02217    0.008308      0.0173          4          320:
78%|#######7  | 31/40 [00:05<00:01,  5.63it/s]
   440/499      0.206G     0.02185    0.008253     0.01719          2          320:
78%|#######7  | 31/40 [00:05<00:01,  5.63it/s]
   440/499      0.206G     0.02185    0.008253     0.01719          2          320:
80%|########  | 32/40 [00:05<00:01,  5.39it/s]
   440/499      0.206G     0.02185    0.008404     0.01734          3          320:
80%|########  | 32/40 [00:06<00:01,  5.39it/s]
   440/499      0.206G     0.02185    0.008404     0.01734          3          320:
82%|########2 | 33/40 [00:06<00:01,  5.24it/s]
   440/499      0.206G     0.02221    0.008737     0.01752          4          320:
82%|########2 | 33/40 [00:06<00:01,  5.24it/s]
   440/499      0.206G     0.02221    0.008737     0.01752          4          320:
85%|########5 | 34/40 [00:06<00:01,  5.13it/s]
   440/499      0.206G     0.02194    0.008675     0.01745          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.13it/s]
   440/499      0.206G     0.02194    0.008675     0.01745          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.07it/s]
   440/499      0.206G     0.02167    0.008598     0.01734          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.07it/s]
   440/499      0.206G     0.02167    0.008598     0.01734          2          320:
90%|######### | 36/40 [00:06<00:00,  5.02it/s]
   440/499      0.206G      0.0217    0.008641     0.01756          2          320:
90%|######### | 36/40 [00:06<00:00,  5.02it/s]
   440/499      0.206G      0.0217    0.008641     0.01756          2          320:
92%|#########2| 37/40 [00:06<00:00,  4.98it/s]
   440/499      0.206G     0.02155    0.008614     0.01758          2          320:
92%|#########2| 37/40 [00:07<00:00,  4.98it/s]
   440/499      0.206G     0.02155    0.008614     0.01758          2          320:
95%|#########5| 38/40 [00:07<00:00,  4.96it/s]
   440/499      0.206G     0.02148    0.008717     0.01782          4          320:
95%|#########5| 38/40 [00:07<00:00,  4.96it/s]
   440/499      0.206G     0.02148    0.008717     0.01782          4          320:
98%|#########7| 39/40 [00:07<00:00,  4.95it/s]
   440/499      0.206G     0.02134    0.008694     0.01777          1          320:
98%|#########7| 39/40 [00:07<00:00,  4.95it/s]
   440/499      0.206G     0.02134    0.008694     0.01777          1          320:
100%|##########| 40/40 [00:07<00:00,  4.91it/s]
   440/499      0.206G     0.02134    0.008694     0.01777          1          320:
100%|##########| 40/40 [00:07<00:00,  5.38it/s]

              Class      Images   Instances           P          R       mAP50
```

```
mAP50-95:    0%|              | 0/20 [00:00<?, ?it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   10%|#            | 2/20 [00:00<00:01, 16.00it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   20%|##           | 4/20 [00:00<00:00, 16.00it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   30%|###          | 6/20 [00:00<00:00, 14.62it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   40%|####         | 8/20 [00:00<00:00, 13.60it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   50%|#####        | 10/20 [00:00<00:00, 14.98it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   60%|######       | 12/20 [00:00<00:00, 15.31it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   70%|#######      | 14/20 [00:00<00:00, 14.57it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   80%|########     | 16/20 [00:01<00:00, 15.31it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   90%|######### | 18/20 [00:01<00:00, 16.13it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  100%|##########| 20/20 [00:01<00:00, 16.07it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  100%|##########| 20/20 [00:01<00:00, 15.38it/s]
                 all         40         40      0.975      0.975      0.989
0.807

       Epoch    GPU_mem    box_loss    obj_loss    cls_loss  Instances       Size

   0%|          | 0/40 [00:00<?, ?it/s]
     441/499     0.206G     0.03141    0.005773     0.03418          2        320:
0%|          | 0/40 [00:00<?, ?it/s]
     441/499     0.206G     0.03141    0.005773     0.03418          2        320:
2%|2         | 1/40 [00:00<00:06,  5.83it/s]
     441/499     0.206G     0.02604      0.0121     0.02954          4        320:
2%|2         | 1/40 [00:00<00:06,  5.83it/s]
     441/499     0.206G     0.02604      0.0121     0.02954          4        320:
5%|5         | 2/40 [00:00<00:06,  5.65it/s]
     441/499     0.206G     0.02159    0.009749     0.02583          1        320:
5%|5         | 2/40 [00:00<00:06,  5.65it/s]
     441/499     0.206G     0.02159    0.009749     0.02583          1        320:
8%|7         | 3/40 [00:00<00:06,  5.62it/s]
     441/499     0.206G     0.02617     0.01006     0.02501          4        320:
8%|7         | 3/40 [00:00<00:06,  5.62it/s]
     441/499     0.206G     0.02617     0.01006     0.02501          4        320:
10%|#         | 4/40 [00:00<00:06,  5.69it/s]
     441/499     0.206G     0.02965    0.009727     0.02594          2        320:
10%|#         | 4/40 [00:00<00:06,  5.69it/s]
     441/499     0.206G     0.02965    0.009727     0.02594          2        320:
```

```
12%|#2        | 5/40 [00:00<00:06,  5.58it/s]
    441/499    0.206G    0.02669    0.008666    0.02348        1        320:
12%|#2        | 5/40 [00:01<00:06,  5.58it/s]
    441/499    0.206G    0.02669    0.008666    0.02348        1        320:
15%|#5        | 6/40 [00:01<00:05,  5.80it/s]
    441/499    0.206G    0.02483    0.008197    0.02264        2        320:
15%|#5        | 6/40 [00:01<00:05,  5.80it/s]
    441/499    0.206G    0.02483    0.008197    0.02264        2        320:
18%|#7        | 7/40 [00:01<00:05,  5.81it/s]
    441/499    0.206G    0.02576    0.00791     0.02405        2        320:
18%|#7        | 7/40 [00:01<00:05,  5.81it/s]
    441/499    0.206G    0.02576    0.00791     0.02405        2        320:
20%|##        | 8/40 [00:01<00:05,  5.47it/s]
    441/499    0.206G    0.02763    0.008873    0.02361        4        320:
20%|##        | 8/40 [00:01<00:05,  5.47it/s]
    441/499    0.206G    0.02763    0.008873    0.02361        4        320:
22%|##2       | 9/40 [00:01<00:05,  5.43it/s]
    441/499    0.206G    0.02597    0.008632    0.02292        2        320:
22%|##2       | 9/40 [00:01<00:05,  5.43it/s]
    441/499    0.206G    0.02597    0.008632    0.02292        2        320:
25%|##5       | 10/40 [00:01<00:05,  5.40it/s]
    441/499    0.206G    0.02457    0.00825     0.02203        1        320:
25%|##5       | 10/40 [00:01<00:05,  5.40it/s]
    441/499    0.206G    0.02457    0.00825     0.02203        1        320:
28%|##7       | 11/40 [00:01<00:05,  5.50it/s]
    441/499    0.206G    0.02313    0.007758    0.02158        1        320:
28%|##7       | 11/40 [00:02<00:05,  5.50it/s]
    441/499    0.206G    0.02313    0.007758    0.02158        1        320:
30%|###       | 12/40 [00:02<00:04,  5.75it/s]
    441/499    0.206G    0.02251    0.007809    0.02154        2        320:
30%|###       | 12/40 [00:02<00:04,  5.75it/s]
    441/499    0.206G    0.02251    0.007809    0.02154        2        320:
32%|###2      | 13/40 [00:02<00:04,  5.62it/s]
    441/499    0.206G    0.02478    0.008076    0.02161        4        320:
32%|###2      | 13/40 [00:02<00:04,  5.62it/s]
    441/499    0.206G    0.02478    0.008076    0.02161        4        320:
35%|###5      | 14/40 [00:02<00:04,  5.50it/s]
    441/499    0.206G    0.0239     0.00798     0.02152        2        320:
35%|###5      | 14/40 [00:02<00:04,  5.50it/s]
    441/499    0.206G    0.0239     0.00798     0.02152        2        320:
38%|###7      | 15/40 [00:02<00:04,  5.74it/s]
    441/499    0.206G    0.02298    0.007718    0.02136        1        320:
38%|###7      | 15/40 [00:02<00:04,  5.74it/s]
    441/499    0.206G    0.02298    0.007718    0.02136        1        320:
40%|####      | 16/40 [00:02<00:04,  5.77it/s]
    441/499    0.206G    0.02238    0.007414    0.02101        1        320:
40%|####      | 16/40 [00:03<00:04,  5.77it/s]
    441/499    0.206G    0.02238    0.007414    0.02101        1        320:
```

```
42%|####2      | 17/40 [00:03<00:03,  5.78it/s]
    441/499      0.206G      0.02274    0.007418     0.02111           2         320:
42%|####2      | 17/40 [00:03<00:03,  5.78it/s]
    441/499      0.206G      0.02274    0.007418     0.02111           2         320:
45%|####5      | 18/40 [00:03<00:03,  5.79it/s]
    441/499      0.206G      0.02227    0.007309     0.02087           1         320:
45%|####5      | 18/40 [00:03<00:03,  5.79it/s]
    441/499      0.206G      0.02227    0.007309     0.02087           1         320:
48%|####7      | 19/40 [00:03<00:03,  5.80it/s]
    441/499      0.206G      0.02331    0.007894     0.02088           3         320:
48%|####7      | 19/40 [00:03<00:03,  5.80it/s]
    441/499      0.206G      0.02331    0.007894     0.02088           3         320:
50%|#####      | 20/40 [00:03<00:03,  5.69it/s]
    441/499      0.206G      0.02318    0.00799      0.02056           2         320:
50%|#####      | 20/40 [00:03<00:03,  5.69it/s]
    441/499      0.206G      0.02318    0.00799      0.02056           2         320:
52%|#####2     | 21/40 [00:03<00:03,  5.81it/s]
    441/499      0.206G      0.02368    0.008291     0.02069           3         320:
52%|#####2     | 21/40 [00:03<00:03,  5.81it/s]
    441/499      0.206G      0.02368    0.008291     0.02069           3         320:
55%|#####5     | 22/40 [00:03<00:03,  5.66it/s]
    441/499      0.206G      0.02314    0.008105     0.02007           1         320:
55%|#####5     | 22/40 [00:04<00:03,  5.66it/s]
    441/499      0.206G      0.02314    0.008105     0.02007           1         320:
57%|#####7     | 23/40 [00:04<00:02,  5.79it/s]
    441/499      0.206G      0.02283    0.007971      0.0198           1         320:
57%|#####7     | 23/40 [00:04<00:02,  5.79it/s]
    441/499      0.206G      0.02283    0.007971      0.0198           1         320:
60%|######     | 24/40 [00:04<00:02,  6.01it/s]
    441/499      0.206G      0.02309    0.008253     0.01993           4         320:
60%|######     | 24/40 [00:04<00:02,  6.01it/s]
    441/499      0.206G      0.02309    0.008253     0.01993           4         320:
62%|######2    | 25/40 [00:04<00:02,  5.95it/s]
    441/499      0.206G      0.02257    0.008246     0.01969           4         320:
62%|######2    | 25/40 [00:04<00:02,  5.95it/s]
    441/499      0.206G      0.02257    0.008246     0.01969           4         320:
65%|######5    | 26/40 [00:04<00:02,  5.73it/s]
    441/499      0.206G      0.02233    0.008464     0.01971           4         320:
65%|######5    | 26/40 [00:04<00:02,  5.73it/s]
    441/499      0.206G      0.02233    0.008464     0.01971           4         320:
68%|######7    | 27/40 [00:04<00:02,  5.62it/s]
    441/499      0.206G      0.02193    0.008539     0.01965           3         320:
68%|######7    | 27/40 [00:04<00:02,  5.62it/s]
    441/499      0.206G      0.02193    0.008539     0.01965           3         320:
70%|#######    | 28/40 [00:04<00:02,  5.26it/s]
    441/499      0.206G      0.02166    0.008424      0.0195           1         320:
70%|#######    | 28/40 [00:05<00:02,  5.26it/s]
    441/499      0.206G      0.02166    0.008424      0.0195           1         320:
```

```
72%|#######2   | 29/40 [00:05<00:02,  5.43it/s]
     441/499      0.206G     0.02129    0.008314    0.01931          1          320:
72%|#######2   | 29/40 [00:05<00:02,  5.43it/s]
     441/499      0.206G     0.02129    0.008314    0.01931          1          320:
75%|#######5   | 30/40 [00:05<00:01,  5.51it/s]
     441/499      0.206G     0.02179    0.008297    0.01944          3          320:
75%|#######5   | 30/40 [00:05<00:01,  5.51it/s]
     441/499      0.206G     0.02179    0.008297    0.01944          3          320:
78%|#######7   | 31/40 [00:05<00:01,  5.45it/s]
     441/499      0.206G     0.02142    0.008165    0.01934          1          320:
78%|#######7   | 31/40 [00:05<00:01,  5.45it/s]
     441/499      0.206G     0.02142    0.008165    0.01934          1          320:
80%|########   | 32/40 [00:05<00:01,  5.41it/s]
     441/499      0.206G     0.0221     0.008398    0.01976          2          320:
80%|########   | 32/40 [00:05<00:01,  5.41it/s]
     441/499      0.206G     0.0221     0.008398    0.01976          2          320:
82%|########2  | 33/40 [00:05<00:01,  5.52it/s]
     441/499      0.206G     0.02198    0.008372    0.0199           2          320:
82%|########2  | 33/40 [00:06<00:01,  5.52it/s]
     441/499      0.206G     0.02198    0.008372    0.0199           2          320:
85%|########5  | 34/40 [00:06<00:01,  5.76it/s]
     441/499      0.206G     0.02171    0.008217    0.01975          1          320:
85%|########5  | 34/40 [00:06<00:01,  5.76it/s]
     441/499      0.206G     0.02171    0.008217    0.01975          1          320:
88%|########7  | 35/40 [00:06<00:00,  5.61it/s]
     441/499      0.206G     0.02197    0.008319    0.02             4          320:
88%|########7  | 35/40 [00:06<00:00,  5.61it/s]
     441/499      0.206G     0.02197    0.008319    0.02             4          320:
90%|######### | 36/40 [00:06<00:00,  5.38it/s]
     441/499      0.206G     0.0216     0.00817     0.01984          1          320:
90%|######### | 36/40 [00:06<00:00,  5.38it/s]
     441/499      0.206G     0.0216     0.00817     0.01984          1          320:
92%|#########2| 37/40 [00:06<00:00,  5.51it/s]
     441/499      0.206G     0.02178    0.008512    0.01988          4          320:
92%|#########2| 37/40 [00:06<00:00,  5.51it/s]
     441/499      0.206G     0.02178    0.008512    0.01988          4          320:
95%|#########5| 38/40 [00:06<00:00,  5.58it/s]
     441/499      0.206G     0.0215     0.008491    0.01974          2          320:
95%|#########5| 38/40 [00:06<00:00,  5.58it/s]
     441/499      0.206G     0.0215     0.008491    0.01974          2          320:
98%|#########7| 39/40 [00:06<00:00,  5.50it/s]
     441/499      0.206G     0.0215     0.008661    0.01986          4          320:
98%|#########7| 39/40 [00:07<00:00,  5.50it/s]
     441/499      0.206G     0.0215     0.008661    0.01986          4          320:
100%|##########| 40/40 [00:07<00:00,  5.44it/s]
     441/499      0.206G     0.0215     0.008661    0.01986          4          320:
100%|##########| 40/40 [00:07<00:00,  5.61it/s]
```

```
              Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:01, 17.87it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:00, 18.10it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 18.19it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 17.26it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####        | 10/20 [00:00<00:00, 17.61it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######       | 12/20 [00:00<00:00, 17.90it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######      | 14/20 [00:00<00:00, 18.03it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########     | 16/20 [00:00<00:00, 17.33it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 18.04it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.73it/s]
                all        40         40      0.978      0.975      0.988
0.809


      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|              | 0/40 [00:00<?, ?it/s]
    442/499     0.206G    0.04056   0.009625    0.02011          3       320:
0%|         | 0/40 [00:00<?, ?it/s]
    442/499     0.206G    0.04056   0.009625    0.02011          3       320:
2%|2        | 1/40 [00:00<00:06,  5.82it/s]
    442/499     0.206G    0.02621   0.006535    0.01703          1       320:
2%|2        | 1/40 [00:00<00:06,  5.82it/s]
    442/499     0.206G    0.02621   0.006535    0.01703          1       320:
5%|5        | 2/40 [00:00<00:06,  5.77it/s]
    442/499     0.206G    0.02096   0.007216    0.01586          2       320:
5%|5        | 2/40 [00:00<00:06,  5.77it/s]
    442/499     0.206G    0.02096   0.007216    0.01586          2       320:
8%|7        | 3/40 [00:00<00:06,  5.79it/s]
    442/499     0.206G    0.02555   0.007672    0.01985          2       320:
8%|7        | 3/40 [00:00<00:06,  5.79it/s]
    442/499     0.206G    0.02555   0.007672    0.01985          2       320:
10%|#        | 4/40 [00:00<00:06,  5.42it/s]
    442/499     0.206G    0.03201   0.007419    0.01987          2       320:
10%|#        | 4/40 [00:00<00:06,  5.42it/s]
    442/499     0.206G    0.03201   0.007419    0.01987          2       320:
12%|#2       | 5/40 [00:00<00:06,  5.37it/s]
```

```
    442/499      0.206G     0.03042    0.007546     0.02012          2          320:
12%|#2         | 5/40 [00:01<00:06,  5.37it/s]
    442/499      0.206G     0.03042    0.007546     0.02012          2          320:
15%|#5         | 6/40 [00:01<00:06,  5.51it/s]
    442/499      0.206G     0.02803    0.007824     0.02059          2          320:
15%|#5         | 6/40 [00:01<00:06,  5.51it/s]
    442/499      0.206G     0.02803    0.007824     0.02059          2          320:
18%|#7         | 7/40 [00:01<00:05,  5.61it/s]
    442/499      0.206G     0.02598      0.0073     0.01997          1          320:
18%|#7         | 7/40 [00:01<00:05,  5.61it/s]
    442/499      0.206G     0.02598      0.0073     0.01997          1          320:
20%|##         | 8/40 [00:01<00:05,  5.65it/s]
    442/499      0.206G     0.02464    0.007447     0.01998          2          320:
20%|##         | 8/40 [00:01<00:05,  5.65it/s]
    442/499      0.206G     0.02464    0.007447     0.01998          2          320:
22%|##2        | 9/40 [00:01<00:05,  5.70it/s]
    442/499      0.206G     0.02521    0.008273     0.02024          4          320:
22%|##2        | 9/40 [00:01<00:05,  5.70it/s]
    442/499      0.206G     0.02521    0.008273     0.02024          4          320:
25%|##5        | 10/40 [00:01<00:05,  5.58it/s]
    442/499      0.206G     0.02371    0.008139     0.02002          2          320:
25%|##5        | 10/40 [00:01<00:05,  5.58it/s]
    442/499      0.206G     0.02371    0.008139     0.02002          2          320:
28%|##7        | 11/40 [00:01<00:05,  5.48it/s]
    442/499      0.206G     0.02322     0.00777     0.01951          1          320:
28%|##7        | 11/40 [00:02<00:05,  5.48it/s]
    442/499      0.206G     0.02322     0.00777     0.01951          1          320:
30%|###        | 12/40 [00:02<00:04,  5.73it/s]
    442/499      0.206G     0.02231    0.007535     0.01891          1          320:
30%|###        | 12/40 [00:02<00:04,  5.73it/s]
    442/499      0.206G     0.02231    0.007535     0.01891          1          320:
32%|###2       | 13/40 [00:02<00:04,  5.61it/s]
    442/499      0.206G      0.0214    0.007402     0.01866          1          320:
32%|###2       | 13/40 [00:02<00:04,  5.61it/s]
    442/499      0.206G      0.0214    0.007402     0.01866          1          320:
35%|###5       | 14/40 [00:02<00:04,  5.66it/s]
    442/499      0.206G      0.0208     0.00734     0.01859          2          320:
35%|###5       | 14/40 [00:02<00:04,  5.66it/s]
    442/499      0.206G      0.0208     0.00734     0.01859          2          320:
38%|###7       | 15/40 [00:02<00:04,  5.87it/s]
    442/499      0.206G     0.01975    0.007096     0.01826          1          320:
38%|###7       | 15/40 [00:02<00:04,  5.87it/s]
    442/499      0.206G     0.01975    0.007096     0.01826          1          320:
40%|####       | 16/40 [00:02<00:04,  5.69it/s]
    442/499      0.206G     0.01935    0.006881     0.01808          1          320:
40%|####       | 16/40 [00:03<00:04,  5.69it/s]
    442/499      0.206G     0.01935    0.006881     0.01808          1          320:
42%|####2      | 17/40 [00:03<00:04,  5.71it/s]
```

```
     442/499      0.206G    0.02065    0.007108    0.01815           3           320:
42%|####2    | 17/40 [00:03<00:04,  5.71it/s]
     442/499      0.206G    0.02065    0.007108    0.01815           3           320:
45%|####5    | 18/40 [00:03<00:03,  5.59it/s]
     442/499      0.206G    0.02133    0.00764     0.01843           4           320:
45%|####5    | 18/40 [00:03<00:03,  5.59it/s]
     442/499      0.206G    0.02133    0.00764     0.01843           4           320:
48%|####7    | 19/40 [00:03<00:03,  5.36it/s]
     442/499      0.206G    0.02171    0.007814    0.01842           2           320:
48%|####7    | 19/40 [00:03<00:03,  5.36it/s]
     442/499      0.206G    0.02171    0.007814    0.01842           2           320:
50%|#####    | 20/40 [00:03<00:03,  5.35it/s]
     442/499      0.206G    0.02156    0.007768    0.01839           2           320:
50%|#####    | 20/40 [00:03<00:03,  5.35it/s]
     442/499      0.206G    0.02156    0.007768    0.01839           2           320:
52%|#####2   | 21/40 [00:03<00:03,  5.63it/s]
     442/499      0.206G     0.0224    0.00775     0.01896           2           320:
52%|#####2   | 21/40 [00:03<00:03,  5.63it/s]
     442/499      0.206G     0.0224    0.00775     0.01896           2           320:
55%|#####5   | 22/40 [00:03<00:03,  5.40it/s]
     442/499      0.206G    0.02177    0.007588    0.01896           1           320:
55%|#####5   | 22/40 [00:04<00:03,  5.40it/s]
     442/499      0.206G    0.02177    0.007588    0.01896           1           320:
57%|#####7   | 23/40 [00:04<00:03,  5.49it/s]
     442/499      0.206G    0.02157    0.007752    0.01887           4           320:
57%|#####7   | 23/40 [00:04<00:03,  5.49it/s]
     442/499      0.206G    0.02157    0.007752    0.01887           4           320:
60%|######   | 24/40 [00:04<00:03,  5.18it/s]
     442/499      0.206G    0.02131    0.007813    0.01909           4           320:
60%|######   | 24/40 [00:04<00:03,  5.18it/s]
     442/499      0.206G    0.02131    0.007813    0.01909           4           320:
62%|######2  | 25/40 [00:04<00:02,  5.08it/s]
     442/499      0.206G    0.02149    0.008163    0.01937           4           320:
62%|######2  | 25/40 [00:04<00:02,  5.08it/s]
     442/499      0.206G    0.02149    0.008163    0.01937           4           320:
65%|######5  | 26/40 [00:04<00:02,  5.03it/s]
     442/499      0.206G     0.0211    0.008034    0.01928           1           320:
65%|######5  | 26/40 [00:04<00:02,  5.03it/s]
     442/499      0.206G     0.0211    0.008034    0.01928           1           320:
68%|######7  | 27/40 [00:04<00:02,  4.89it/s]
     442/499      0.206G    0.02132    0.008348    0.01953           4           320:
68%|######7  | 27/40 [00:05<00:02,  4.89it/s]
     442/499      0.206G    0.02132    0.008348    0.01953           4           320:
70%|####### | 28/40 [00:05<00:02,  4.88it/s]
     442/499      0.206G    0.02132    0.008502    0.01944           4           320:
70%|####### | 28/40 [00:05<00:02,  4.88it/s]
     442/499      0.206G    0.02132    0.008502    0.01944           4           320:
72%|#######2 | 29/40 [00:05<00:02,  4.78it/s]
```

```
     442/499      0.206G     0.02114    0.008666      0.01959            4           320:
72%|#######2  | 29/40 [00:05<00:02,  4.78it/s]
     442/499      0.206G     0.02114    0.008666      0.01959            4           320:
75%|#######5  | 30/40 [00:05<00:02,  4.81it/s]
     442/499      0.206G     0.02068    0.008512      0.01931            1           320:
75%|#######5  | 30/40 [00:05<00:02,  4.81it/s]
     442/499      0.206G     0.02068    0.008512      0.01931            1           320:
78%|#######7  | 31/40 [00:05<00:01,  4.96it/s]
     442/499      0.206G     0.02039    0.008523      0.01915            4           320:
78%|#######7  | 31/40 [00:05<00:01,  4.96it/s]
     442/499      0.206G     0.02039    0.008523      0.01915            4           320:
80%|########  | 32/40 [00:05<00:01,  5.06it/s]
     442/499      0.206G     0.02038    0.008511      0.01906            2           320:
80%|########  | 32/40 [00:06<00:01,  5.06it/s]
     442/499      0.206G     0.02038    0.008511      0.01906            2           320:
82%|########2 | 33/40 [00:06<00:01,  5.01it/s]
     442/499      0.206G     0.02017    0.008402      0.01885            1           320:
82%|########2 | 33/40 [00:06<00:01,  5.01it/s]
     442/499      0.206G     0.02017    0.008402      0.01885            1           320:
85%|########5 | 34/40 [00:06<00:01,  4.87it/s]
     442/499      0.206G     0.02068    0.008405      0.01901            2           320:
85%|########5 | 34/40 [00:06<00:01,  4.87it/s]
     442/499      0.206G     0.02068    0.008405      0.01901            2           320:
88%|########7 | 35/40 [00:06<00:01,  4.77it/s]
     442/499      0.206G     0.02032    0.008252      0.01886            1           320:
88%|########7 | 35/40 [00:06<00:01,  4.77it/s]
     442/499      0.206G     0.02032    0.008252      0.01886            1           320:
90%|######### | 36/40 [00:06<00:00,  4.93it/s]
     442/499      0.206G     0.02011    0.008351      0.01888            2           320:
90%|######### | 36/40 [00:06<00:00,  4.93it/s]
     442/499      0.206G     0.02011    0.008351      0.01888            2           320:
92%|#########2| 37/40 [00:06<00:00,  5.04it/s]
     442/499      0.206G     0.01975    0.008334      0.01879            2           320:
92%|#########2| 37/40 [00:07<00:00,  5.04it/s]
     442/499      0.206G     0.01975    0.008334      0.01879            2           320:
95%|#########5| 38/40 [00:07<00:00,  4.88it/s]
     442/499      0.206G     0.01951    0.008329      0.01883            2           320:
95%|#########5| 38/40 [00:07<00:00,  4.88it/s]
     442/499      0.206G     0.01951    0.008329      0.01883            2           320:
98%|#########7| 39/40 [00:07<00:00,  5.12it/s]
     442/499      0.206G     0.01933    0.008479      0.01885            2           320:
98%|#########7| 39/40 [00:07<00:00,  5.12it/s]
     442/499      0.206G     0.01933    0.008479      0.01885            2           320:
100%|##########| 40/40 [00:07<00:00,  5.19it/s]
     442/499      0.206G     0.01933    0.008479      0.01885            2           320:
100%|##########| 40/40 [00:07<00:00,  5.28it/s]

              Class      Images  Instances           P           R       mAP50
```

```
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:00, 18.08it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:00, 18.18it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 16.13it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 15.32it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 16.13it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 16.08it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 16.74it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:00<00:00, 17.20it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.52it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.30it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.54it/s]
                all         40         40      0.978      0.975      0.988
0.809


      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|             | 0/40 [00:00<?, ?it/s]
    443/499     0.206G   0.008112     0.0104     0.0174          2        320:
0%|            | 0/40 [00:00<?, ?it/s]
    443/499     0.206G   0.008112     0.0104     0.0174          2        320:
2%|2           | 1/40 [00:00<00:06,  5.76it/s]
    443/499     0.206G    0.01897   0.008935    0.01737          4        320:
2%|2           | 1/40 [00:00<00:06,  5.76it/s]
    443/499     0.206G    0.01897   0.008935    0.01737          4        320:
5%|5           | 2/40 [00:00<00:06,  5.80it/s]
    443/499     0.206G    0.01539   0.009311    0.01685          4        320:
5%|5           | 2/40 [00:00<00:06,  5.80it/s]
    443/499     0.206G    0.01539   0.009311    0.01685          4        320:
8%|7           | 3/40 [00:00<00:06,  5.81it/s]
    443/499     0.206G    0.02327   0.009378    0.01984          3        320:
8%|7           | 3/40 [00:00<00:06,  5.81it/s]
    443/499     0.206G    0.02327   0.009378    0.01984          3        320:
10%|#           | 4/40 [00:00<00:06,  5.58it/s]
    443/499     0.206G    0.02082   0.008104    0.01892          1        320:
10%|#           | 4/40 [00:00<00:06,  5.58it/s]
    443/499     0.206G    0.02082   0.008104    0.01892          1        320:
```

110

```
12%|#2        | 5/40 [00:00<00:06,  5.49it/s]
    443/499    0.206G    0.01952    0.007788    0.01867        2        320:
12%|#2        | 5/40 [00:01<00:06,  5.49it/s]
    443/499    0.206G    0.01952    0.007788    0.01867        2        320:
15%|#5        | 6/40 [00:01<00:05,  5.77it/s]
    443/499    0.206G    0.01774    0.00714     0.01794        1        320:
15%|#5        | 6/40 [00:01<00:05,  5.77it/s]
    443/499    0.206G    0.01774    0.00714     0.01794        1        320:
18%|#7        | 7/40 [00:01<00:05,  5.78it/s]
    443/499    0.206G    0.01767    0.007723    0.01777        2        320:
18%|#7        | 7/40 [00:01<00:05,  5.78it/s]
    443/499    0.206G    0.01767    0.007723    0.01777        2        320:
20%|##        | 8/40 [00:01<00:05,  5.79it/s]
    443/499    0.206G    0.01714    0.008176    0.01767        4        320:
20%|##        | 8/40 [00:01<00:05,  5.79it/s]
    443/499    0.206G    0.01714    0.008176    0.01767        4        320:
22%|##2       | 9/40 [00:01<00:05,  5.49it/s]
    443/499    0.206G    0.01638    0.008137    0.01745        2        320:
22%|##2       | 9/40 [00:01<00:05,  5.49it/s]
    443/499    0.206G    0.01638    0.008137    0.01745        2        320:
25%|##5       | 10/40 [00:01<00:05,  5.72it/s]
    443/499    0.206G    0.01688    0.008608    0.01741        4        320:
25%|##5       | 10/40 [00:01<00:05,  5.72it/s]
    443/499    0.206G    0.01688    0.008608    0.01741        4        320:
28%|##7       | 11/40 [00:01<00:05,  5.59it/s]
    443/499    0.206G    0.01617    0.008194    0.01699        1        320:
28%|##7       | 11/40 [00:02<00:05,  5.59it/s]
    443/499    0.206G    0.01617    0.008194    0.01699        1        320:
30%|###       | 12/40 [00:02<00:05,  5.37it/s]
    443/499    0.206G    0.01671    0.008284    0.01891        2        320:
30%|###       | 12/40 [00:02<00:05,  5.37it/s]
    443/499    0.206G    0.01671    0.008284    0.01891        2        320:
32%|###2      | 13/40 [00:02<00:05,  5.34it/s]
    443/499    0.206G    0.01674    0.008181    0.01899        2        320:
32%|###2      | 13/40 [00:02<00:05,  5.34it/s]
    443/499    0.206G    0.01674    0.008181    0.01899        2        320:
35%|###5      | 14/40 [00:02<00:04,  5.48it/s]
    443/499    0.206G    0.0168     0.008085    0.01877        1        320:
35%|###5      | 14/40 [00:02<00:04,  5.48it/s]
    443/499    0.206G    0.0168     0.008085    0.01877        1        320:
38%|###7      | 15/40 [00:02<00:04,  5.58it/s]
    443/499    0.206G    0.01636    0.007953    0.01861        2        320:
38%|###7      | 15/40 [00:02<00:04,  5.58it/s]
    443/499    0.206G    0.01636    0.007953    0.01861        2        320:
40%|####      | 16/40 [00:02<00:04,  5.62it/s]
    443/499    0.206G    0.01637    0.007663    0.01849        1        320:
40%|####      | 16/40 [00:03<00:04,  5.62it/s]
    443/499    0.206G    0.01637    0.007663    0.01849        1        320:
```

111

```
42%|####2      | 17/40 [00:03<00:04,  5.67it/s]
    443/499     0.206G    0.01844    0.007879    0.01861         2         320:
42%|####2      | 17/40 [00:03<00:04,  5.67it/s]
    443/499     0.206G    0.01844    0.007879    0.01861         2         320:
45%|####5      | 18/40 [00:03<00:03,  5.57it/s]
    443/499     0.206G    0.01834    0.007906    0.01838         2         320:
45%|####5      | 18/40 [00:03<00:03,  5.57it/s]
    443/499     0.206G    0.01834    0.007906    0.01838         2         320:
48%|####7      | 19/40 [00:03<00:03,  5.65it/s]
    443/499     0.206G    0.01967    0.008231     0.0185         4         320:
48%|####7      | 19/40 [00:03<00:03,  5.65it/s]
    443/499     0.206G    0.01967    0.008231     0.0185         4         320:
50%|#####      | 20/40 [00:03<00:03,  5.55it/s]
    443/499     0.206G    0.01902     0.00797    0.01831         1         320:
50%|#####      | 20/40 [00:03<00:03,  5.55it/s]
    443/499     0.206G    0.01902     0.00797    0.01831         1         320:
52%|#####2     | 21/40 [00:03<00:03,  5.48it/s]
    443/499     0.206G    0.01845    0.007807    0.01801         1         320:
52%|#####2     | 21/40 [00:03<00:03,  5.48it/s]
    443/499     0.206G    0.01845    0.007807    0.01801         1         320:
55%|#####5     | 22/40 [00:03<00:03,  5.71it/s]
    443/499     0.206G    0.01856     0.00815    0.01841         4         320:
55%|#####5     | 22/40 [00:04<00:03,  5.71it/s]
    443/499     0.206G    0.01856     0.00815    0.01841         4         320:
57%|#####7     | 23/40 [00:04<00:03,  5.59it/s]
    443/499     0.206G    0.01882     0.00845    0.01866         4         320:
57%|#####7     | 23/40 [00:04<00:03,  5.59it/s]
    443/499     0.206G    0.01882     0.00845    0.01866         4         320:
60%|######     | 24/40 [00:04<00:02,  5.51it/s]
    443/499     0.206G    0.01944    0.008551    0.01938         2         320:
60%|######     | 24/40 [00:04<00:02,  5.51it/s]
    443/499     0.206G    0.01944    0.008551    0.01938         2         320:
62%|######2    | 25/40 [00:04<00:02,  5.43it/s]
    443/499     0.206G    0.01921     0.00837    0.01918         1         320:
62%|######2    | 25/40 [00:04<00:02,  5.43it/s]
    443/499     0.206G    0.01921     0.00837    0.01918         1         320:
65%|######5    | 26/40 [00:04<00:02,  5.54it/s]
    443/499     0.206G    0.01927    0.008532    0.01907         4         320:
65%|######5    | 26/40 [00:04<00:02,  5.54it/s]
    443/499     0.206G    0.01927    0.008532    0.01907         4         320:
68%|######7    | 27/40 [00:04<00:02,  5.48it/s]
    443/499     0.206G    0.01953    0.008478    0.01924         2         320:
68%|######7    | 27/40 [00:05<00:02,  5.48it/s]
    443/499     0.206G    0.01953    0.008478    0.01924         2         320:
70%|#######    | 28/40 [00:05<00:02,  5.42it/s]
    443/499     0.206G    0.01914    0.008405    0.01913         2         320:
70%|#######    | 28/40 [00:05<00:02,  5.42it/s]
    443/499     0.206G    0.01914    0.008405    0.01913         2         320:
```

```
72%|#######2   | 29/40 [00:05<00:02,  5.39it/s]
    443/499    0.206G    0.02028    0.008308    0.01915        2        320:
72%|#######2   | 29/40 [00:05<00:02,  5.39it/s]
    443/499    0.206G    0.02028    0.008308    0.01915        2        320:
75%|#######5   | 30/40 [00:05<00:01,  5.36it/s]
    443/499    0.206G    0.02138    0.008364    0.01909        2        320:
75%|#######5   | 30/40 [00:05<00:01,  5.36it/s]
    443/499    0.206G    0.02138    0.008364    0.01909        2        320:
78%|#######7   | 31/40 [00:05<00:01,  5.35it/s]
    443/499    0.206G    0.02182    0.008319    0.01901        2        320:
78%|#######7   | 31/40 [00:05<00:01,  5.35it/s]
    443/499    0.206G    0.02182    0.008319    0.01901        2        320:
80%|########   | 32/40 [00:05<00:01,  5.34it/s]
    443/499    0.206G    0.02261    0.008235    0.01898        2        320:
80%|########   | 32/40 [00:05<00:01,  5.34it/s]
    443/499    0.206G    0.02261    0.008235    0.01898        2        320:
82%|########2  | 33/40 [00:05<00:01,  5.46it/s]
    443/499    0.206G    0.02228    0.008084    0.01885        1        320:
82%|########2  | 33/40 [00:06<00:01,  5.46it/s]
    443/499    0.206G    0.02228    0.008084    0.01885        1        320:
85%|########5  | 34/40 [00:06<00:01,  5.56it/s]
    443/499    0.206G    0.02237    0.008224    0.01886        4        320:
85%|########5  | 34/40 [00:06<00:01,  5.56it/s]
    443/499    0.206G    0.02237    0.008224    0.01886        4        320:
88%|########7  | 35/40 [00:06<00:00,  5.63it/s]
    443/499    0.206G    0.02219    0.008119     0.0192        1        320:
88%|########7  | 35/40 [00:06<00:00,  5.63it/s]
    443/499    0.206G    0.02219    0.008119     0.0192        1        320:
90%|######### | 36/40 [00:06<00:00,  5.67it/s]
    443/499    0.206G    0.02173    0.008001    0.01912        1        320:
90%|######### | 36/40 [00:06<00:00,  5.67it/s]
    443/499    0.206G    0.02173    0.008001    0.01912        1        320:
92%|#########2| 37/40 [00:06<00:00,  5.73it/s]
    443/499    0.206G    0.02142    0.007908    0.01894        1        320:
92%|#########2| 37/40 [00:06<00:00,  5.73it/s]
    443/499    0.206G    0.02142    0.007908    0.01894        1        320:
95%|#########5| 38/40 [00:06<00:00,  5.61it/s]
    443/499    0.206G    0.02112    0.007789    0.01883        1        320:
95%|#########5| 38/40 [00:06<00:00,  5.61it/s]
    443/499    0.206G    0.02112    0.007789    0.01883        1        320:
98%|#########7| 39/40 [00:06<00:00,  5.82it/s]
    443/499    0.206G    0.02091    0.007728    0.01881        2        320:
98%|#########7| 39/40 [00:07<00:00,  5.82it/s]
    443/499    0.206G    0.02091    0.007728    0.01881        2        320:
100%|##########| 40/40 [00:07<00:00,  5.50it/s]
    443/499    0.206G    0.02091    0.007728    0.01881        2        320:
100%|##########| 40/40 [00:07<00:00,  5.56it/s]
```

```
               Class      Images  Instances         P          R       mAP50
mAP50-95:    0%|          | 0/20 [00:00<?, ?it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:   10%|#         | 2/20 [00:00<00:01, 16.00it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:   20%|##        | 4/20 [00:00<00:00, 17.26it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:   30%|###       | 6/20 [00:00<00:00, 16.29it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:   40%|####      | 8/20 [00:00<00:00, 17.18it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:   55%|#####5    | 11/20 [00:00<00:00, 18.05it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:   65%|######5   | 13/20 [00:00<00:00, 18.12it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:   75%|#######5  | 15/20 [00:00<00:00, 17.43it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:   85%|########5 | 17/20 [00:00<00:00, 16.93it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:   95%|#########5| 19/20 [00:01<00:00, 16.64it/s]
               Class      Images  Instances         P          R       mAP50
mAP50-95:  100%|##########| 20/20 [00:01<00:00, 17.24it/s]
                 all         40         40       0.97      0.972      0.989
0.805
```

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances	Size

```
  0%|          | 0/40 [00:00<?, ?it/s]
    444/499     0.206G     0.01397    0.003674     0.02288            1       320:
0%|          | 0/40 [00:00<?, ?it/s]
    444/499     0.206G     0.01397    0.003674     0.02288            1       320:
2%|2        | 1/40 [00:00<00:06,  6.40it/s]
    444/499     0.206G     0.01561    0.009258     0.02768            4       320:
2%|2        | 1/40 [00:00<00:06,  6.40it/s]
    444/499     0.206G     0.01561    0.009258     0.02768            4       320:
5%|5        | 2/40 [00:00<00:06,  6.04it/s]
    444/499     0.206G      0.0199    0.008701     0.02864            2       320:
5%|5        | 2/40 [00:00<00:06,  6.04it/s]
    444/499     0.206G      0.0199    0.008701     0.02864            2       320:
8%|7        | 3/40 [00:00<00:07,  5.26it/s]
    444/499     0.206G     0.02108     0.01005     0.02714            4       320:
8%|7        | 3/40 [00:00<00:07,  5.26it/s]
    444/499     0.206G     0.02108     0.01005     0.02714            4       320:
10%|#        | 4/40 [00:00<00:06,  5.29it/s]
    444/499     0.206G     0.01828    0.008605     0.02458            1       320:
10%|#        | 4/40 [00:00<00:06,  5.29it/s]
    444/499     0.206G     0.01828    0.008605     0.02458            1       320:
12%|#2       | 5/40 [00:00<00:06,  5.41it/s]
```

```
    444/499      0.206G    0.01741    0.00819    0.02341          2          320:
12%|#2          | 5/40 [00:01<00:06,  5.41it/s]
    444/499      0.206G    0.01741    0.00819    0.02341          2          320:
15%|#5          | 6/40 [00:01<00:06,  5.57it/s]
    444/499      0.206G    0.01604    0.007555   0.02213          1          320:
15%|#5          | 6/40 [00:01<00:06,  5.57it/s]
    444/499      0.206G    0.01604    0.007555   0.02213          1          320:
18%|#7          | 7/40 [00:01<00:05,  5.82it/s]
    444/499      0.206G    0.01479    0.00697    0.02094          1          320:
18%|#7          | 7/40 [00:01<00:05,  5.82it/s]
    444/499      0.206G    0.01479    0.00697    0.02094          1          320:
20%|##          | 8/40 [00:01<00:05,  5.80it/s]
    444/499      0.206G    0.01543    0.007875   0.02076          4          320:
20%|##          | 8/40 [00:01<00:05,  5.80it/s]
    444/499      0.206G    0.01543    0.007875   0.02076          4          320:
22%|##2         | 9/40 [00:01<00:05,  5.64it/s]
    444/499      0.206G    0.01712    0.008555   0.02186          4          320:
22%|##2         | 9/40 [00:01<00:05,  5.64it/s]
    444/499      0.206G    0.01712    0.008555   0.02186          4          320:
25%|##5         | 10/40 [00:01<00:05,  5.54it/s]
    444/499      0.206G    0.01638    0.008198   0.02134          2          320:
25%|##5         | 10/40 [00:01<00:05,  5.54it/s]
    444/499      0.206G    0.01638    0.008198   0.02134          2          320:
28%|##7         | 11/40 [00:01<00:05,  5.58it/s]
    444/499      0.206G    0.01615    0.007805   0.02064          1          320:
28%|##7         | 11/40 [00:02<00:05,  5.58it/s]
    444/499      0.206G    0.01615    0.007805   0.02064          1          320:
30%|###         | 12/40 [00:02<00:04,  5.67it/s]
    444/499      0.206G    0.01671    0.00868    0.02069          4          320:
30%|###         | 12/40 [00:02<00:04,  5.67it/s]
    444/499      0.206G    0.01671    0.00868    0.02069          4          320:
32%|###2        | 13/40 [00:02<00:04,  5.42it/s]
    444/499      0.206G    0.01627    0.008459   0.02017          1          320:
32%|###2        | 13/40 [00:02<00:04,  5.42it/s]
    444/499      0.206G    0.01627    0.008459   0.02017          1          320:
35%|###5        | 14/40 [00:02<00:04,  5.38it/s]
    444/499      0.206G    0.01565    0.008069   0.01957          1          320:
35%|###5        | 14/40 [00:02<00:04,  5.38it/s]
    444/499      0.206G    0.01565    0.008069   0.01957          1          320:
38%|###7        | 15/40 [00:02<00:04,  5.23it/s]
    444/499      0.206G    0.01619    0.008215   0.01939          3          320:
38%|###7        | 15/40 [00:02<00:04,  5.23it/s]
    444/499      0.206G    0.01619    0.008215   0.01939          3          320:
40%|####        | 16/40 [00:02<00:04,  5.01it/s]
    444/499      0.206G    0.01753    0.008154   0.01962          2          320:
40%|####        | 16/40 [00:03<00:04,  5.01it/s]
    444/499      0.206G    0.01753    0.008154   0.01962          2          320:
42%|####2       | 17/40 [00:03<00:04,  4.98it/s]
```

```
    444/499      0.206G    0.01768    0.008574      0.01973          4           320:
42%|####2     | 17/40 [00:03<00:04,  4.98it/s]
    444/499      0.206G    0.01768    0.008574      0.01973          4           320:
45%|####5     | 18/40 [00:03<00:04,  4.96it/s]
    444/499      0.206G    0.01734    0.008266      0.01947          1           320:
45%|####5     | 18/40 [00:03<00:04,  4.96it/s]
    444/499      0.206G    0.01734    0.008266      0.01947          1           320:
48%|####7     | 19/40 [00:03<00:04,  4.86it/s]
    444/499      0.206G    0.01953    0.008033      0.02041          2           320:
48%|####7     | 19/40 [00:03<00:04,  4.86it/s]
    444/499      0.206G    0.01953    0.008033      0.02041          2           320:
50%|#####     | 20/40 [00:03<00:04,  4.85it/s]
    444/499      0.206G    0.01956    0.008338      0.02065          4           320:
50%|#####     | 20/40 [00:03<00:04,  4.85it/s]
    444/499      0.206G    0.01956    0.008338      0.02065          4           320:
52%|#####2    | 21/40 [00:03<00:03,  4.76it/s]
    444/499      0.206G    0.01951    0.008155      0.02043          2           320:
52%|#####2    | 21/40 [00:04<00:03,  4.76it/s]
    444/499      0.206G    0.01951    0.008155      0.02043          2           320:
55%|#####5    | 22/40 [00:04<00:03,  4.90it/s]
    444/499      0.206G    0.01866    0.007931      0.01955          0           320:
55%|#####5    | 22/40 [00:04<00:03,  4.90it/s]
    444/499      0.206G    0.01866    0.007931      0.01955          0           320:
57%|#####7    | 23/40 [00:04<00:03,  5.27it/s]
    444/499      0.206G    0.01906    0.007975      0.01947          2           320:
57%|#####7    | 23/40 [00:04<00:03,  5.27it/s]
    444/499      0.206G    0.01906    0.007975      0.01947          2           320:
60%|######    | 24/40 [00:04<00:03,  5.16it/s]
    444/499      0.206G    0.01863    0.007811       0.0193          1           320:
60%|######    | 24/40 [00:04<00:03,  5.16it/s]
    444/499      0.206G    0.01863    0.007811       0.0193          1           320:
62%|######2   | 25/40 [00:04<00:02,  5.08it/s]
    444/499      0.206G    0.01854    0.007684      0.01906          1           320:
62%|######2   | 25/40 [00:04<00:02,  5.08it/s]
    444/499      0.206G    0.01854    0.007684      0.01906          1           320:
65%|######5   | 26/40 [00:04<00:02,  5.15it/s]
    444/499      0.206G    0.01897    0.007575      0.01883          1           320:
65%|######5   | 26/40 [00:05<00:02,  5.15it/s]
    444/499      0.206G    0.01897    0.007575      0.01883          1           320:
68%|######7   | 27/40 [00:05<00:02,  5.06it/s]
    444/499      0.206G    0.01861    0.007404      0.01861          1           320:
68%|######7   | 27/40 [00:05<00:02,  5.06it/s]
    444/499      0.206G    0.01861    0.007404      0.01861          1           320:
70%|#######   | 28/40 [00:05<00:02,  5.14it/s]
    444/499      0.206G    0.01834    0.007331      0.01851          2           320:
70%|#######   | 28/40 [00:05<00:02,  5.14it/s]
    444/499      0.206G    0.01834    0.007331      0.01851          2           320:
72%|#######2  | 29/40 [00:05<00:02,  5.47it/s]
```

116

```
    444/499      0.206G     0.01809    0.007358      0.01835          2          320:
72%|#######2  | 29/40 [00:05<00:02,  5.47it/s]
    444/499      0.206G     0.01809    0.007358      0.01835          2          320:
75%|#######5  | 30/40 [00:05<00:01,  5.29it/s]
    444/499      0.206G      0.0185    0.007707      0.01842          4          320:
75%|#######5  | 30/40 [00:05<00:01,  5.29it/s]
    444/499      0.206G      0.0185    0.007707      0.01842          4          320:
78%|#######7  | 31/40 [00:05<00:01,  5.30it/s]
    444/499      0.206G      0.0191    0.008039       0.0185          4          320:
78%|#######7  | 31/40 [00:06<00:01,  5.30it/s]
    444/499      0.206G      0.0191    0.008039       0.0185          4          320:
80%|########  | 32/40 [00:06<00:01,  5.45it/s]
    444/499      0.206G     0.01885    0.007926       0.0183          1          320:
80%|########  | 32/40 [00:06<00:01,  5.45it/s]
    444/499      0.206G     0.01885    0.007926       0.0183          1          320:
82%|########2 | 33/40 [00:06<00:01,  5.53it/s]
    444/499      0.206G      0.0195    0.008025      0.01844          4          320:
82%|########2 | 33/40 [00:06<00:01,  5.53it/s]
    444/499      0.206G      0.0195    0.008025      0.01844          4          320:
85%|########5 | 34/40 [00:06<00:01,  5.61it/s]
    444/499      0.206G     0.01933    0.007987      0.01846          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.61it/s]
    444/499      0.206G     0.01933    0.007987      0.01846          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.52it/s]
    444/499      0.206G     0.01934    0.007901      0.01833          1          320:
88%|########7 | 35/40 [00:06<00:00,  5.52it/s]
    444/499      0.206G     0.01934    0.007901      0.01833          1          320:
90%|######### | 36/40 [00:06<00:00,  5.18it/s]
    444/499      0.206G     0.01939    0.008025      0.01852          4          320:
90%|######### | 36/40 [00:06<00:00,  5.18it/s]
    444/499      0.206G     0.01939    0.008025      0.01852          4          320:
92%|#########2| 37/40 [00:06<00:00,  5.36it/s]
    444/499      0.206G     0.01952    0.008207      0.01865          4          320:
92%|#########2| 37/40 [00:07<00:00,  5.36it/s]
    444/499      0.206G     0.01952    0.008207      0.01865          4          320:
95%|#########5| 38/40 [00:07<00:00,  5.35it/s]
    444/499      0.206G     0.01926    0.008078      0.01864          1          320:
95%|#########5| 38/40 [00:07<00:00,  5.35it/s]
    444/499      0.206G     0.01926    0.008078      0.01864          1          320:
98%|#########7| 39/40 [00:07<00:00,  5.46it/s]
    444/499      0.206G     0.01904     0.00802       0.0185          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.46it/s]
    444/499      0.206G     0.01904     0.00802       0.0185          2          320:
100%|##########| 40/40 [00:07<00:00,  5.57it/s]
    444/499      0.206G     0.01904     0.00802       0.0185          2          320:
100%|##########| 40/40 [00:07<00:00,  5.33it/s]

               Class      Images  Instances           P          R       mAP50
```

```
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:01, 15.99it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:01, 14.76it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 15.25it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 15.54it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95:  50%|#####        | 10/20 [00:00<00:00, 16.43it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95:  65%|######5      | 13/20 [00:00<00:00, 17.01it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95:  75%|#######5     | 15/20 [00:00<00:00, 17.17it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95:  85%|########5    | 17/20 [00:01<00:00, 17.48it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95:  95%|#########5|   19/20 [00:01<00:00, 16.37it/s]
              Class       Images  Instances            P            R       mAP50
mAP50-95: 100%|##########|   20/20 [00:01<00:00, 16.57it/s]
                all         40          40        0.966        0.975        0.992
0.813

      Epoch      GPU_mem    box_loss    obj_loss    cls_loss   Instances        Size

  0%|            | 0/40 [00:00<?, ?it/s]
    445/499      0.206G     0.01705     0.01219     0.01906           4        320:
0%|            | 0/40 [00:00<?, ?it/s]
    445/499      0.206G     0.01705     0.01219     0.01906           4        320:
2%|2           | 1/40 [00:00<00:06,  5.82it/s]
    445/499      0.206G     0.01333    0.007744     0.01507           1        320:
2%|2           | 1/40 [00:00<00:06,  5.82it/s]
    445/499      0.206G     0.01333    0.007744     0.01507           1        320:
5%|5           | 2/40 [00:00<00:06,  5.79it/s]
    445/499      0.206G     0.01974    0.009318     0.01756           4        320:
5%|5           | 2/40 [00:00<00:06,  5.79it/s]
    445/499      0.206G     0.01974    0.009318     0.01756           4        320:
8%|7           | 3/40 [00:00<00:06,  5.79it/s]
    445/499      0.206G     0.01701    0.007732     0.01816           1        320:
8%|7           | 3/40 [00:00<00:06,  5.79it/s]
    445/499      0.206G     0.01701    0.007732     0.01816           1        320:
10%|#           | 4/40 [00:00<00:06,  5.80it/s]
    445/499      0.206G     0.02217    0.008165      0.0203           2        320:
10%|#           | 4/40 [00:00<00:06,  5.80it/s]
    445/499      0.206G     0.02217    0.008165      0.0203           2        320:
12%|#2          | 5/40 [00:00<00:06,  5.66it/s]
    445/499      0.206G     0.02369     0.00935     0.02145           4        320:
```

```
12%|#2         | 5/40 [00:01<00:06,  5.66it/s]
    445/499     0.206G    0.02369     0.00935    0.02145        4        320:
15%|#5         | 6/40 [00:01<00:05,  5.67it/s]
    445/499     0.206G    0.02031    0.008311    0.01839        0        320:
15%|#5         | 6/40 [00:01<00:05,  5.67it/s]
    445/499     0.206G    0.02031    0.008311    0.01839        0        320:
18%|#7         | 7/40 [00:01<00:05,  6.07it/s]
    445/499     0.206G     0.0188    0.007778    0.01763        1        320:
18%|#7         | 7/40 [00:01<00:05,  6.07it/s]
    445/499     0.206G     0.0188    0.007778    0.01763        1        320:
20%|##         | 8/40 [00:01<00:05,  5.97it/s]
    445/499     0.206G    0.01799    0.007213    0.01775        1        320:
20%|##         | 8/40 [00:01<00:05,  5.97it/s]
    445/499     0.206G    0.01799    0.007213    0.01775        1        320:
22%|##2        | 9/40 [00:01<00:05,  5.91it/s]
    445/499     0.206G    0.01798    0.007868    0.01766        4        320:
22%|##2        | 9/40 [00:01<00:05,  5.91it/s]
    445/499     0.206G    0.01798    0.007868    0.01766        4        320:
25%|##5        | 10/40 [00:01<00:05,  5.72it/s]
    445/499     0.206G    0.01881    0.007821    0.01884        2        320:
25%|##5        | 10/40 [00:01<00:05,  5.72it/s]
    445/499     0.206G    0.01881    0.007821    0.01884        2        320:
28%|##7        | 11/40 [00:01<00:05,  5.58it/s]
    445/499     0.206G    0.01839    0.007467    0.01912        1        320:
28%|##7        | 11/40 [00:02<00:05,  5.58it/s]
    445/499     0.206G    0.01839    0.007467    0.01912        1        320:
30%|###        | 12/40 [00:02<00:05,  5.51it/s]
    445/499     0.206G    0.02089     0.00759    0.01876        2        320:
30%|###        | 12/40 [00:02<00:05,  5.51it/s]
    445/499     0.206G    0.02089     0.00759    0.01876        2        320:
32%|###2       | 13/40 [00:02<00:04,  5.60it/s]
    445/499     0.206G    0.02059     0.00751    0.01841        1        320:
32%|###2       | 13/40 [00:02<00:04,  5.60it/s]
    445/499     0.206G    0.02059     0.00751    0.01841        1        320:
35%|###5       | 14/40 [00:02<00:04,  5.63it/s]
    445/499     0.206G    0.01987    0.007225    0.01791        1        320:
35%|###5       | 14/40 [00:02<00:04,  5.63it/s]
    445/499     0.206G    0.01987    0.007225    0.01791        1        320:
38%|###7       | 15/40 [00:02<00:04,  5.70it/s]
    445/499     0.206G    0.01915     0.00697    0.01777        1        320:
38%|###7       | 15/40 [00:02<00:04,  5.70it/s]
    445/499     0.206G    0.01915     0.00697    0.01777        1        320:
40%|####       | 16/40 [00:02<00:04,  5.72it/s]
    445/499     0.206G     0.0217    0.006866    0.01798        2        320:
40%|####       | 16/40 [00:02<00:04,  5.72it/s]
    445/499     0.206G     0.0217    0.006866    0.01798        2        320:
42%|####2      | 17/40 [00:02<00:04,  5.62it/s]
    445/499     0.206G    0.02131    0.006671    0.01817        1        320:
```

```
42%|####2      | 17/40 [00:03<00:04,  5.62it/s]
     445/499     0.206G    0.02131   0.006671    0.01817        1        320:
45%|####5      | 18/40 [00:03<00:03,  5.80it/s]
     445/499     0.206G    0.02101   0.006951    0.01835        4        320:
45%|####5      | 18/40 [00:03<00:03,  5.80it/s]
     445/499     0.206G    0.02101   0.006951    0.01835        4        320:
48%|####7      | 19/40 [00:03<00:03,  5.65it/s]
     445/499     0.206G    0.02111   0.007313    0.01837        4        320:
48%|####7      | 19/40 [00:03<00:03,  5.65it/s]
     445/499     0.206G    0.02111   0.007313    0.01837        4        320:
50%|#####      | 20/40 [00:03<00:03,  5.50it/s]
     445/499     0.206G    0.02113   0.007536    0.01852        4        320:
50%|#####      | 20/40 [00:03<00:03,  5.50it/s]
     445/499     0.206G    0.02113   0.007536    0.01852        4        320:
52%|#####2     | 21/40 [00:03<00:03,  5.63it/s]
     445/499     0.206G    0.02049   0.00732     0.01827        1        320:
52%|#####2     | 21/40 [00:03<00:03,  5.63it/s]
     445/499     0.206G    0.02049   0.00732     0.01827        1        320:
55%|#####5     | 22/40 [00:03<00:03,  5.68it/s]
     445/499     0.206G    0.02009   0.007181    0.01811        1        320:
55%|#####5     | 22/40 [00:04<00:03,  5.68it/s]
     445/499     0.206G    0.02009   0.007181    0.01811        1        320:
57%|#####7     | 23/40 [00:04<00:03,  5.57it/s]
     445/499     0.206G    0.02023   0.007602    0.01814        4        320:
57%|#####7     | 23/40 [00:04<00:03,  5.57it/s]
     445/499     0.206G    0.02023   0.007602    0.01814        4        320:
60%|######     | 24/40 [00:04<00:02,  5.63it/s]
     445/499     0.206G    0.02059   0.007654     0.018         2        320:
60%|######     | 24/40 [00:04<00:02,  5.63it/s]
     445/499     0.206G    0.02059   0.007654     0.018         2        320:
62%|######2    | 25/40 [00:04<00:02,  5.54it/s]
     445/499     0.206G    0.02047   0.007516    0.01809        1        320:
62%|######2    | 25/40 [00:04<00:02,  5.54it/s]
     445/499     0.206G    0.02047   0.007516    0.01809        1        320:
65%|######5    | 26/40 [00:04<00:02,  5.47it/s]
     445/499     0.206G    0.02024   0.007748    0.01882        4        320:
65%|######5    | 26/40 [00:04<00:02,  5.47it/s]
     445/499     0.206G    0.02024   0.007748    0.01882        4        320:
68%|######7    | 27/40 [00:04<00:02,  5.57it/s]
     445/499     0.206G     0.0206   0.007737    0.01885        2        320:
68%|######7    | 27/40 [00:04<00:02,  5.57it/s]
     445/499     0.206G     0.0206   0.007737    0.01885        2        320:
70%|#######    | 28/40 [00:04<00:02,  5.50it/s]
     445/499     0.206G    0.02019   0.007636    0.01871        1        320:
70%|#######    | 28/40 [00:05<00:02,  5.50it/s]
     445/499     0.206G    0.02019   0.007636    0.01871        1        320:
72%|#######2   | 29/40 [00:05<00:01,  5.71it/s]
     445/499     0.206G    0.01997   0.007485    0.01862        1        320:
```

```
72%|#######2  | 29/40 [00:05<00:01,  5.71it/s]
     445/499      0.206G     0.01997    0.007485      0.01862          1        320:
75%|#######5  | 30/40 [00:05<00:01,  5.78it/s]
     445/499      0.206G     0.01968    0.007449       0.0185          1        320:
75%|#######5  | 30/40 [00:05<00:01,  5.78it/s]
     445/499      0.206G     0.01968    0.007449       0.0185          1        320:
78%|#######7  | 31/40 [00:05<00:01,  5.63it/s]
     445/499      0.206G     0.01968    0.007677       0.0187          4        320:
78%|#######7  | 31/40 [00:05<00:01,  5.63it/s]
     445/499      0.206G     0.01968    0.007677       0.0187          4        320:
80%|######## | 32/40 [00:05<00:01,  5.64it/s]
     445/499      0.206G     0.01949     0.00788      0.01864          4        320:
80%|######## | 32/40 [00:05<00:01,  5.64it/s]
     445/499      0.206G     0.01949     0.00788      0.01864          4        320:
82%|########2| 33/40 [00:05<00:01,  5.54it/s]
     445/499      0.206G     0.01933    0.007862      0.01863          2        320:
82%|########2| 33/40 [00:05<00:01,  5.54it/s]
     445/499      0.206G     0.01933    0.007862      0.01863          2        320:
85%|########5| 34/40 [00:05<00:01,  5.77it/s]
     445/499      0.206G     0.01909    0.007731      0.01849          1        320:
85%|########5| 34/40 [00:06<00:01,  5.77it/s]
     445/499      0.206G     0.01909    0.007731      0.01849          1        320:
88%|########7| 35/40 [00:06<00:00,  5.62it/s]
     445/499      0.206G      0.0195    0.007927      0.01864          4        320:
88%|########7| 35/40 [00:06<00:00,  5.62it/s]
     445/499      0.206G      0.0195    0.007927      0.01864          4        320:
90%|#########| 36/40 [00:06<00:00,  5.67it/s]
     445/499      0.206G     0.01957     0.00817       0.0186          4        320:
90%|#########| 36/40 [00:06<00:00,  5.67it/s]
     445/499      0.206G     0.01957     0.00817       0.0186          4        320:
92%|#########2| 37/40 [00:06<00:00,  5.72it/s]
     445/499      0.206G     0.01924    0.008024      0.01841          1        320:
92%|#########2| 37/40 [00:06<00:00,  5.72it/s]
     445/499      0.206G     0.01924    0.008024      0.01841          1        320:
95%|#########5| 38/40 [00:06<00:00,  5.62it/s]
     445/499      0.206G     0.01971    0.007988      0.01837          3        320:
95%|#########5| 38/40 [00:06<00:00,  5.62it/s]
     445/499      0.206G     0.01971    0.007988      0.01837          3        320:
98%|#########7| 39/40 [00:06<00:00,  5.63it/s]
     445/499      0.206G      0.0196    0.007916      0.01838          2        320:
98%|#########7| 39/40 [00:07<00:00,  5.63it/s]
     445/499      0.206G      0.0196    0.007916      0.01838          2        320:
100%|##########| 40/40 [00:07<00:00,  5.84it/s]
     445/499      0.206G      0.0196    0.007916      0.01838          2        320:
100%|##########| 40/40 [00:07<00:00,  5.68it/s]

                Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|             | 0/20 [00:00<?, ?it/s]
```

```
            Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 13.09it/s]
            Class     Images  Instances          P          R      mAP50
mAP50-95:  25%|##5        | 5/20 [00:00<00:00, 16.50it/s]
            Class     Images  Instances          P          R      mAP50
mAP50-95:  35%|###5       | 7/20 [00:00<00:00, 17.16it/s]
            Class     Images  Instances          P          R      mAP50
mAP50-95:  45%|####5      | 9/20 [00:00<00:00, 17.55it/s]
            Class     Images  Instances          P          R      mAP50
mAP50-95:  55%|#####5     | 11/20 [00:00<00:00, 17.79it/s]
            Class     Images  Instances          P          R      mAP50
mAP50-95:  65%|######5    | 13/20 [00:00<00:00, 17.78it/s]
            Class     Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5   | 15/20 [00:00<00:00, 16.47it/s]
            Class     Images  Instances          P          R      mAP50
mAP50-95:  85%|########5  | 17/20 [00:01<00:00, 16.99it/s]
            Class     Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5 | 19/20 [00:01<00:00, 16.65it/s]
            Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.01it/s]
              all       40         40      0.966      0.975      0.992
0.813

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
    446/499     0.206G    0.05408    0.01158    0.01989          3       320:
0%|          | 0/40 [00:00<?, ?it/s]
    446/499     0.206G    0.05408    0.01158    0.01989          3       320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
    446/499     0.206G    0.03389   0.009461    0.01756          2       320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
    446/499     0.206G    0.03389   0.009461    0.01756          2       320:
5%|5         | 2/40 [00:00<00:06,  5.80it/s]
    446/499     0.206G    0.02663   0.008309    0.01751          2       320:
5%|5         | 2/40 [00:00<00:06,  5.80it/s]
    446/499     0.206G    0.02663   0.008309    0.01751          2       320:
8%|7         | 3/40 [00:00<00:06,  5.58it/s]
    446/499     0.206G    0.02373   0.007058    0.01672          1       320:
8%|7         | 3/40 [00:00<00:06,  5.58it/s]
    446/499     0.206G    0.02373   0.007058    0.01672          1       320:
10%|#         | 4/40 [00:00<00:06,  5.48it/s]
    446/499     0.206G    0.02374   0.008661     0.0168          4       320:
10%|#         | 4/40 [00:00<00:06,  5.48it/s]
    446/499     0.206G    0.02374   0.008661     0.0168          4       320:
12%|#2        | 5/40 [00:00<00:06,  5.08it/s]
    446/499     0.206G    0.02208   0.008692    0.01643          2       320:
12%|#2        | 5/40 [00:01<00:06,  5.08it/s]
```

```
   446/499      0.206G    0.02208   0.008692    0.01643        2          320:
15%|#5       | 6/40 [00:01<00:06,  5.03it/s]
   446/499      0.206G    0.02226   0.008544    0.02152        2          320:
15%|#5       | 6/40 [00:01<00:06,  5.03it/s]
   446/499      0.206G    0.02226   0.008544    0.02152        2          320:
18%|#7       | 7/40 [00:01<00:06,  5.12it/s]
   446/499      0.206G    0.02114   0.008422    0.02053        2          320:
18%|#7       | 7/40 [00:01<00:06,  5.12it/s]
   446/499      0.206G    0.02114   0.008422    0.02053        2          320:
20%|##       | 8/40 [00:01<00:06,  5.05it/s]
   446/499      0.206G    0.02053   0.007923     0.0198        1          320:
20%|##       | 8/40 [00:01<00:06,  5.05it/s]
   446/499      0.206G    0.02053   0.007923     0.0198        1          320:
22%|##2      | 9/40 [00:01<00:06,  4.89it/s]
   446/499      0.206G    0.02052   0.008416    0.01977        4          320:
22%|##2      | 9/40 [00:01<00:06,  4.89it/s]
   446/499      0.206G    0.02052   0.008416    0.01977        4          320:
25%|##5      | 10/40 [00:01<00:06,  4.89it/s]
   446/499      0.206G    0.01992   0.007886    0.01951        1          320:
25%|##5      | 10/40 [00:02<00:06,  4.89it/s]
   446/499      0.206G    0.01992   0.007886    0.01951        1          320:
28%|##7      | 11/40 [00:02<00:05,  4.90it/s]
   446/499      0.206G    0.02065   0.007875    0.01964        2          320:
28%|##7      | 11/40 [00:02<00:05,  4.90it/s]
   446/499      0.206G    0.02065   0.007875    0.01964        2          320:
30%|###      | 12/40 [00:02<00:05,  4.83it/s]
   446/499      0.206G    0.02069   0.008359     0.0198        4          320:
30%|###      | 12/40 [00:02<00:05,  4.83it/s]
   446/499      0.206G    0.02069   0.008359     0.0198        4          320:
32%|###2     | 13/40 [00:02<00:05,  4.92it/s]
   446/499      0.206G    0.01979    0.00801    0.01965        1          320:
32%|###2     | 13/40 [00:02<00:05,  4.92it/s]
   446/499      0.206G    0.01979    0.00801    0.01965        1          320:
35%|###5     | 14/40 [00:02<00:05,  4.92it/s]
   446/499      0.206G    0.01923    0.00769    0.01936        1          320:
35%|###5     | 14/40 [00:02<00:05,  4.92it/s]
   446/499      0.206G    0.01923    0.00769    0.01936        1          320:
38%|###7     | 15/40 [00:02<00:05,  4.90it/s]
   446/499      0.206G    0.01842   0.007394    0.01908        1          320:
38%|###7     | 15/40 [00:03<00:05,  4.90it/s]
   446/499      0.206G    0.01842   0.007394    0.01908        1          320:
40%|####     | 16/40 [00:03<00:04,  4.91it/s]
   446/499      0.206G    0.01814   0.007321    0.01898        1          320:
40%|####     | 16/40 [00:03<00:04,  4.91it/s]
   446/499      0.206G    0.01814   0.007321    0.01898        1          320:
42%|####2    | 17/40 [00:03<00:04,  5.15it/s]
   446/499      0.206G    0.02019   0.007411    0.01897        3          320:
42%|####2    | 17/40 [00:03<00:04,  5.15it/s]
```

```
    446/499     0.206G    0.02019    0.007411     0.01897           3           320:
45%|####5      | 18/40 [00:03<00:04,  5.07it/s]
    446/499     0.206G    0.01988    0.007209     0.01875           1           320:
45%|####5      | 18/40 [00:03<00:04,  5.07it/s]
    446/499     0.206G    0.01988    0.007209     0.01875           1           320:
48%|####7      | 19/40 [00:03<00:03,  5.27it/s]
    446/499     0.206G    0.01986    0.007604     0.01866           4           320:
48%|####7      | 19/40 [00:03<00:03,  5.27it/s]
    446/499     0.206G    0.01986    0.007604     0.01866           4           320:
50%|#####      | 20/40 [00:03<00:04,  4.92it/s]
    446/499     0.206G    0.01982     0.0076      0.0188           2           320:
50%|#####      | 20/40 [00:04<00:04,  4.92it/s]
    446/499     0.206G    0.01982     0.0076      0.0188           2           320:
52%|#####2     | 21/40 [00:04<00:03,  5.16it/s]
    446/499     0.206G    0.02033    0.007767     0.0191           4           320:
52%|#####2     | 21/40 [00:04<00:03,  5.16it/s]
    446/499     0.206G    0.02033    0.007767     0.0191           4           320:
55%|#####5     | 22/40 [00:04<00:03,  5.34it/s]
    446/499     0.206G    0.02099    0.007758     0.01896           2           320:
55%|#####5     | 22/40 [00:04<00:03,  5.34it/s]
    446/499     0.206G    0.02099    0.007758     0.01896           2           320:
57%|#####7     | 23/40 [00:04<00:03,  5.31it/s]
    446/499     0.206G    0.02056    0.007714     0.01885           2           320:
57%|#####7     | 23/40 [00:04<00:03,  5.31it/s]
    446/499     0.206G    0.02056    0.007714     0.01885           2           320:
60%|######     | 24/40 [00:04<00:02,  5.59it/s]
    446/499     0.206G    0.02134    0.008095     0.01922           4           320:
60%|######     | 24/40 [00:04<00:02,  5.59it/s]
    446/499     0.206G    0.02134    0.008095     0.01922           4           320:
62%|######2    | 25/40 [00:04<00:02,  5.51it/s]
    446/499     0.206G    0.02118    0.008104     0.01905           1           320:
62%|######2    | 25/40 [00:05<00:02,  5.51it/s]
    446/499     0.206G    0.02118    0.008104     0.01905           1           320:
65%|######5    | 26/40 [00:05<00:02,  5.48it/s]
    446/499     0.206G    0.02095    0.008344     0.01902           4           320:
65%|######5    | 26/40 [00:05<00:02,  5.48it/s]
    446/499     0.206G    0.02095    0.008344     0.01902           4           320:
68%|######7    | 27/40 [00:05<00:02,  5.27it/s]
    446/499     0.206G     0.0209    0.008226     0.01885           1           320:
68%|######7    | 27/40 [00:05<00:02,  5.27it/s]
    446/499     0.206G     0.0209    0.008226     0.01885           1           320:
70%|#######    | 28/40 [00:05<00:02,  5.42it/s]
    446/499     0.206G    0.02121    0.008236     0.01905           2           320:
70%|#######    | 28/40 [00:05<00:02,  5.42it/s]
    446/499     0.206G    0.02121    0.008236     0.01905           2           320:
72%|#######2   | 29/40 [00:05<00:01,  5.52it/s]
    446/499     0.206G    0.02093    0.008158     0.01895           2           320:
72%|#######2   | 29/40 [00:05<00:01,  5.52it/s]
```

```
    446/499      0.206G      0.02093    0.008158      0.01895           2           320:
75%|#######5  | 30/40 [00:05<00:01,  5.46it/s]
    446/499      0.206G      0.02111    0.008454      0.01913           4           320:
75%|#######5  | 30/40 [00:05<00:01,  5.46it/s]
    446/499      0.206G      0.02111    0.008454      0.01913           4           320:
78%|#######7  | 31/40 [00:05<00:01,  5.42it/s]
    446/499      0.206G      0.02078    0.008277      0.01899           1           320:
78%|#######7  | 31/40 [00:06<00:01,  5.42it/s]
    446/499      0.206G      0.02078    0.008277      0.01899           1           320:
80%|######## | 32/40 [00:06<00:01,  5.38it/s]
    446/499      0.206G      0.02045    0.008204      0.01887           1           320:
80%|######## | 32/40 [00:06<00:01,  5.38it/s]
    446/499      0.206G      0.02045    0.008204      0.01887           1           320:
82%|########2 | 33/40 [00:06<00:01,  5.65it/s]
    446/499      0.206G       0.0201    0.00807       0.01889           1           320:
82%|########2 | 33/40 [00:06<00:01,  5.65it/s]
    446/499      0.206G       0.0201    0.00807       0.01889           1           320:
85%|########5 | 34/40 [00:06<00:01,  5.70it/s]
    446/499      0.206G      0.02015    0.008317      0.01887           4           320:
85%|########5 | 34/40 [00:06<00:01,  5.70it/s]
    446/499      0.206G      0.02015    0.008317      0.01887           4           320:
88%|########7 | 35/40 [00:06<00:00,  5.72it/s]
    446/499      0.206G      0.02073    0.008343       0.0188           2           320:
88%|########7 | 35/40 [00:06<00:00,  5.72it/s]
    446/499      0.206G      0.02073    0.008343       0.0188           2           320:
90%|######### | 36/40 [00:06<00:00,  5.46it/s]
    446/499      0.206G      0.02041    0.008232      0.01876           1           320:
90%|######### | 36/40 [00:07<00:00,  5.46it/s]
    446/499      0.206G      0.02041    0.008232      0.01876           1           320:
92%|#########2| 37/40 [00:07<00:00,  5.57it/s]
    446/499      0.206G      0.02088    0.008308      0.01881           3           320:
92%|#########2| 37/40 [00:07<00:00,  5.57it/s]
    446/499      0.206G      0.02088    0.008308      0.01881           3           320:
95%|#########5| 38/40 [00:07<00:00,  5.57it/s]
    446/499      0.206G      0.02097    0.008445      0.01881           4           320:
95%|#########5| 38/40 [00:07<00:00,  5.57it/s]
    446/499      0.206G      0.02097    0.008445      0.01881           4           320:
98%|#########7| 39/40 [00:07<00:00,  5.64it/s]
    446/499      0.206G      0.02131    0.008475      0.01933           2           320:
98%|#########7| 39/40 [00:07<00:00,  5.64it/s]
    446/499      0.206G      0.02131    0.008475      0.01933           2           320:
100%|##########| 40/40 [00:07<00:00,  5.41it/s]
    446/499      0.206G      0.02131    0.008475      0.01933           2           320:
100%|##########| 40/40 [00:07<00:00,  5.28it/s]

              Class      Images  Instances           P           R       mAP50
mAP50-95:    0%|            | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances           P           R       mAP50
```

```
mAP50-95:  10%|#          | 2/20 [00:00<00:00, 18.64it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:01, 14.68it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 16.13it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 16.92it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 15.08it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 16.03it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5   | 15/20 [00:00<00:00, 17.23it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  85%|########5  | 17/20 [00:01<00:00, 16.86it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5 | 19/20 [00:01<00:00, 16.90it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.80it/s]
                  all        40         40      0.961      0.963      0.991
0.809
```

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances	Size

```
  0%|          | 0/40 [00:00<?, ?it/s]
   447/499      0.206G    0.02144    0.01817    0.02769          4        320:
  0%|          | 0/40 [00:00<?, ?it/s]
   447/499      0.206G    0.02144    0.01817    0.02769          4        320:
  2%|2         | 1/40 [00:00<00:06,  5.82it/s]
   447/499      0.206G    0.01545    0.01099    0.02415          1        320:
  2%|2         | 1/40 [00:00<00:06,  5.82it/s]
   447/499      0.206G    0.01545    0.01099    0.02415          1        320:
  5%|5         | 2/40 [00:00<00:06,  6.15it/s]
   447/499      0.206G     0.0103   0.007493     0.0161          0        320:
  5%|5         | 2/40 [00:00<00:06,  6.15it/s]
   447/499      0.206G     0.0103   0.007493     0.0161          0        320:
  8%|7         | 3/40 [00:00<00:05,  6.55it/s]
   447/499      0.206G    0.01315   0.007406    0.01718          2        320:
  8%|7         | 3/40 [00:00<00:05,  6.55it/s]
   447/499      0.206G    0.01315   0.007406    0.01718          2        320:
 10%|#         | 4/40 [00:00<00:05,  6.01it/s]
   447/499      0.206G    0.01557    0.00897    0.01827          4        320:
 10%|#         | 4/40 [00:00<00:05,  6.01it/s]
   447/499      0.206G    0.01557    0.00897    0.01827          4        320:
 12%|#2        | 5/40 [00:00<00:06,  5.72it/s]
   447/499      0.206G     0.0148   0.009445    0.01747          2        320:
 12%|#2        | 5/40 [00:01<00:06,  5.72it/s]
   447/499      0.206G     0.0148   0.009445    0.01747          2        320:
```

126

```
 15%|#5         | 6/40 [00:01<00:05,  5.75it/s]
    447/499    0.206G    0.01548    0.009754    0.01752         4         320:
 15%|#5         | 6/40 [00:01<00:05,  5.75it/s]
    447/499    0.206G    0.01548    0.009754    0.01752         4         320:
 18%|#7         | 7/40 [00:01<00:05,  5.59it/s]
    447/499    0.206G    0.01355    0.008761    0.01533         0         320:
 18%|#7         | 7/40 [00:01<00:05,  5.59it/s]
    447/499    0.206G    0.01355    0.008761    0.01533         0         320:
 20%|##         | 8/40 [00:01<00:05,  6.00it/s]
    447/499    0.206G    0.01295    0.008148    0.01642         1         320:
 20%|##         | 8/40 [00:01<00:05,  6.00it/s]
    447/499    0.206G    0.01295    0.008148    0.01642         1         320:
 22%|##2        | 9/40 [00:01<00:05,  5.94it/s]
    447/499    0.206G    0.01308    0.007712    0.01609         1         320:
 22%|##2        | 9/40 [00:01<00:05,  5.94it/s]
    447/499    0.206G    0.01308    0.007712    0.01609         1         320:
 25%|##5        | 10/40 [00:01<00:05,  5.72it/s]
    447/499    0.206G    0.01277    0.007562    0.01597         2         320:
 25%|##5        | 10/40 [00:01<00:05,  5.72it/s]
    447/499    0.206G    0.01277    0.007562    0.01597         2         320:
 28%|##7        | 11/40 [00:01<00:05,  5.74it/s]
    447/499    0.206G    0.01264    0.00729     0.01624         1         320:
 28%|##7        | 11/40 [00:02<00:05,  5.74it/s]
    447/499    0.206G    0.01264    0.00729     0.01624         1         320:
 30%|###        | 12/40 [00:02<00:04,  5.76it/s]
    447/499    0.206G    0.01287    0.008066    0.01695         4         320:
 30%|###        | 12/40 [00:02<00:04,  5.76it/s]
    447/499    0.206G    0.01287    0.008066    0.01695         4         320:
 32%|###2       | 13/40 [00:02<00:04,  5.78it/s]
    447/499    0.206G    0.01531    0.007934    0.01697         2         320:
 32%|###2       | 13/40 [00:02<00:04,  5.78it/s]
    447/499    0.206G    0.01531    0.007934    0.01697         2         320:
 35%|###5       | 14/40 [00:02<00:04,  5.63it/s]
    447/499    0.206G    0.01596    0.008215    0.01735         3         320:
 35%|###5       | 14/40 [00:02<00:04,  5.63it/s]
    447/499    0.206G    0.01596    0.008215    0.01735         3         320:
 38%|###7       | 15/40 [00:02<00:04,  5.68it/s]
    447/499    0.206G    0.01704    0.008572    0.01826         4         320:
 38%|###7       | 15/40 [00:02<00:04,  5.68it/s]
    447/499    0.206G    0.01704    0.008572    0.01826         4         320:
 40%|####       | 16/40 [00:02<00:04,  5.56it/s]
    447/499    0.206G    0.01676    0.008455    0.01831         2         320:
 40%|####       | 16/40 [00:02<00:04,  5.56it/s]
    447/499    0.206G    0.01676    0.008455    0.01831         2         320:
 42%|####2      | 17/40 [00:02<00:04,  5.65it/s]
    447/499    0.206G    0.01622    0.008304    0.0182          1         320:
 42%|####2      | 17/40 [00:03<00:04,  5.65it/s]
    447/499    0.206G    0.01622    0.008304    0.0182          1         320:
```

```
45%|####5       | 18/40 [00:03<00:03,  5.69it/s]
     447/499      0.206G      0.0162    0.008146     0.01802           1         320:
45%|####5       | 18/40 [00:03<00:03,  5.69it/s]
     447/499      0.206G      0.0162    0.008146     0.01802           1         320:
48%|####7       | 19/40 [00:03<00:03,  5.71it/s]
     447/499      0.206G      0.01604   0.008005     0.01807           1         320:
48%|####7       | 19/40 [00:03<00:03,  5.71it/s]
     447/499      0.206G      0.01604   0.008005     0.01807           1         320:
50%|#####       | 20/40 [00:03<00:03,  5.74it/s]
     447/499      0.206G      0.0157    0.007932     0.01793           2         320:
50%|#####       | 20/40 [00:03<00:03,  5.74it/s]
     447/499      0.206G      0.0157    0.007932     0.01793           2         320:
52%|#####2      | 21/40 [00:03<00:03,  5.76it/s]
     447/499      0.206G      0.01587   0.008156     0.01845           4         320:
52%|#####2      | 21/40 [00:03<00:03,  5.76it/s]
     447/499      0.206G      0.01587   0.008156     0.01845           4         320:
55%|#####5      | 22/40 [00:03<00:03,  5.61it/s]
     447/499      0.206G      0.01621   0.008161     0.01883           2         320:
55%|#####5      | 22/40 [00:03<00:03,  5.61it/s]
     447/499      0.206G      0.01621   0.008161     0.01883           2         320:
57%|#####7      | 23/40 [00:03<00:02,  5.67it/s]
     447/499      0.206G      0.01643   0.008476     0.01914           4         320:
57%|#####7      | 23/40 [00:04<00:02,  5.67it/s]
     447/499      0.206G      0.01643   0.008476     0.01914           4         320:
60%|######      | 24/40 [00:04<00:02,  5.42it/s]
     447/499      0.206G      0.01671   0.008796     0.01902           4         320:
60%|######      | 24/40 [00:04<00:02,  5.42it/s]
     447/499      0.206G      0.01671   0.008796     0.01902           4         320:
62%|######2     | 25/40 [00:04<00:02,  5.41it/s]
     447/499      0.206G      0.01645   0.008623      0.0189           1         320:
62%|######2     | 25/40 [00:04<00:02,  5.41it/s]
     447/499      0.206G      0.01645   0.008623      0.0189           1         320:
65%|######5     | 26/40 [00:04<00:02,  5.64it/s]
     447/499      0.206G      0.01702   0.008836     0.01888           4         320:
65%|######5     | 26/40 [00:04<00:02,  5.64it/s]
     447/499      0.206G      0.01702   0.008836     0.01888           4         320:
68%|######7     | 27/40 [00:04<00:02,  5.54it/s]
     447/499      0.206G      0.01709   0.008804     0.01871           2         320:
68%|######7     | 27/40 [00:04<00:02,  5.54it/s]
     447/499      0.206G      0.01709   0.008804     0.01871           2         320:
70%|#######     | 28/40 [00:04<00:02,  5.32it/s]
     447/499      0.206G      0.01687   0.008731      0.0189           2         320:
70%|#######     | 28/40 [00:05<00:02,  5.32it/s]
     447/499      0.206G      0.01687   0.008731      0.0189           2         320:
72%|#######2    | 29/40 [00:05<00:02,  5.46it/s]
     447/499      0.206G      0.01697   0.008529     0.01861           1         320:
72%|#######2    | 29/40 [00:05<00:02,  5.46it/s]
     447/499      0.206G      0.01697   0.008529     0.01861           1         320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.71it/s]
      447/499     0.206G    0.01717    0.008807    0.01862         4         320:
75%|#######5  | 30/40 [00:05<00:01,  5.71it/s]
      447/499     0.206G    0.01717    0.008807    0.01862         4         320:
78%|#######7  | 31/40 [00:05<00:01,  5.67it/s]
      447/499     0.206G    0.01825    0.008816    0.01856         2         320:
78%|#######7  | 31/40 [00:05<00:01,  5.67it/s]
      447/499     0.206G    0.01825    0.008816    0.01856         2         320:
80%|########  | 32/40 [00:05<00:01,  5.35it/s]
      447/499     0.206G    0.01798    0.008653    0.01843         1         320:
80%|########  | 32/40 [00:05<00:01,  5.35it/s]
      447/499     0.206G    0.01798    0.008653    0.01843         1         320:
82%|########2 | 33/40 [00:05<00:01,  5.63it/s]
      447/499     0.206G    0.01766    0.008474    0.01841         1         320:
82%|########2 | 33/40 [00:05<00:01,  5.63it/s]
      447/499     0.206G    0.01766    0.008474    0.01841         1         320:
85%|########5 | 34/40 [00:05<00:01,  5.65it/s]
      447/499     0.206G    0.01764    0.008602     0.0184         4         320:
85%|########5 | 34/40 [00:06<00:01,  5.65it/s]
      447/499     0.206G    0.01764    0.008602     0.0184         4         320:
88%|########7 | 35/40 [00:06<00:00,  5.41it/s]
      447/499     0.206G     0.0174    0.008443     0.0182         1         320:
88%|########7 | 35/40 [00:06<00:00,  5.41it/s]
      447/499     0.206G     0.0174    0.008443     0.0182         1         320:
90%|######### | 36/40 [00:06<00:00,  5.39it/s]
      447/499     0.206G     0.0184    0.008473    0.01819         3         320:
90%|######### | 36/40 [00:06<00:00,  5.39it/s]
      447/499     0.206G     0.0184    0.008473    0.01819         3         320:
92%|#########2| 37/40 [00:06<00:00,  5.36it/s]
      447/499     0.206G    0.01814    0.008324    0.01807         1         320:
92%|#########2| 37/40 [00:06<00:00,  5.36it/s]
      447/499     0.206G    0.01814    0.008324    0.01807         1         320:
95%|#########5| 38/40 [00:06<00:00,  5.49it/s]
      447/499     0.206G    0.01875    0.008636    0.01829         4         320:
95%|#########5| 38/40 [00:06<00:00,  5.49it/s]
      447/499     0.206G    0.01875    0.008636    0.01829         4         320:
98%|#########7| 39/40 [00:06<00:00,  5.31it/s]
      447/499     0.206G    0.01855    0.008555    0.01822         2         320:
98%|#########7| 39/40 [00:07<00:00,  5.31it/s]
      447/499     0.206G    0.01855    0.008555    0.01822         2         320:
100%|##########| 40/40 [00:07<00:00,  5.30it/s]
      447/499     0.206G    0.01855    0.008555    0.01822         2         320:
100%|##########| 40/40 [00:07<00:00,  5.61it/s]

              Class     Images  Instances          P          R      mAP50
mAP50-95:    0%|              | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   10%|#            | 2/20 [00:00<00:00, 18.20it/s]
```

```
             Class      Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:01, 15.63it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 15.79it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 15.80it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 15.87it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 15.91it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 15.94it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:01<00:00, 15.94it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.96it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.97it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.97it/s]
               all         40         40      0.961      0.963      0.991
0.809

      Epoch    GPU_mem    box_loss   obj_loss   cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
     448/499     0.206G   0.009403    0.01078    0.01328          2        320:
0%|            | 0/40 [00:00<?, ?it/s]
     448/499     0.206G   0.009403    0.01078    0.01328          2        320:
2%|2          | 1/40 [00:00<00:07,  4.92it/s]
     448/499     0.206G    0.01902    0.01299    0.01954          4        320:
2%|2          | 1/40 [00:00<00:07,  4.92it/s]
     448/499     0.206G    0.01902    0.01299    0.01954          4        320:
5%|5          | 2/40 [00:00<00:08,  4.69it/s]
     448/499     0.206G    0.01721    0.01097    0.01999          2        320:
5%|5          | 2/40 [00:00<00:08,  4.69it/s]
     448/499     0.206G    0.01721    0.01097    0.01999          2        320:
8%|7          | 3/40 [00:00<00:07,  4.79it/s]
     448/499     0.206G    0.01732    0.01002    0.01963          1        320:
8%|7          | 3/40 [00:00<00:07,  4.79it/s]
     448/499     0.206G    0.01732    0.01002    0.01963          1        320:
10%|#          | 4/40 [00:00<00:08,  4.43it/s]
     448/499     0.206G    0.01615   0.009496     0.0184          2        320:
10%|#          | 4/40 [00:01<00:08,  4.43it/s]
     448/499     0.206G    0.01615   0.009496     0.0184          2        320:
12%|#2         | 5/40 [00:01<00:07,  4.71it/s]
     448/499     0.206G    0.01642    0.01056    0.01834          4        320:
12%|#2         | 5/40 [00:01<00:07,  4.71it/s]
```

```
    448/499     0.206G     0.01642     0.01056     0.01834          4        320:
15%|#5         | 6/40 [00:01<00:07,  4.66it/s]
    448/499     0.206G     0.01773     0.01086     0.01968          4        320:
15%|#5         | 6/40 [00:01<00:07,  4.66it/s]
    448/499     0.206G     0.01773     0.01086     0.01968          4        320:
18%|#7         | 7/40 [00:01<00:06,  4.85it/s]
    448/499     0.206G     0.01889     0.01138     0.02081          4        320:
18%|#7         | 7/40 [00:01<00:06,  4.85it/s]
    448/499     0.206G     0.01889     0.01138     0.02081          4        320:
20%|##         | 8/40 [00:01<00:06,  5.00it/s]
    448/499     0.206G     0.01965     0.01146     0.02094          3        320:
20%|##         | 8/40 [00:01<00:06,  5.00it/s]
    448/499     0.206G     0.01965     0.01146     0.02094          3        320:
22%|##2        | 9/40 [00:01<00:05,  5.23it/s]
    448/499     0.206G     0.01892     0.01087     0.02105          1        320:
22%|##2        | 9/40 [00:02<00:05,  5.23it/s]
    448/499     0.206G     0.01892     0.01087     0.02105          1        320:
25%|##5        | 10/40 [00:02<00:05,  5.39it/s]
    448/499     0.206G       0.019     0.01063      0.0211          2        320:
25%|##5        | 10/40 [00:02<00:05,  5.39it/s]
    448/499     0.206G       0.019     0.01063      0.0211          2        320:
28%|##7        | 11/40 [00:02<00:05,  5.24it/s]
    448/499     0.206G      0.0194     0.01058     0.02107          4        320:
28%|##7        | 11/40 [00:02<00:05,  5.24it/s]
    448/499     0.206G      0.0194     0.01058     0.02107          4        320:
30%|###        | 12/40 [00:02<00:05,  5.40it/s]
    448/499     0.206G     0.01988     0.01092     0.02105          4        320:
30%|###        | 12/40 [00:02<00:05,  5.40it/s]
    448/499     0.206G     0.01988     0.01092     0.02105          4        320:
32%|###2       | 13/40 [00:02<00:05,  5.36it/s]
    448/499     0.206G     0.01916     0.01062     0.02048          2        320:
32%|###2       | 13/40 [00:02<00:05,  5.36it/s]
    448/499     0.206G     0.01916     0.01062     0.02048          2        320:
35%|###5       | 14/40 [00:02<00:04,  5.49it/s]
    448/499     0.206G     0.01909     0.01019     0.02022          1        320:
35%|###5       | 14/40 [00:02<00:04,  5.49it/s]
    448/499     0.206G     0.01909     0.01019     0.02022          1        320:
38%|###7       | 15/40 [00:02<00:04,  5.58it/s]
    448/499     0.206G     0.02123     0.01015     0.02161          2        320:
38%|###7       | 15/40 [00:03<00:04,  5.58it/s]
    448/499     0.206G     0.02123     0.01015     0.02161          2        320:
40%|####       | 16/40 [00:03<00:04,  5.35it/s]
    448/499     0.206G     0.02173     0.01067     0.02197          4        320:
40%|####       | 16/40 [00:03<00:04,  5.35it/s]
    448/499     0.206G     0.02173     0.01067     0.02197          4        320:
42%|####2      | 17/40 [00:03<00:04,  5.09it/s]
    448/499     0.206G     0.02101     0.01024      0.0215          1        320:
42%|####2      | 17/40 [00:03<00:04,  5.09it/s]
```

```
     448/499      0.206G      0.02101      0.01024       0.0215            1           320:
45%|####5     | 18/40 [00:03<00:04,  5.19it/s]
     448/499      0.206G      0.02205      0.01008      0.02143            2           320:
45%|####5     | 18/40 [00:03<00:04,  5.19it/s]
     448/499      0.206G      0.02205      0.01008      0.02143            2           320:
48%|####7     | 19/40 [00:03<00:03,  5.31it/s]
     448/499      0.206G      0.02147     0.009955      0.02105            1           320:
48%|####7     | 19/40 [00:03<00:03,  5.31it/s]
     448/499      0.206G      0.02147     0.009955      0.02105            1           320:
50%|#####     | 20/40 [00:03<00:03,  5.32it/s]
     448/499      0.206G      0.02161      0.01034      0.02124            4           320:
50%|#####     | 20/40 [00:04<00:03,  5.32it/s]
     448/499      0.206G      0.02161      0.01034      0.02124            4           320:
52%|#####2    | 21/40 [00:04<00:03,  5.17it/s]
     448/499      0.206G      0.02163      0.01055      0.02122            4           320:
52%|#####2    | 21/40 [00:04<00:03,  5.17it/s]
     448/499      0.206G      0.02163      0.01055      0.02122            4           320:
55%|#####5    | 22/40 [00:04<00:03,  5.35it/s]
     448/499      0.206G      0.02248      0.01046      0.02138            2           320:
55%|#####5    | 22/40 [00:04<00:03,  5.35it/s]
     448/499      0.206G      0.02248      0.01046      0.02138            2           320:
57%|#####7    | 23/40 [00:04<00:03,  5.34it/s]
     448/499      0.206G      0.02183      0.01015      0.02097            1           320:
57%|#####7    | 23/40 [00:04<00:03,  5.34it/s]
     448/499      0.206G      0.02183      0.01015      0.02097            1           320:
60%|######    | 24/40 [00:04<00:02,  5.48it/s]
     448/499      0.206G       0.0213     0.009908      0.02059            1           320:
60%|######    | 24/40 [00:04<00:02,  5.48it/s]
     448/499      0.206G       0.0213     0.009908      0.02059            1           320:
62%|######2   | 25/40 [00:04<00:02,  5.58it/s]
     448/499      0.206G      0.02071     0.009688      0.02034            1           320:
62%|######2   | 25/40 [00:05<00:02,  5.58it/s]
     448/499      0.206G      0.02071     0.009688      0.02034            1           320:
65%|######5   | 26/40 [00:05<00:02,  5.36it/s]
     448/499      0.206G      0.02034     0.009546      0.02012            2           320:
65%|######5   | 26/40 [00:05<00:02,  5.36it/s]
     448/499      0.206G      0.02034     0.009546      0.02012            2           320:
68%|######7   | 27/40 [00:05<00:02,  5.47it/s]
     448/499      0.206G      0.01994      0.00935      0.02008            1           320:
68%|######7   | 27/40 [00:05<00:02,  5.47it/s]
     448/499      0.206G      0.01994      0.00935      0.02008            1           320:
70%|#######   | 28/40 [00:05<00:02,  5.57it/s]
     448/499      0.206G      0.01952     0.009261       0.0199            2           320:
70%|#######   | 28/40 [00:05<00:02,  5.57it/s]
     448/499      0.206G      0.01952     0.009261       0.0199            2           320:
72%|#######2  | 29/40 [00:05<00:02,  5.50it/s]
     448/499      0.206G      0.01922     0.009091      0.01973            1           320:
72%|#######2  | 29/40 [00:05<00:02,  5.50it/s]
```

```
    448/499      0.206G     0.01922    0.009091     0.01973          1        320:
75%|#######5  | 30/40 [00:05<00:01,  5.57it/s]
    448/499      0.206G     0.02033    0.008966     0.02058          2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.57it/s]
    448/499      0.206G     0.02033    0.008966     0.02058          2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.50it/s]
    448/499      0.206G     0.02027    0.009143     0.02062          4        320:
78%|#######7  | 31/40 [00:06<00:01,  5.50it/s]
    448/499      0.206G     0.02027    0.009143     0.02062          4        320:
80%|########  | 32/40 [00:06<00:01,  5.44it/s]
    448/499      0.206G     0.01988    0.009053     0.02049          2        320:
80%|########  | 32/40 [00:06<00:01,  5.44it/s]
    448/499      0.206G     0.01988    0.009053     0.02049          2        320:
82%|########2 | 33/40 [00:06<00:01,  5.68it/s]
    448/499      0.206G      0.0203    0.009246     0.02052          4        320:
82%|########2 | 33/40 [00:06<00:01,  5.68it/s]
    448/499      0.206G      0.0203    0.009246     0.02052          4        320:
85%|########5 | 34/40 [00:06<00:01,  5.57it/s]
    448/499      0.206G     0.02094    0.009153     0.02039          2        320:
85%|########5 | 34/40 [00:06<00:01,  5.57it/s]
    448/499      0.206G     0.02094    0.009153     0.02039          2        320:
88%|########7 | 35/40 [00:06<00:00,  5.36it/s]
    448/499      0.206G     0.02136    0.009309     0.02048          3        320:
88%|########7 | 35/40 [00:06<00:00,  5.36it/s]
    448/499      0.206G     0.02136    0.009309     0.02048          3        320:
90%|######### | 36/40 [00:06<00:00,  5.47it/s]
    448/499      0.206G     0.02126    0.009129     0.02024          1        320:
90%|######### | 36/40 [00:06<00:00,  5.47it/s]
    448/499      0.206G     0.02126    0.009129     0.02024          1        320:
92%|#########2| 37/40 [00:06<00:00,  5.72it/s]
    448/499      0.206G     0.02131    0.009114     0.02031          3        320:
92%|#########2| 37/40 [00:07<00:00,  5.72it/s]
    448/499      0.206G     0.02131    0.009114     0.02031          3        320:
95%|#########5| 38/40 [00:07<00:00,  5.60it/s]
    448/499      0.206G     0.02179    0.009136     0.02023          2        320:
95%|#########5| 38/40 [00:07<00:00,  5.60it/s]
    448/499      0.206G     0.02179    0.009136     0.02023          2        320:
98%|#########7| 39/40 [00:07<00:00,  5.67it/s]
    448/499      0.206G     0.02159    0.009027     0.02006          1        320:
98%|#########7| 39/40 [00:07<00:00,  5.67it/s]
    448/499      0.206G     0.02159    0.009027     0.02006          1        320:
100%|##########| 40/40 [00:07<00:00,  5.71it/s]
    448/499      0.206G     0.02159    0.009027     0.02006          1        320:
100%|##########| 40/40 [00:07<00:00,  5.34it/s]

               Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|          | 0/20 [00:00<?, ?it/s]
               Class     Images  Instances          P          R      mAP50
```

133

```
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 15.98it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 16.17it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95:  35%|###5       | 7/20 [00:00<00:00, 17.43it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95:  45%|####5      | 9/20 [00:00<00:00, 17.72it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95:  55%|#####5     | 11/20 [00:00<00:00, 17.90it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95:  65%|######5    | 13/20 [00:00<00:00, 17.91it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95:  75%|#######5   | 15/20 [00:00<00:00, 18.09it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95:  85%|########5 | 17/20 [00:00<00:00, 18.13it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 18.53it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.95it/s]
               all        40         40      0.961      0.952      0.991
0.817

       Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
     449/499     0.206G   0.009266   0.006802    0.01532          1       320:
0%|          | 0/40 [00:00<?, ?it/s]
     449/499     0.206G   0.009266   0.006802    0.01532          1       320:
2%|2         | 1/40 [00:00<00:06,  6.42it/s]
     449/499     0.206G    0.02526    0.01048    0.01646          4       320:
2%|2         | 1/40 [00:00<00:06,  6.42it/s]
     449/499     0.206G    0.02526    0.01048    0.01646          4       320:
5%|5         | 2/40 [00:00<00:06,  6.01it/s]
     449/499     0.206G    0.02095   0.008191    0.01559          1       320:
5%|5         | 2/40 [00:00<00:06,  6.01it/s]
     449/499     0.206G    0.02095   0.008191    0.01559          1       320:
8%|7         | 3/40 [00:00<00:05,  6.18it/s]
     449/499     0.206G    0.01859   0.007143    0.01443          1       320:
8%|7         | 3/40 [00:00<00:05,  6.18it/s]
     449/499     0.206G    0.01859   0.007143    0.01443          1       320:
10%|#         | 4/40 [00:00<00:06,  5.82it/s]
     449/499     0.206G    0.01764   0.007443    0.01471          2       320:
10%|#         | 4/40 [00:00<00:06,  5.82it/s]
     449/499     0.206G    0.01764   0.007443    0.01471          2       320:
12%|#2        | 5/40 [00:00<00:06,  5.82it/s]
     449/499     0.206G    0.01846    0.00817    0.01597          4       320:
12%|#2        | 5/40 [00:01<00:06,  5.82it/s]
     449/499     0.206G    0.01846    0.00817    0.01597          4       320:
```

```
15%|#5         | 6/40 [00:01<00:05,  5.82it/s]
    449/499     0.206G     0.01583     0.007115     0.01369         0         320:
15%|#5         | 6/40 [00:01<00:05,  5.82it/s]
    449/499     0.206G     0.01583     0.007115     0.01369         0         320:
18%|#7         | 7/40 [00:01<00:05,  5.99it/s]
    449/499     0.206G     0.01539     0.007218     0.01374         1         320:
18%|#7         | 7/40 [00:01<00:05,  5.99it/s]
    449/499     0.206G     0.01539     0.007218     0.01374         1         320:
20%|##         | 8/40 [00:01<00:05,  5.91it/s]
    449/499     0.206G     0.01506     0.007369      0.0147         2         320:
20%|##         | 8/40 [00:01<00:05,  5.91it/s]
    449/499     0.206G     0.01506     0.007369      0.0147         2         320:
22%|##2        | 9/40 [00:01<00:05,  6.05it/s]
    449/499     0.206G     0.01439     0.006879     0.01459         1         320:
22%|##2        | 9/40 [00:01<00:05,  6.05it/s]
    449/499     0.206G     0.01439     0.006879     0.01459         1         320:
25%|##5        | 10/40 [00:01<00:05,  5.98it/s]
    449/499     0.206G      0.0175     0.006904     0.01478         2         320:
25%|##5        | 10/40 [00:01<00:05,  5.98it/s]
    449/499     0.206G      0.0175     0.006904     0.01478         2         320:
28%|##7        | 11/40 [00:01<00:04,  5.91it/s]
    449/499     0.206G      0.0195     0.007776     0.01495         3         320:
28%|##7        | 11/40 [00:02<00:04,  5.91it/s]
    449/499     0.206G      0.0195     0.007776     0.01495         3         320:
30%|###        | 12/40 [00:02<00:04,  5.72it/s]
    449/499     0.206G     0.02082     0.007609      0.0162         2         320:
30%|###        | 12/40 [00:02<00:04,  5.72it/s]
    449/499     0.206G     0.02082     0.007609      0.0162         2         320:
32%|###2       | 13/40 [00:02<00:04,  5.75it/s]
    449/499     0.206G     0.02029     0.007318     0.01612         1         320:
32%|###2       | 13/40 [00:02<00:04,  5.75it/s]
    449/499     0.206G     0.02029     0.007318     0.01612         1         320:
35%|###5       | 14/40 [00:02<00:04,  5.75it/s]
    449/499     0.206G      0.0214     0.007367     0.01609         3         320:
35%|###5       | 14/40 [00:02<00:04,  5.75it/s]
    449/499     0.206G      0.0214     0.007367     0.01609         3         320:
38%|###7       | 15/40 [00:02<00:04,  5.61it/s]
    449/499     0.206G     0.02057     0.007116     0.01614         1         320:
38%|###7       | 15/40 [00:02<00:04,  5.61it/s]
    449/499     0.206G     0.02057     0.007116     0.01614         1         320:
40%|####       | 16/40 [00:02<00:04,  5.83it/s]
    449/499     0.206G     0.02008     0.006887     0.01607         1         320:
40%|####       | 16/40 [00:02<00:04,  5.83it/s]
    449/499     0.206G     0.02008     0.006887     0.01607         1         320:
42%|####2      | 17/40 [00:02<00:03,  5.81it/s]
    449/499     0.206G     0.01935     0.006652     0.01597         1         320:
42%|####2      | 17/40 [00:03<00:03,  5.81it/s]
    449/499     0.206G     0.01935     0.006652     0.01597         1         320:
```

```
45%|####5      | 18/40 [00:03<00:03,  5.81it/s]
    449/499      0.206G      0.02024    0.007133    0.01647         4        320:
45%|####5      | 18/40 [00:03<00:03,  5.81it/s]
    449/499      0.206G      0.02024    0.007133    0.01647         4        320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
    449/499      0.206G      0.02162    0.007307    0.01654         3        320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
    449/499      0.206G      0.02162    0.007307    0.01654         3        320:
50%|#####      | 20/40 [00:03<00:03,  5.45it/s]
    449/499      0.206G      0.02117    0.00712     0.01643         1        320:
50%|#####      | 20/40 [00:03<00:03,  5.45it/s]
    449/499      0.206G      0.02117    0.00712     0.01643         1        320:
52%|#####2     | 21/40 [00:03<00:03,  5.71it/s]
    449/499      0.206G      0.021      0.007538    0.01646         4        320:
52%|#####2     | 21/40 [00:03<00:03,  5.71it/s]
    449/499      0.206G      0.021      0.007538    0.01646         4        320:
55%|#####5     | 22/40 [00:03<00:03,  5.45it/s]
    449/499      0.206G      0.02072    0.007434    0.0165          2        320:
55%|#####5     | 22/40 [00:04<00:03,  5.45it/s]
    449/499      0.206G      0.02072    0.007434    0.0165          2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.26it/s]
    449/499      0.206G      0.021      0.007425    0.01655         2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.26it/s]
    449/499      0.206G      0.021      0.007425    0.01655         2        320:
60%|######     | 24/40 [00:04<00:03,  5.15it/s]
    449/499      0.206G      0.02075    0.00768     0.01669         4        320:
60%|######     | 24/40 [00:04<00:03,  5.15it/s]
    449/499      0.206G      0.02075    0.00768     0.01669         4        320:
62%|######2    | 25/40 [00:04<00:02,  5.17it/s]
    449/499      0.206G      0.02113    0.007822    0.01686         2        320:
62%|######2    | 25/40 [00:04<00:02,  5.17it/s]
    449/499      0.206G      0.02113    0.007822    0.01686         2        320:
65%|######5    | 26/40 [00:04<00:02,  5.24it/s]
    449/499      0.206G      0.02112    0.008015    0.01687         4        320:
65%|######5    | 26/40 [00:04<00:02,  5.24it/s]
    449/499      0.206G      0.02112    0.008015    0.01687         4        320:
68%|######7    | 27/40 [00:04<00:02,  5.27it/s]
    449/499      0.206G      0.02085    0.008068    0.01675         2        320:
68%|######7    | 27/40 [00:05<00:02,  5.27it/s]
    449/499      0.206G      0.02085    0.008068    0.01675         2        320:
70%|#######    | 28/40 [00:05<00:02,  5.14it/s]
    449/499      0.206G      0.02097    0.008202    0.0168          4        320:
70%|#######    | 28/40 [00:05<00:02,  5.14it/s]
    449/499      0.206G      0.02097    0.008202    0.0168          4        320:
72%|#######2   | 29/40 [00:05<00:02,  5.20it/s]
    449/499      0.206G      0.02056    0.00802     0.01668         1        320:
72%|#######2   | 29/40 [00:05<00:02,  5.20it/s]
    449/499      0.206G      0.02056    0.00802     0.01668         1        320:
```

```
75%|#######5   | 30/40 [00:05<00:01,  5.51it/s]
     449/499      0.206G     0.02103    0.008184    0.01681           4        320:
75%|#######5   | 30/40 [00:05<00:01,  5.51it/s]
     449/499      0.206G     0.02103    0.008184    0.01681           4        320:
78%|#######7   | 31/40 [00:05<00:01,  5.43it/s]
     449/499      0.206G     0.02103    0.008461    0.01709           4        320:
78%|#######7   | 31/40 [00:05<00:01,  5.43it/s]
     449/499      0.206G     0.02103    0.008461    0.01709           4        320:
80%|########   | 32/40 [00:05<00:01,  5.14it/s]
     449/499      0.206G     0.02071    0.008322    0.01696           1        320:
80%|########   | 32/40 [00:05<00:01,  5.14it/s]
     449/499      0.206G     0.02071    0.008322    0.01696           1        320:
82%|########2  | 33/40 [00:05<00:01,  5.20it/s]
     449/499      0.206G     0.02077    0.008545    0.01709           4        320:
82%|########2  | 33/40 [00:06<00:01,  5.20it/s]
     449/499      0.206G     0.02077    0.008545    0.01709           4        320:
85%|########5  | 34/40 [00:06<00:01,  4.99it/s]
     449/499      0.206G     0.02123    0.008529     0.0171           2        320:
85%|########5  | 34/40 [00:06<00:01,  4.99it/s]
     449/499      0.206G     0.02123    0.008529     0.0171           2        320:
88%|########7  | 35/40 [00:06<00:01,  4.86it/s]
     449/499      0.206G     0.02109    0.008418    0.01706           1        320:
88%|########7  | 35/40 [00:06<00:01,  4.86it/s]
     449/499      0.206G     0.02109    0.008418    0.01706           1        320:
90%|######### | 36/40 [00:06<00:00,  4.99it/s]
     449/499      0.206G     0.02094    0.008581    0.01736           4        320:
90%|######### | 36/40 [00:06<00:00,  4.99it/s]
     449/499      0.206G     0.02094    0.008581    0.01736           4        320:
92%|#########2| 37/40 [00:06<00:00,  4.95it/s]
     449/499      0.206G     0.02101    0.008519    0.01773           2        320:
92%|#########2| 37/40 [00:06<00:00,  4.95it/s]
     449/499      0.206G     0.02101    0.008519    0.01773           2        320:
95%|#########5| 38/40 [00:06<00:00,  4.94it/s]
     449/499      0.206G     0.02068     0.00845    0.01764           2        320:
95%|#########5| 38/40 [00:07<00:00,  4.94it/s]
     449/499      0.206G     0.02068     0.00845    0.01764           2        320:
98%|#########7| 39/40 [00:07<00:00,  4.92it/s]
     449/499      0.206G     0.02083    0.008695     0.0177           4        320:
98%|#########7| 39/40 [00:07<00:00,  4.92it/s]
     449/499      0.206G     0.02083    0.008695     0.0177           4        320:
100%|##########| 40/40 [00:07<00:00,  4.70it/s]
     449/499      0.206G     0.02083    0.008695     0.0177           4        320:
100%|##########| 40/40 [00:07<00:00,  5.39it/s]


             Class     Images  Instances          P          R       mAP50
mAP50-95:    0%|               | 0/20 [00:00<?, ?it/s]
             Class     Images  Instances          P          R       mAP50
mAP50-95:   10%|#             | 2/20 [00:00<00:01, 14.22it/s]
```

```
              Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:01, 15.08it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:01, 13.95it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 14.68it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 15.13it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 15.38it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 14.98it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:01<00:00, 15.89it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 14.72it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.20it/s]
                all         40         40      0.964      0.969      0.992
0.811

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    450/499     0.206G    0.02121    0.01326    0.01868          4       320:
0%|           | 0/40 [00:00<?, ?it/s]
    450/499     0.206G    0.02121    0.01326    0.01868          4       320:
2%|2          | 1/40 [00:00<00:06,  5.74it/s]
    450/499     0.206G    0.01581   0.008618     0.0168          1       320:
2%|2          | 1/40 [00:00<00:06,  5.74it/s]
    450/499     0.206G    0.01581   0.008618     0.0168          1       320:
5%|5          | 2/40 [00:00<00:06,  5.78it/s]
    450/499     0.206G    0.01648     0.0116    0.01842          4       320:
5%|5          | 2/40 [00:00<00:06,  5.78it/s]
    450/499     0.206G    0.01648     0.0116    0.01842          4       320:
8%|7          | 3/40 [00:00<00:06,  5.79it/s]
    450/499     0.206G    0.01398    0.01015    0.01669          1       320:
8%|7          | 3/40 [00:00<00:06,  5.79it/s]
    450/499     0.206G    0.01398    0.01015    0.01669          1       320:
10%|#          | 4/40 [00:00<00:06,  5.84it/s]
    450/499     0.206G    0.01367   0.009646    0.01669          2       320:
10%|#          | 4/40 [00:00<00:06,  5.84it/s]
    450/499     0.206G    0.01367   0.009646    0.01669          2       320:
12%|#2         | 5/40 [00:00<00:05,  5.97it/s]
    450/499     0.206G    0.01463   0.009762     0.0165          2       320:
12%|#2         | 5/40 [00:01<00:05,  5.97it/s]
    450/499     0.206G    0.01463   0.009762     0.0165          2       320:
15%|#5         | 6/40 [00:01<00:05,  5.91it/s]
```

```
    450/499      0.206G     0.0141    0.009211     0.01612          1          320:
15%|#5          | 6/40 [00:01<00:05,  5.91it/s]
    450/499      0.206G     0.0141    0.009211     0.01612          1          320:
18%|#7          | 7/40 [00:01<00:05,  5.66it/s]
    450/499      0.206G    0.01477    0.008514     0.01604          1          320:
18%|#7          | 7/40 [00:01<00:05,  5.66it/s]
    450/499      0.206G    0.01477    0.008514     0.01604          1          320:
20%|##          | 8/40 [00:01<00:05,  5.74it/s]
    450/499      0.206G    0.01554    0.008959     0.01637          4          320:
20%|##          | 8/40 [00:01<00:05,  5.74it/s]
    450/499      0.206G    0.01554    0.008959     0.01637          4          320:
22%|##2         | 9/40 [00:01<00:05,  5.76it/s]
    450/499      0.206G    0.01458    0.008414     0.01625          1          320:
22%|##2         | 9/40 [00:01<00:05,  5.76it/s]
    450/499      0.206G    0.01458    0.008414     0.01625          1          320:
25%|##5         | 10/40 [00:01<00:05,  5.65it/s]
    450/499      0.206G    0.01426    0.008325     0.01707          2          320:
25%|##5         | 10/40 [00:01<00:05,  5.65it/s]
    450/499      0.206G    0.01426    0.008325     0.01707          2          320:
28%|##7         | 11/40 [00:01<00:04,  5.80it/s]
    450/499      0.206G    0.01588    0.008396     0.01778          2          320:
28%|##7         | 11/40 [00:02<00:04,  5.80it/s]
    450/499      0.206G    0.01588    0.008396     0.01778          2          320:
30%|###         | 12/40 [00:02<00:04,  5.65it/s]
    450/499      0.206G    0.01585    0.008182     0.01765          2          320:
30%|###         | 12/40 [00:02<00:04,  5.65it/s]
    450/499      0.206G    0.01585    0.008182     0.01765          2          320:
32%|###2        | 13/40 [00:02<00:04,  5.72it/s]
    450/499      0.206G    0.01869    0.008021     0.01791          2          320:
32%|###2        | 13/40 [00:02<00:04,  5.72it/s]
    450/499      0.206G    0.01869    0.008021     0.01791          2          320:
35%|###5        | 14/40 [00:02<00:04,  5.72it/s]
    450/499      0.206G    0.01958    0.009003     0.01844          4          320:
35%|###5        | 14/40 [00:02<00:04,  5.72it/s]
    450/499      0.206G    0.01958    0.009003     0.01844          4          320:
38%|###7        | 15/40 [00:02<00:04,  5.60it/s]
    450/499      0.206G    0.02013    0.008898     0.01855          2          320:
38%|###7        | 15/40 [00:02<00:04,  5.60it/s]
    450/499      0.206G    0.02013    0.008898     0.01855          2          320:
40%|####        | 16/40 [00:02<00:04,  5.54it/s]
    450/499      0.206G    0.02041    0.008855      0.0186          2          320:
40%|####        | 16/40 [00:03<00:04,  5.54it/s]
    450/499      0.206G    0.02041    0.008855      0.0186          2          320:
42%|####2       | 17/40 [00:03<00:04,  5.40it/s]
    450/499      0.206G    0.02134     0.00871     0.01881          2          320:
42%|####2       | 17/40 [00:03<00:04,  5.40it/s]
    450/499      0.206G    0.02134     0.00871     0.01881          2          320:
45%|####5       | 18/40 [00:03<00:03,  5.56it/s]
```

```
   450/499       0.206G      0.0213    0.008666     0.01861          2          320:
45%|####5    | 18/40 [00:03<00:03,  5.56it/s]
   450/499       0.206G      0.0213    0.008666     0.01861          2          320:
48%|####7    | 19/40 [00:03<00:03,  5.47it/s]
   450/499       0.206G      0.0207    0.008565     0.01847          2          320:
48%|####7    | 19/40 [00:03<00:03,  5.47it/s]
   450/499       0.206G      0.0207    0.008565     0.01847          2          320:
50%|#####    | 20/40 [00:03<00:03,  5.72it/s]
   450/499       0.206G      0.02195    0.00885     0.01863          4          320:
50%|#####    | 20/40 [00:03<00:03,  5.72it/s]
   450/499       0.206G      0.02195    0.00885     0.01863          4          320:
52%|#####2   | 21/40 [00:03<00:03,  5.60it/s]
   450/499       0.206G      0.02161    0.008674    0.01837          2          320:
52%|#####2   | 21/40 [00:03<00:03,  5.60it/s]
   450/499       0.206G      0.02161    0.008674    0.01837          2          320:
55%|#####5   | 22/40 [00:03<00:03,  5.50it/s]
   450/499       0.206G      0.02192    0.008752    0.01875          1          320:
55%|#####5   | 22/40 [00:04<00:03,  5.50it/s]
   450/499       0.206G      0.02192    0.008752    0.01875          1          320:
57%|#####7   | 23/40 [00:04<00:03,  5.31it/s]
   450/499       0.206G      0.02168    0.008943    0.01879          4          320:
57%|#####7   | 23/40 [00:04<00:03,  5.31it/s]
   450/499       0.206G      0.02168    0.008943    0.01879          4          320:
60%|######   | 24/40 [00:04<00:02,  5.45it/s]
   450/499       0.206G      0.02233    0.008916    0.01906          3          320:
60%|######   | 24/40 [00:04<00:02,  5.45it/s]
   450/499       0.206G      0.02233    0.008916    0.01906          3          320:
62%|######2  | 25/40 [00:04<00:02,  5.39it/s]
   450/499       0.206G      0.02185    0.008684    0.01879          1          320:
62%|######2  | 25/40 [00:04<00:02,  5.39it/s]
   450/499       0.206G      0.02185    0.008684    0.01879          1          320:
65%|######5  | 26/40 [00:04<00:02,  5.51it/s]
   450/499       0.206G      0.02185    0.008991    0.01898          4          320:
65%|######5  | 26/40 [00:04<00:02,  5.51it/s]
   450/499       0.206G      0.02185    0.008991    0.01898          4          320:
68%|######7  | 27/40 [00:04<00:02,  5.46it/s]
   450/499       0.206G      0.02163    0.008943    0.01889          1          320:
68%|######7  | 27/40 [00:04<00:02,  5.46it/s]
   450/499       0.206G      0.02163    0.008943    0.01889          1          320:
70%|#######  | 28/40 [00:04<00:02,  5.57it/s]
   450/499       0.206G      0.02172    0.00919     0.0188           4          320:
70%|#######  | 28/40 [00:05<00:02,  5.57it/s]
   450/499       0.206G      0.02172    0.00919     0.0188           4          320:
72%|#######2 | 29/40 [00:05<00:02,  5.36it/s]
   450/499       0.206G      0.02134    0.008982    0.01875          1          320:
72%|#######2 | 29/40 [00:05<00:02,  5.36it/s]
   450/499       0.206G      0.02134    0.008982    0.01875          1          320:
75%|#######5 | 30/40 [00:05<00:01,  5.63it/s]
```

```
    450/499      0.206G      0.02126    0.009158     0.01872          4           320:
75%|#######5  | 30/40 [00:05<00:01,  5.63it/s]
    450/499      0.206G      0.02126    0.009158     0.01872          4           320:
78%|#######7  | 31/40 [00:05<00:01,  5.51it/s]
    450/499      0.206G      0.02115    0.009321     0.01885          4           320:
78%|#######7  | 31/40 [00:05<00:01,  5.51it/s]
    450/499      0.206G      0.02115    0.009321     0.01885          4           320:
80%|########  | 32/40 [00:05<00:01,  5.60it/s]
    450/499      0.206G      0.02173    0.009355     0.01948          3           320:
80%|########  | 32/40 [00:05<00:01,  5.60it/s]
    450/499      0.206G      0.02173    0.009355     0.01948          3           320:
82%|########2 | 33/40 [00:05<00:01,  5.67it/s]
    450/499      0.206G      0.02169    0.00951      0.01936          4           320:
82%|########2 | 33/40 [00:06<00:01,  5.67it/s]
    450/499      0.206G      0.02169    0.00951      0.01936          4           320:
85%|########5 | 34/40 [00:06<00:01,  5.54it/s]
    450/499      0.206G      0.02181    0.009682     0.01941          4           320:
85%|########5 | 34/40 [00:06<00:01,  5.54it/s]
    450/499      0.206G      0.02181    0.009682     0.01941          4           320:
88%|########7 | 35/40 [00:06<00:00,  5.62it/s]
    450/499      0.206G      0.02144    0.009536     0.01927          1           320:
88%|########7 | 35/40 [00:06<00:00,  5.62it/s]
    450/499      0.206G      0.02144    0.009536     0.01927          1           320:
90%|######### | 36/40 [00:06<00:00,  5.67it/s]
    450/499      0.206G      0.02118    0.009382     0.01912          1           320:
90%|######### | 36/40 [00:06<00:00,  5.67it/s]
    450/499      0.206G      0.02118    0.009382     0.01912          1           320:
92%|#########2| 37/40 [00:06<00:00,  5.70it/s]
    450/499      0.206G      0.02138    0.009444     0.01923          4           320:
92%|#########2| 37/40 [00:06<00:00,  5.70it/s]
    450/499      0.206G      0.02138    0.009444     0.01923          4           320:
95%|#########5| 38/40 [00:06<00:00,  5.59it/s]
    450/499      0.206G      0.02101    0.009277      0.0191          1           320:
95%|#########5| 38/40 [00:06<00:00,  5.59it/s]
    450/499      0.206G      0.02101    0.009277      0.0191          1           320:
98%|#########7| 39/40 [00:06<00:00,  5.66it/s]
    450/499      0.206G       0.0216    0.009225     0.01925          2           320:
98%|#########7| 39/40 [00:07<00:00,  5.66it/s]
    450/499      0.206G       0.0216    0.009225     0.01925          2           320:
100%|##########| 40/40 [00:07<00:00,  5.53it/s]
    450/499      0.206G       0.0216    0.009225     0.01925          2           320:
100%|##########| 40/40 [00:07<00:00,  5.60it/s]


             Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
             Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:00, 18.29it/s]
             Class      Images  Instances          P          R      mAP50
```

```
mAP50-95:  20%|##        | 4/20 [00:00<00:00, 18.28it/s]
              Class    Images  Instances         P         R      mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 17.15it/s]
              Class    Images  Instances         P         R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 17.57it/s]
              Class    Images  Instances         P         R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 17.81it/s]
              Class    Images  Instances         P         R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 17.97it/s]
              Class    Images  Instances         P         R      mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 18.07it/s]
              Class    Images  Instances         P         R      mAP50
mAP50-95:  80%|######## | 16/20 [00:00<00:00, 16.61it/s]
              Class    Images  Instances         P         R      mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 17.44it/s]
              Class    Images  Instances         P         R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.71it/s]
                all        40         40      0.964     0.969     0.992
0.811

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
    451/499     0.206G    0.01327   0.008446    0.01571          2        320:
0%|          | 0/40 [00:00<?, ?it/s]
    451/499     0.206G    0.01327   0.008446    0.01571          2        320:
2%|2        | 1/40 [00:00<00:06,  5.79it/s]
    451/499     0.206G     0.0182   0.006836    0.02442          2        320:
2%|2        | 1/40 [00:00<00:06,  5.79it/s]
    451/499     0.206G     0.0182   0.006836    0.02442          2        320:
5%|5        | 2/40 [00:00<00:06,  5.51it/s]
    451/499     0.206G    0.01965    0.00935    0.02706          3        320:
5%|5        | 2/40 [00:00<00:06,  5.51it/s]
    451/499     0.206G    0.01965    0.00935    0.02706          3        320:
8%|7        | 3/40 [00:00<00:06,  5.59it/s]
    451/499     0.206G     0.0205    0.00828    0.02378          1        320:
8%|7        | 3/40 [00:00<00:06,  5.59it/s]
    451/499     0.206G     0.0205    0.00828    0.02378          1        320:
10%|#       | 4/40 [00:00<00:06,  5.71it/s]
    451/499     0.206G    0.01845    0.00728    0.02295          1        320:
10%|#       | 4/40 [00:00<00:06,  5.71it/s]
    451/499     0.206G    0.01845    0.00728    0.02295          1        320:
12%|#2      | 5/40 [00:00<00:05,  5.94it/s]
    451/499     0.206G    0.02046   0.008066    0.02353          4        320:
12%|#2      | 5/40 [00:01<00:05,  5.94it/s]
    451/499     0.206G    0.02046   0.008066    0.02353          4        320:
15%|#5      | 6/40 [00:01<00:05,  5.70it/s]
    451/499     0.206G    0.02115   0.008582    0.02354          4        320:
```

```
15%|#5         | 6/40 [00:01<00:05,  5.70it/s]
     451/499    0.206G    0.02115   0.008582   0.02354       4        320:
18%|#7         | 7/40 [00:01<00:05,  5.74it/s]
     451/499    0.206G    0.02592   0.008122   0.02407       2        320:
18%|#7         | 7/40 [00:01<00:05,  5.74it/s]
     451/499    0.206G    0.02592   0.008122   0.02407       2        320:
20%|##         | 8/40 [00:01<00:05,  5.61it/s]
     451/499    0.206G    0.02522   0.008908   0.02343       4        320:
20%|##         | 8/40 [00:01<00:05,  5.61it/s]
     451/499    0.206G    0.02522   0.008908   0.02343       4        320:
22%|##2        | 9/40 [00:01<00:05,  5.56it/s]
     451/499    0.206G    0.02388   0.008302   0.02223       1        320:
22%|##2        | 9/40 [00:01<00:05,  5.56it/s]
     451/499    0.206G    0.02388   0.008302   0.02223       1        320:
25%|##5        | 10/40 [00:01<00:05,  5.59it/s]
     451/499    0.206G    0.02255   0.008074   0.02146       1        320:
25%|##5        | 10/40 [00:01<00:05,  5.59it/s]
     451/499    0.206G    0.02255   0.008074   0.02146       1        320:
28%|##7        | 11/40 [00:01<00:05,  5.66it/s]
     451/499    0.206G     0.0221   0.00778    0.02087       1        320:
28%|##7        | 11/40 [00:02<00:05,  5.66it/s]
     451/499    0.206G     0.0221   0.00778    0.02087       1        320:
30%|###        | 12/40 [00:02<00:05,  5.40it/s]
     451/499    0.206G    0.02253   0.007858   0.02065       2        320:
30%|###        | 12/40 [00:02<00:05,  5.40it/s]
     451/499    0.206G    0.02253   0.007858   0.02065       2        320:
32%|###2       | 13/40 [00:02<00:04,  5.51it/s]
     451/499    0.206G    0.02346   0.007831   0.02034       2        320:
32%|###2       | 13/40 [00:02<00:04,  5.51it/s]
     451/499    0.206G    0.02346   0.007831   0.02034       2        320:
35%|###5       | 14/40 [00:02<00:04,  5.45it/s]
     451/499    0.206G    0.02269   0.007714   0.01984       2        320:
35%|###5       | 14/40 [00:02<00:04,  5.45it/s]
     451/499    0.206G    0.02269   0.007714   0.01984       2        320:
38%|###7       | 15/40 [00:02<00:04,  5.54it/s]
     451/499    0.206G    0.02202   0.007648   0.01989       2        320:
38%|###7       | 15/40 [00:02<00:04,  5.54it/s]
     451/499    0.206G    0.02202   0.007648   0.01989       2        320:
40%|####       | 16/40 [00:02<00:04,  5.62it/s]
     451/499    0.206G     0.0218   0.007452   0.01958       1        320:
40%|####       | 16/40 [00:03<00:04,  5.62it/s]
     451/499    0.206G     0.0218   0.007452   0.01958       1        320:
42%|####2      | 17/40 [00:03<00:04,  5.53it/s]
     451/499    0.206G    0.02233   0.00773    0.02008       4        320:
42%|####2      | 17/40 [00:03<00:04,  5.53it/s]
     451/499    0.206G    0.02233   0.00773    0.02008       4        320:
45%|####5      | 18/40 [00:03<00:03,  5.58it/s]
     451/499    0.206G    0.02169   0.007526   0.01968       1        320:
```

```
45%|####5      | 18/40 [00:03<00:03,  5.58it/s]
    451/499      0.206G    0.02169   0.007526    0.01968        1        320:
48%|####7      | 19/40 [00:03<00:03,  5.65it/s]
    451/499      0.206G    0.02106   0.00745     0.01938        2        320:
48%|####7      | 19/40 [00:03<00:03,  5.65it/s]
    451/499      0.206G    0.02106   0.00745     0.01938        2        320:
50%|#####      | 20/40 [00:03<00:03,  5.70it/s]
    451/499      0.206G    0.02093   0.00766     0.01939        4        320:
50%|#####      | 20/40 [00:03<00:03,  5.70it/s]
    451/499      0.206G    0.02093   0.00766     0.01939        4        320:
52%|#####2     | 21/40 [00:03<00:03,  5.58it/s]
    451/499      0.206G    0.02059   0.007704    0.01923        2        320:
52%|#####2     | 21/40 [00:03<00:03,  5.58it/s]
    451/499      0.206G    0.02059   0.007704    0.01923        2        320:
55%|#####5     | 22/40 [00:03<00:03,  5.46it/s]
    451/499      0.206G    0.02211   0.00777     0.01921        2        320:
55%|#####5     | 22/40 [00:04<00:03,  5.46it/s]
    451/499      0.206G    0.02211   0.00777     0.01921        2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.32it/s]
    451/499      0.206G    0.02194   0.008266    0.0191         4        320:
57%|#####7     | 23/40 [00:04<00:03,  5.32it/s]
    451/499      0.206G    0.02194   0.008266    0.0191         4        320:
60%|######     | 24/40 [00:04<00:03,  5.08it/s]
    451/499      0.206G    0.02246   0.008237    0.0194         2        320:
60%|######     | 24/40 [00:04<00:03,  5.08it/s]
    451/499      0.206G    0.02246   0.008237    0.0194         2        320:
62%|######2    | 25/40 [00:04<00:02,  5.03it/s]
    451/499      0.206G    0.02313   0.008179    0.01931        2        320:
62%|######2    | 25/40 [00:04<00:02,  5.03it/s]
    451/499      0.206G    0.02313   0.008179    0.01931        2        320:
65%|######5    | 26/40 [00:04<00:02,  4.84it/s]
    451/499      0.206G    0.02317   0.008373    0.01935        4        320:
65%|######5    | 26/40 [00:04<00:02,  4.84it/s]
    451/499      0.206G    0.02317   0.008373    0.01935        4        320:
68%|######7    | 27/40 [00:04<00:02,  4.89it/s]
    451/499      0.206G    0.02361   0.008325    0.01916        2        320:
68%|######7    | 27/40 [00:05<00:02,  4.89it/s]
    451/499      0.206G    0.02361   0.008325    0.01916        2        320:
70%|#######    | 28/40 [00:05<00:02,  4.90it/s]
    451/499      0.206G    0.02347   0.00856     0.01913        4        320:
70%|#######    | 28/40 [00:05<00:02,  4.90it/s]
    451/499      0.206G    0.02347   0.00856     0.01913        4        320:
72%|#######2   | 29/40 [00:05<00:02,  4.77it/s]
    451/499      0.206G    0.02364   0.008734    0.01911        4        320:
72%|#######2   | 29/40 [00:05<00:02,  4.77it/s]
    451/499      0.206G    0.02364   0.008734    0.01911        4        320:
75%|#######5   | 30/40 [00:05<00:02,  4.71it/s]
    451/499      0.206G    0.02391   0.008944    0.01952        4        320:
```

```
75%|#######5   | 30/40 [00:05<00:02,  4.71it/s]
     451/499      0.206G      0.02391    0.008944      0.01952          4          320:
78%|#######7   | 31/40 [00:05<00:01,  4.72it/s]
     451/499      0.206G      0.02316    0.008872      0.01891          0          320:
78%|#######7   | 31/40 [00:05<00:01,  4.72it/s]
     451/499      0.206G      0.02316    0.008872      0.01891          0          320:
80%|########   | 32/40 [00:05<00:01,  5.18it/s]
     451/499      0.206G      0.02285    0.008876      0.01879          2          320:
80%|########   | 32/40 [00:06<00:01,  5.18it/s]
     451/499      0.206G      0.02285    0.008876      0.01879          2          320:
82%|########2  | 33/40 [00:06<00:01,  5.22it/s]
     451/499      0.206G      0.02252    0.008892      0.01865          1          320:
82%|########2  | 33/40 [00:06<00:01,  5.22it/s]
     451/499      0.206G      0.02252    0.008892      0.01865          1          320:
85%|########5  | 34/40 [00:06<00:01,  4.99it/s]
     451/499      0.206G       0.0221   0.008729      0.01842          1          320:
85%|########5  | 34/40 [00:06<00:01,  4.99it/s]
     451/499      0.206G       0.0221   0.008729      0.01842          1          320:
88%|########7  | 35/40 [00:06<00:00,  5.08it/s]
     451/499      0.206G      0.02184   0.008578      0.01828          1          320:
88%|########7  | 35/40 [00:06<00:00,  5.08it/s]
     451/499      0.206G      0.02184   0.008578      0.01828          1          320:
90%|######### | 36/40 [00:06<00:00,  5.15it/s]
     451/499      0.206G      0.02222   0.008537      0.01822          2          320:
90%|######### | 36/40 [00:06<00:00,  5.15it/s]
     451/499      0.206G      0.02222   0.008537      0.01822          2          320:
92%|#########2| 37/40 [00:06<00:00,  5.22it/s]
     451/499      0.206G      0.02216   0.008661      0.01831          4          320:
92%|#########2| 37/40 [00:07<00:00,  5.22it/s]
     451/499      0.206G      0.02216   0.008661      0.01831          4          320:
95%|#########5| 38/40 [00:07<00:00,  5.38it/s]
     451/499      0.206G      0.02232   0.009076      0.01859          4          320:
95%|#########5| 38/40 [00:07<00:00,  5.38it/s]
     451/499      0.206G      0.02232   0.009076      0.01859          4          320:
98%|#########7| 39/40 [00:07<00:00,  5.51it/s]
     451/499      0.206G      0.02303   0.008984       0.0186          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.51it/s]
     451/499      0.206G      0.02303   0.008984       0.0186          2          320:
100%|##########| 40/40 [00:07<00:00,  5.43it/s]
     451/499      0.206G      0.02303   0.008984       0.0186          2          320:
100%|##########| 40/40 [00:07<00:00,  5.34it/s]


                Class       Images  Instances            P           R        mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
                Class       Images  Instances            P           R        mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:01, 15.97it/s]
                Class       Images  Instances            P           R        mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:00, 17.25it/s]
```

```
                Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 17.71it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 16.84it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 17.33it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 17.65it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 17.07it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:00<00:00, 17.44it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.65it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.10it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.24it/s]
                  all         40         40      0.955      0.929      0.994
0.816

        Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

   0%|            | 0/40 [00:00<?, ?it/s]
      452/499     0.206G    0.02492    0.01397    0.02227          4       320:
0%|            | 0/40 [00:00<?, ?it/s]
      452/499     0.206G    0.02492    0.01397    0.02227          4       320:
2%|2           | 1/40 [00:00<00:06,  5.70it/s]
      452/499     0.206G    0.02183    0.01198    0.01825          2       320:
2%|2           | 1/40 [00:00<00:06,  5.70it/s]
      452/499     0.206G    0.02183    0.01198    0.01825          2       320:
5%|5           | 2/40 [00:00<00:06,  5.77it/s]
      452/499     0.206G    0.03273    0.01148    0.01822          3       320:
5%|5           | 2/40 [00:00<00:06,  5.77it/s]
      452/499     0.206G    0.03273    0.01148    0.01822          3       320:
8%|7           | 3/40 [00:00<00:06,  5.51it/s]
      452/499     0.206G    0.03155    0.01258    0.01948          4       320:
8%|7           | 3/40 [00:00<00:06,  5.51it/s]
      452/499     0.206G    0.03155    0.01258    0.01948          4       320:
10%|#           | 4/40 [00:00<00:06,  5.67it/s]
      452/499     0.206G    0.03038    0.01167    0.02058          3       320:
10%|#           | 4/40 [00:00<00:06,  5.67it/s]
      452/499     0.206G    0.03038    0.01167    0.02058          3       320:
12%|#2          | 5/40 [00:00<00:06,  5.72it/s]
      452/499     0.206G    0.02693    0.01069    0.02048          2       320:
12%|#2          | 5/40 [00:01<00:06,  5.72it/s]
      452/499     0.206G    0.02693    0.01069    0.02048          2       320:
15%|#5          | 6/40 [00:01<00:06,  5.57it/s]
```

```
   452/499      0.206G    0.02554    0.01081     0.0203         4          320:
15%|#5         | 6/40 [00:01<00:06,  5.57it/s]
   452/499      0.206G    0.02554    0.01081     0.0203         4          320:
18%|#7         | 7/40 [00:01<00:05,  5.64it/s]
   452/499      0.206G    0.02356   0.009895    0.01963         1          320:
18%|#7         | 7/40 [00:01<00:05,  5.64it/s]
   452/499      0.206G    0.02356   0.009895    0.01963         1          320:
20%|##         | 8/40 [00:01<00:05,  5.70it/s]
   452/499      0.206G    0.02367    0.01051    0.02059         4          320:
20%|##         | 8/40 [00:01<00:05,  5.70it/s]
   452/499      0.206G    0.02367    0.01051    0.02059         4          320:
22%|##2        | 9/40 [00:01<00:05,  5.56it/s]
   452/499      0.206G    0.02259    0.01031    0.02008         2          320:
22%|##2        | 9/40 [00:01<00:05,  5.56it/s]
   452/499      0.206G    0.02259    0.01031    0.02008         2          320:
25%|##5        | 10/40 [00:01<00:05,  5.63it/s]
   452/499      0.206G    0.02198    0.01006    0.01945         2          320:
25%|##5        | 10/40 [00:01<00:05,  5.63it/s]
   452/499      0.206G    0.02198    0.01006    0.01945         2          320:
28%|##7        | 11/40 [00:01<00:05,  5.54it/s]
   452/499      0.206G     0.0255   0.009746    0.01943         2          320:
28%|##7        | 11/40 [00:02<00:05,  5.54it/s]
   452/499      0.206G     0.0255   0.009746    0.01943         2          320:
30%|###        | 12/40 [00:02<00:05,  5.42it/s]
   452/499      0.206G    0.02411    0.00923     0.0192         1          320:
30%|###        | 12/40 [00:02<00:05,  5.42it/s]
   452/499      0.206G    0.02411    0.00923     0.0192         1          320:
32%|###2       | 13/40 [00:02<00:04,  5.42it/s]
   452/499      0.206G     0.0242   0.008953    0.01909         2          320:
32%|###2       | 13/40 [00:02<00:04,  5.42it/s]
   452/499      0.206G     0.0242   0.008953    0.01909         2          320:
35%|###5       | 14/40 [00:02<00:04,  5.53it/s]
   452/499      0.206G    0.02426   0.009774    0.01921         4          320:
35%|###5       | 14/40 [00:02<00:04,  5.53it/s]
   452/499      0.206G    0.02426   0.009774    0.01921         4          320:
38%|###7       | 15/40 [00:02<00:04,  5.45it/s]
   452/499      0.206G    0.02422   0.009821    0.01903         2          320:
38%|###7       | 15/40 [00:02<00:04,  5.45it/s]
   452/499      0.206G    0.02422   0.009821    0.01903         2          320:
40%|####       | 16/40 [00:02<00:04,  5.57it/s]
   452/499      0.206G     0.0247     0.0104    0.01963         4          320:
40%|####       | 16/40 [00:03<00:04,  5.57it/s]
   452/499      0.206G     0.0247     0.0104    0.01963         4          320:
42%|####2      | 17/40 [00:03<00:04,  5.36it/s]
   452/499      0.206G    0.02387    0.01016    0.01997         2          320:
42%|####2      | 17/40 [00:03<00:04,  5.36it/s]
   452/499      0.206G    0.02387    0.01016    0.01997         2          320:
45%|####5      | 18/40 [00:03<00:04,  5.49it/s]
```

```
     452/499       0.206G      0.02423     0.01011      0.01978          2          320:
45%|####5      | 18/40 [00:03<00:04,  5.49it/s]
     452/499       0.206G      0.02423     0.01011      0.01978          2          320:
48%|####7      | 19/40 [00:03<00:03,  5.44it/s]
     452/499       0.206G      0.02592     0.01002      0.01975          3          320:
48%|####7      | 19/40 [00:03<00:03,  5.44it/s]
     452/499       0.206G      0.02592     0.01002      0.01975          3          320:
50%|#####      | 20/40 [00:03<00:03,  5.27it/s]
     452/499       0.206G      0.02625     0.009858     0.01955          2          320:
50%|#####      | 20/40 [00:03<00:03,  5.27it/s]
     452/499       0.206G      0.02625     0.009858     0.01955          2          320:
52%|#####2     | 21/40 [00:03<00:03,  5.40it/s]
     452/499       0.206G      0.02728     0.009846     0.01946          3          320:
52%|#####2     | 21/40 [00:04<00:03,  5.40it/s]
     452/499       0.206G      0.02728     0.009846     0.01946          3          320:
55%|#####5     | 22/40 [00:04<00:03,  5.25it/s]
     452/499       0.206G      0.02734     0.01         0.01936          4          320:
55%|#####5     | 22/40 [00:04<00:03,  5.25it/s]
     452/499       0.206G      0.02734     0.01         0.01936          4          320:
57%|#####7     | 23/40 [00:04<00:03,  5.27it/s]
     452/499       0.206G      0.02654     0.009681     0.01918          1          320:
57%|#####7     | 23/40 [00:04<00:03,  5.27it/s]
     452/499       0.206G      0.02654     0.009681     0.01918          1          320:
60%|######     | 24/40 [00:04<00:02,  5.40it/s]
     452/499       0.206G      0.02598     0.009575     0.01903          2          320:
60%|######     | 24/40 [00:04<00:02,  5.40it/s]
     452/499       0.206G      0.02598     0.009575     0.01903          2          320:
62%|######2    | 25/40 [00:04<00:02,  5.56it/s]
     452/499       0.206G      0.02623     0.009434     0.01886          2          320:
62%|######2    | 25/40 [00:04<00:02,  5.56it/s]
     452/499       0.206G      0.02623     0.009434     0.01886          2          320:
65%|######5    | 26/40 [00:04<00:02,  5.63it/s]
     452/499       0.206G      0.02598     0.009263     0.01948          2          320:
65%|######5    | 26/40 [00:04<00:02,  5.63it/s]
     452/499       0.206G      0.02598     0.009263     0.01948          2          320:
68%|######7    | 27/40 [00:04<00:02,  5.31it/s]
     452/499       0.206G      0.02654     0.009557     0.01976          4          320:
68%|######7    | 27/40 [00:05<00:02,  5.31it/s]
     452/499       0.206G      0.02654     0.009557     0.01976          4          320:
70%|#######    | 28/40 [00:05<00:02,  5.23it/s]
     452/499       0.206G      0.02617     0.009716     0.01969          4          320:
70%|#######    | 28/40 [00:05<00:02,  5.23it/s]
     452/499       0.206G      0.02617     0.009716     0.01969          4          320:
72%|#######2   | 29/40 [00:05<00:02,  5.39it/s]
     452/499       0.206G      0.02687     0.009594     0.0201           2          320:
72%|#######2   | 29/40 [00:05<00:02,  5.39it/s]
     452/499       0.206G      0.02687     0.009594     0.0201           2          320:
75%|#######5   | 30/40 [00:05<00:01,  5.36it/s]
```

```
    452/499      0.206G    0.02623    0.009388     0.01984          1        320:
75%|#######5  | 30/40 [00:05<00:01,  5.36it/s]
    452/499      0.206G    0.02623    0.009388     0.01984          1        320:
78%|#######7  | 31/40 [00:05<00:01,  5.49it/s]
    452/499      0.206G    0.02566     0.0092      0.01966          1        320:
78%|#######7  | 31/40 [00:05<00:01,  5.49it/s]
    452/499      0.206G    0.02566     0.0092      0.01966          1        320:
80%|########  | 32/40 [00:05<00:01,  5.44it/s]
    452/499      0.206G    0.02532     0.00918     0.01961          2        320:
80%|########  | 32/40 [00:06<00:01,  5.44it/s]
    452/499      0.206G    0.02532     0.00918     0.01961          2        320:
82%|########2 | 33/40 [00:06<00:01,  5.41it/s]
    452/499      0.206G    0.02607    0.009448     0.01982          2        320:
82%|########2 | 33/40 [00:06<00:01,  5.41it/s]
    452/499      0.206G    0.02607    0.009448     0.01982          2        320:
85%|########5 | 34/40 [00:06<00:01,  5.52it/s]
    452/499      0.206G    0.02555    0.009346     0.01965          2        320:
85%|########5 | 34/40 [00:06<00:01,  5.52it/s]
    452/499      0.206G    0.02555    0.009346     0.01965          2        320:
88%|########7 | 35/40 [00:06<00:00,  5.51it/s]
    452/499      0.206G    0.02505    0.009179     0.01945          1        320:
88%|########7 | 35/40 [00:06<00:00,  5.51it/s]
    452/499      0.206G    0.02505    0.009179     0.01945          1        320:
90%|######### | 36/40 [00:06<00:00,  5.39it/s]
    452/499      0.206G    0.02481    0.009105     0.01936          2        320:
90%|######### | 36/40 [00:06<00:00,  5.39it/s]
    452/499      0.206G    0.02481    0.009105     0.01936          2        320:
92%|#########2| 37/40 [00:06<00:00,  5.51it/s]
    452/499      0.206G    0.02456    0.009066     0.01937          2        320:
92%|#########2| 37/40 [00:06<00:00,  5.51it/s]
    452/499      0.206G    0.02456    0.009066     0.01937          2        320:
95%|#########5| 38/40 [00:06<00:00,  5.47it/s]
    452/499      0.206G    0.02447    0.009052      0.0194          2        320:
95%|#########5| 38/40 [00:07<00:00,  5.47it/s]
    452/499      0.206G    0.02447    0.009052      0.0194          2        320:
98%|#########7| 39/40 [00:07<00:00,  5.52it/s]
    452/499      0.206G    0.02438    0.009184     0.01941          4        320:
98%|#########7| 39/40 [00:07<00:00,  5.52it/s]
    452/499      0.206G    0.02438    0.009184     0.01941          4        320:
100%|##########| 40/40 [00:07<00:00,  5.46it/s]
    452/499      0.206G    0.02438    0.009184     0.01941          4        320:
100%|##########| 40/40 [00:07<00:00,  5.47it/s]

               Class     Images  Instances          P          R      mAP50
mAP50-95:    0%|              | 0/20 [00:00<?, ?it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:   10%|#         | 2/20 [00:00<00:00, 18.28it/s]
               Class     Images  Instances          P          R      mAP50
```

```
mAP50-95:  20%|##        | 4/20 [00:00<00:00, 18.19it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 16.13it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 16.92it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 17.39it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 17.34it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 17.87it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|######## | 16/20 [00:00<00:00, 18.00it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.32it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.61it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.49it/s]
                 all         40         40      0.972      0.975      0.991
0.79

      Epoch    GPU_mem    box_loss   obj_loss   cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
     453/499    0.206G    0.02767    0.01039    0.02102          4       320:
0%|          | 0/40 [00:00<?, ?it/s]
     453/499    0.206G    0.02767    0.01039    0.02102          4       320:
2%|2         | 1/40 [00:00<00:06,  5.84it/s]
     453/499    0.206G    0.01776    0.00643    0.01706          1       320:
2%|2         | 1/40 [00:00<00:06,  5.84it/s]
     453/499    0.206G    0.01776    0.00643    0.01706          1       320:
5%|5         | 2/40 [00:00<00:06,  5.78it/s]
     453/499    0.206G    0.02296    0.01071    0.01847          4       320:
5%|5         | 2/40 [00:00<00:06,  5.78it/s]
     453/499    0.206G    0.02296    0.01071    0.01847          4       320:
8%|7         | 3/40 [00:00<00:06,  5.57it/s]
     453/499    0.206G    0.02693    0.01123    0.02101          4       320:
8%|7         | 3/40 [00:00<00:06,  5.57it/s]
     453/499    0.206G    0.02693    0.01123    0.02101          4       320:
10%|#         | 4/40 [00:00<00:06,  5.47it/s]
     453/499    0.206G    0.02566    0.01165    0.02027          4       320:
10%|#         | 4/40 [00:00<00:06,  5.47it/s]
     453/499    0.206G    0.02566    0.01165    0.02027          4       320:
12%|#2        | 5/40 [00:00<00:06,  5.57it/s]
     453/499    0.206G    0.02608    0.01102    0.01948          2       320:
12%|#2        | 5/40 [00:01<00:06,  5.57it/s]
     453/499    0.206G    0.02608    0.01102    0.01948          2       320:
```

```
15%|#5         | 6/40 [00:01<00:06,  5.33it/s]
    453/499    0.206G    0.02566    0.01119    0.01971         4        320:
15%|#5         | 6/40 [00:01<00:06,  5.33it/s]
    453/499    0.206G    0.02566    0.01119    0.01971         4        320:
18%|#7         | 7/40 [00:01<00:06,  5.48it/s]
    453/499    0.206G    0.02376    0.01116    0.01899         4        320:
18%|#7         | 7/40 [00:01<00:06,  5.48it/s]
    453/499    0.206G    0.02376    0.01116    0.01899         4        320:
20%|##         | 8/40 [00:01<00:05,  5.56it/s]
    453/499    0.206G    0.02263    0.01051    0.01877         1        320:
20%|##         | 8/40 [00:01<00:05,  5.56it/s]
    453/499    0.206G    0.02263    0.01051    0.01877         1        320:
22%|##2        | 9/40 [00:01<00:05,  5.80it/s]
    453/499    0.206G    0.02156    0.01004    0.01957         2        320:
22%|##2        | 9/40 [00:01<00:05,  5.80it/s]
    453/499    0.206G    0.02156    0.01004    0.01957         2        320:
25%|##5        | 10/40 [00:01<00:05,  5.81it/s]
    453/499    0.206G    0.02111    0.01011    0.0194          2        320:
25%|##5        | 10/40 [00:01<00:05,  5.81it/s]
    453/499    0.206G    0.02111    0.01011    0.0194          2        320:
28%|##7        | 11/40 [00:01<00:05,  5.79it/s]
    453/499    0.206G    0.02165    0.01057    0.02018         4        320:
28%|##7        | 11/40 [00:02<00:05,  5.79it/s]
    453/499    0.206G    0.02165    0.01057    0.02018         4        320:
30%|###        | 12/40 [00:02<00:05,  5.49it/s]
    453/499    0.206G    0.0225     0.01028    0.01978         2        320:
30%|###        | 12/40 [00:02<00:05,  5.49it/s]
    453/499    0.206G    0.0225     0.01028    0.01978         2        320:
32%|###2       | 13/40 [00:02<00:05,  5.29it/s]
    453/499    0.206G    0.02377    0.01015    0.02111         2        320:
32%|###2       | 13/40 [00:02<00:05,  5.29it/s]
    453/499    0.206G    0.02377    0.01015    0.02111         2        320:
35%|###5       | 14/40 [00:02<00:05,  5.07it/s]
    453/499    0.206G    0.02332    0.009965   0.02069         2        320:
35%|###5       | 14/40 [00:02<00:05,  5.07it/s]
    453/499    0.206G    0.02332    0.009965   0.02069         2        320:
38%|###7       | 15/40 [00:02<00:04,  5.02it/s]
    453/499    0.206G    0.02322    0.01029    0.02043         4        320:
38%|###7       | 15/40 [00:02<00:04,  5.02it/s]
    453/499    0.206G    0.02322    0.01029    0.02043         4        320:
40%|####       | 16/40 [00:02<00:04,  4.98it/s]
    453/499    0.206G    0.02304    0.0103     0.02024         2        320:
40%|####       | 16/40 [00:03<00:04,  4.98it/s]
    453/499    0.206G    0.02304    0.0103     0.02024         2        320:
42%|####2      | 17/40 [00:03<00:04,  5.08it/s]
    453/499    0.206G    0.02251    0.01007    0.0199          2        320:
42%|####2      | 17/40 [00:03<00:04,  5.08it/s]
    453/499    0.206G    0.02251    0.01007    0.0199          2        320:
```

```
45%|####5     | 18/40 [00:03<00:04,  4.80it/s]
     453/499     0.206G     0.02183    0.009729    0.01948           1        320:
45%|####5     | 18/40 [00:03<00:04,  4.80it/s]
     453/499     0.206G     0.02183    0.009729    0.01948           1        320:
48%|####7     | 19/40 [00:03<00:04,  4.92it/s]
     453/499     0.206G     0.02129    0.009586    0.01925           2        320:
48%|####7     | 19/40 [00:03<00:04,  4.92it/s]
     453/499     0.206G     0.02129    0.009586    0.01925           2        320:
50%|#####     | 20/40 [00:03<00:04,  4.92it/s]
     453/499     0.206G     0.02108    0.009766    0.01932           4        320:
50%|#####     | 20/40 [00:04<00:04,  4.92it/s]
     453/499     0.206G     0.02108    0.009766    0.01932           4        320:
52%|#####2    | 21/40 [00:04<00:03,  4.91it/s]
     453/499     0.206G     0.02133    0.009804     0.0195           4        320:
52%|#####2    | 21/40 [00:04<00:03,  4.91it/s]
     453/499     0.206G     0.02133    0.009804     0.0195           4        320:
55%|#####5    | 22/40 [00:04<00:03,  4.80it/s]
     453/499     0.206G     0.02107    0.009687     0.0193           2        320:
55%|#####5    | 22/40 [00:04<00:03,  4.80it/s]
     453/499     0.206G     0.02107    0.009687     0.0193           2        320:
57%|#####7    | 23/40 [00:04<00:03,  4.95it/s]
     453/499     0.206G     0.02123    0.009805    0.01956           4        320:
57%|#####7    | 23/40 [00:04<00:03,  4.95it/s]
     453/499     0.206G     0.02123    0.009805    0.01956           4        320:
60%|######    | 24/40 [00:04<00:03,  4.82it/s]
     453/499     0.206G     0.02071    0.009559    0.01963           1        320:
60%|######    | 24/40 [00:04<00:03,  4.82it/s]
     453/499     0.206G     0.02071    0.009559    0.01963           1        320:
62%|######2   | 25/40 [00:04<00:03,  4.97it/s]
     453/499     0.206G     0.02073    0.009734    0.01958           4        320:
62%|######2   | 25/40 [00:05<00:03,  4.97it/s]
     453/499     0.206G     0.02073    0.009734    0.01958           4        320:
65%|######5   | 26/40 [00:05<00:02,  4.97it/s]
     453/499     0.206G      0.0214    0.009823    0.02001           4        320:
65%|######5   | 26/40 [00:05<00:02,  4.97it/s]
     453/499     0.206G      0.0214    0.009823    0.02001           4        320:
68%|######7   | 27/40 [00:05<00:02,  4.94it/s]
     453/499     0.206G     0.02141     0.01002    0.01986           2        320:
68%|######7   | 27/40 [00:05<00:02,  4.94it/s]
     453/499     0.206G     0.02141     0.01002    0.01986           2        320:
70%|#######   | 28/40 [00:05<00:02,  5.17it/s]
     453/499     0.206G     0.02124    0.009961    0.01979           2        320:
70%|#######   | 28/40 [00:05<00:02,  5.17it/s]
     453/499     0.206G     0.02124    0.009961    0.01979           2        320:
72%|#######2  | 29/40 [00:05<00:02,  5.22it/s]
     453/499     0.206G     0.02134    0.009924    0.02001           2        320:
72%|#######2  | 29/40 [00:05<00:02,  5.22it/s]
     453/499     0.206G     0.02134    0.009924    0.02001           2        320:
```

```
75%|#######5   | 30/40 [00:05<00:01,  5.37it/s]
     453/499      0.206G     0.02121    0.009842     0.02024          2         320:
75%|#######5   | 30/40 [00:05<00:01,  5.37it/s]
     453/499      0.206G     0.02121    0.009842     0.02024          2         320:
78%|#######7   | 31/40 [00:05<00:01,  5.49it/s]
     453/499      0.206G     0.02099    0.009767     0.02009          1         320:
78%|#######7   | 31/40 [00:06<00:01,  5.49it/s]
     453/499      0.206G     0.02099    0.009767     0.02009          1         320:
80%|########   | 32/40 [00:06<00:01,  5.50it/s]
     453/499      0.206G     0.02066     0.00972     0.01994          2         320:
80%|########   | 32/40 [00:06<00:01,  5.50it/s]
     453/499      0.206G     0.02066     0.00972     0.01994          2         320:
82%|########2  | 33/40 [00:06<00:01,  5.50it/s]
     453/499      0.206G     0.02005    0.009498     0.01935          0         320:
82%|########2  | 33/40 [00:06<00:01,  5.50it/s]
     453/499      0.206G     0.02005    0.009498     0.01935          0         320:
85%|########5  | 34/40 [00:06<00:01,  5.89it/s]
     453/499      0.206G     0.01977    0.009316     0.01946          1         320:
85%|########5  | 34/40 [00:06<00:01,  5.89it/s]
     453/499      0.206G     0.01977    0.009316     0.01946          1         320:
88%|########7  | 35/40 [00:06<00:00,  5.80it/s]
     453/499      0.206G     0.01974    0.009313      0.0194          3         320:
88%|########7  | 35/40 [00:06<00:00,  5.80it/s]
     453/499      0.206G     0.01974    0.009313      0.0194          3         320:
90%|######### | 36/40 [00:06<00:00,  5.86it/s]
     453/499      0.206G     0.01962    0.009271     0.01933          2         320:
90%|######### | 36/40 [00:06<00:00,  5.86it/s]
     453/499      0.206G     0.01962    0.009271     0.01933          2         320:
92%|#########2| 37/40 [00:06<00:00,  5.69it/s]
     453/499      0.206G     0.01942    0.009177     0.01933          2         320:
92%|#########2| 37/40 [00:07<00:00,  5.69it/s]
     453/499      0.206G     0.01942    0.009177     0.01933          2         320:
95%|#########5| 38/40 [00:07<00:00,  5.70it/s]
     453/499      0.206G     0.01926    0.009189     0.01932          2         320:
95%|#########5| 38/40 [00:07<00:00,  5.70it/s]
     453/499      0.206G     0.01926    0.009189     0.01932          2         320:
98%|#########7| 39/40 [00:07<00:00,  5.75it/s]
     453/499      0.206G     0.01921     0.00911     0.01921          1         320:
98%|#########7| 39/40 [00:07<00:00,  5.75it/s]
     453/499      0.206G     0.01921     0.00911     0.01921          1         320:
100%|##########| 40/40 [00:07<00:00,  5.93it/s]
     453/499      0.206G     0.01921     0.00911     0.01921          1         320:
100%|##########| 40/40 [00:07<00:00,  5.36it/s]

           Class     Images  Instances          P          R       mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
           Class     Images  Instances          P          R       mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:00, 18.28it/s]
```

```
                Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 18.21it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 18.24it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 15.62it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 16.48it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 16.04it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 16.16it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 16.78it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 16.53it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.01it/s]
                  all        40         40      0.972      0.975      0.991
0.79

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    454/499     0.206G    0.00983    0.00399    0.01128          1       320:
0%|           | 0/40 [00:00<?, ?it/s]
    454/499     0.206G    0.00983    0.00399    0.01128          1       320:
2%|2          | 1/40 [00:00<00:06,  6.44it/s]
    454/499     0.206G   0.009654   0.004511    0.01233          1       320:
2%|2          | 1/40 [00:00<00:06,  6.44it/s]
    454/499     0.206G   0.009654   0.004511    0.01233          1       320:
5%|5          | 2/40 [00:00<00:05,  6.34it/s]
    454/499     0.206G    0.01511   0.007337    0.01362          4       320:
5%|5          | 2/40 [00:00<00:05,  6.34it/s]
    454/499     0.206G    0.01511   0.007337    0.01362          4       320:
8%|7          | 3/40 [00:00<00:06,  5.60it/s]
    454/499     0.206G    0.01476   0.006489    0.01381          1       320:
8%|7          | 3/40 [00:00<00:06,  5.60it/s]
    454/499     0.206G    0.01476   0.006489    0.01381          1       320:
10%|#          | 4/40 [00:00<00:06,  5.57it/s]
    454/499     0.206G    0.01739   0.008917    0.01633          4       320:
10%|#          | 4/40 [00:00<00:06,  5.57it/s]
    454/499     0.206G    0.01739   0.008917    0.01633          4       320:
12%|#2         | 5/40 [00:00<00:06,  5.74it/s]
    454/499     0.206G    0.01842    0.01044    0.01719          4       320:
12%|#2         | 5/40 [00:01<00:06,  5.74it/s]
    454/499     0.206G    0.01842    0.01044    0.01719          4       320:
15%|#5         | 6/40 [00:01<00:06,  5.43it/s]
```

154

```
     454/499      0.206G    0.01851    0.00981    0.01704         2         320:
15%|#5        | 6/40 [00:01<00:06,  5.43it/s]
     454/499      0.206G    0.01851    0.00981    0.01704         2         320:
18%|#7        | 7/40 [00:01<00:06,  5.40it/s]
     454/499      0.206G    0.01997    0.01109    0.01799         4         320:
18%|#7        | 7/40 [00:01<00:06,  5.40it/s]
     454/499      0.206G    0.01997    0.01109    0.01799         4         320:
20%|##        | 8/40 [00:01<00:05,  5.53it/s]
     454/499      0.206G    0.01886    0.01026    0.01726         1         320:
20%|##        | 8/40 [00:01<00:05,  5.53it/s]
     454/499      0.206G    0.01886    0.01026    0.01726         1         320:
22%|##2       | 9/40 [00:01<00:05,  5.57it/s]
     454/499      0.206G    0.02174    0.01038    0.01867         2         320:
22%|##2       | 9/40 [00:01<00:05,  5.57it/s]
     454/499      0.206G    0.02174    0.01038    0.01867         2         320:
25%|##5       | 10/40 [00:01<00:05,  5.52it/s]
     454/499      0.206G    0.02072    0.009707   0.01852         1         320:
25%|##5       | 10/40 [00:01<00:05,  5.52it/s]
     454/499      0.206G    0.02072    0.009707   0.01852         1         320:
28%|##7       | 11/40 [00:01<00:05,  5.61it/s]
     454/499      0.206G    0.01982    0.00914    0.01821         1         320:
28%|##7       | 11/40 [00:02<00:05,  5.61it/s]
     454/499      0.206G    0.01982    0.00914    0.01821         1         320:
30%|###       | 12/40 [00:02<00:05,  5.52it/s]
     454/499      0.206G    0.02048    0.009177   0.01827         2         320:
30%|###       | 12/40 [00:02<00:05,  5.52it/s]
     454/499      0.206G    0.02048    0.009177   0.01827         2         320:
32%|###2      | 13/40 [00:02<00:04,  5.58it/s]
     454/499      0.206G    0.02155    0.009092   0.01895         2         320:
32%|###2      | 13/40 [00:02<00:04,  5.58it/s]
     454/499      0.206G    0.02155    0.009092   0.01895         2         320:
35%|###5      | 14/40 [00:02<00:04,  5.23it/s]
     454/499      0.206G    0.02113    0.009277   0.01929         4         320:
35%|###5      | 14/40 [00:02<00:04,  5.23it/s]
     454/499      0.206G    0.02113    0.009277   0.01929         4         320:
38%|###7      | 15/40 [00:02<00:04,  5.13it/s]
     454/499      0.206G    0.0207     0.009105   0.01899         2         320:
38%|###7      | 15/40 [00:02<00:04,  5.13it/s]
     454/499      0.206G    0.0207     0.009105   0.01899         2         320:
40%|####      | 16/40 [00:02<00:04,  5.31it/s]
     454/499      0.206G    0.01999    0.008735   0.01914         1         320:
40%|####      | 16/40 [00:03<00:04,  5.31it/s]
     454/499      0.206G    0.01999    0.008735   0.01914         1         320:
42%|####2     | 17/40 [00:03<00:04,  5.45it/s]
     454/499      0.206G    0.02003    0.00864    0.01892         2         320:
42%|####2     | 17/40 [00:03<00:04,  5.45it/s]
     454/499      0.206G    0.02003    0.00864    0.01892         2         320:
45%|####5     | 18/40 [00:03<00:04,  5.42it/s]
```

```
     454/499      0.206G     0.02021    0.008876     0.01912          4          320:
45%|####5      | 18/40 [00:03<00:04,  5.42it/s]
     454/499      0.206G     0.02021    0.008876     0.01912          4          320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
     454/499      0.206G     0.01995    0.008894     0.01918          4          320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
     454/499      0.206G     0.01995    0.008894     0.01918          4          320:
50%|#####      | 20/40 [00:03<00:03,  5.19it/s]
     454/499      0.206G     0.01945    0.008728     0.01898          2          320:
50%|#####      | 20/40 [00:03<00:03,  5.19it/s]
     454/499      0.206G     0.01945    0.008728     0.01898          2          320:
52%|#####2     | 21/40 [00:03<00:03,  5.24it/s]
     454/499      0.206G     0.02004    0.008819      0.019           4          320:
52%|#####2     | 21/40 [00:04<00:03,  5.24it/s]
     454/499      0.206G     0.02004    0.008819      0.019           4          320:
55%|#####5     | 22/40 [00:04<00:03,  5.26it/s]
     454/499      0.206G     0.01997    0.008757     0.01879          2          320:
55%|#####5     | 22/40 [00:04<00:03,  5.26it/s]
     454/499      0.206G     0.01997    0.008757     0.01879          2          320:
57%|#####7     | 23/40 [00:04<00:03,  5.28it/s]
     454/499      0.206G     0.01984    0.008521     0.01897          1          320:
57%|#####7     | 23/40 [00:04<00:03,  5.28it/s]
     454/499      0.206G     0.01984    0.008521     0.01897          1          320:
60%|######     | 24/40 [00:04<00:02,  5.46it/s]
     454/499      0.206G     0.01935    0.008433     0.01876          2          320:
60%|######     | 24/40 [00:04<00:02,  5.46it/s]
     454/499      0.206G     0.01935    0.008433     0.01876          2          320:
62%|######2    | 25/40 [00:04<00:02,  5.66it/s]
     454/499      0.206G     0.02017    0.008347     0.01891          2          320:
62%|######2    | 25/40 [00:04<00:02,  5.66it/s]
     454/499      0.206G     0.02017    0.008347     0.01891          2          320:
65%|######5    | 26/40 [00:04<00:02,  5.56it/s]
     454/499      0.206G      0.0198    0.008335     0.01872          2          320:
65%|######5    | 26/40 [00:04<00:02,  5.56it/s]
     454/499      0.206G      0.0198    0.008335     0.01872          2          320:
68%|######7    | 27/40 [00:04<00:02,  5.38it/s]
     454/499      0.206G      0.0193    0.008174     0.01853          1          320:
68%|######7    | 27/40 [00:05<00:02,  5.38it/s]
     454/499      0.206G      0.0193    0.008174     0.01853          1          320:
70%|#######    | 28/40 [00:05<00:02,  5.45it/s]
     454/499      0.206G     0.02082    0.008194     0.01857          2          320:
70%|#######    | 28/40 [00:05<00:02,  5.45it/s]
     454/499      0.206G     0.02082    0.008194     0.01857          2          320:
72%|#######2   | 29/40 [00:05<00:02,  5.41it/s]
     454/499      0.206G     0.02108    0.008669     0.01892          4          320:
72%|#######2   | 29/40 [00:05<00:02,  5.41it/s]
     454/499      0.206G     0.02108    0.008669     0.01892          4          320:
75%|#######5   | 30/40 [00:05<00:01,  5.37it/s]
```

156

```
     454/499      0.206G     0.02171    0.00877     0.01893          4          320:
75%|#######5  | 30/40 [00:05<00:01,  5.37it/s]
     454/499      0.206G     0.02171    0.00877     0.01893          4          320:
78%|#######7  | 31/40 [00:05<00:01,  5.45it/s]
     454/499      0.206G     0.02134    0.00866     0.01881          2          320:
78%|#######7  | 31/40 [00:05<00:01,  5.45it/s]
     454/499      0.206G     0.02134    0.00866     0.01881          2          320:
80%|########  | 32/40 [00:05<00:01,  5.60it/s]
     454/499      0.206G     0.02145   0.008679     0.01885          2          320:
80%|########  | 32/40 [00:06<00:01,  5.60it/s]
     454/499      0.206G     0.02145   0.008679     0.01885          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.66it/s]
     454/499      0.206G     0.02221   0.008772     0.01943          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.66it/s]
     454/499      0.206G     0.02221   0.008772     0.01943          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.70it/s]
     454/499      0.206G     0.02296   0.008708     0.01989          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.70it/s]
     454/499      0.206G     0.02296   0.008708     0.01989          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.59it/s]
     454/499      0.206G     0.02289   0.008918     0.01999          4          320:
88%|########7 | 35/40 [00:06<00:00,  5.59it/s]
     454/499      0.206G     0.02289   0.008918     0.01999          4          320:
90%|######### | 36/40 [00:06<00:00,  5.65it/s]
     454/499      0.206G     0.02265   0.008791     0.01983          1          320:
90%|######### | 36/40 [00:06<00:00,  5.65it/s]
     454/499      0.206G     0.02265   0.008791     0.01983          1          320:
92%|#########2| 37/40 [00:06<00:00,  5.70it/s]
     454/499      0.206G      0.023    0.008757      0.0198          2          320:
92%|#########2| 37/40 [00:06<00:00,  5.70it/s]
     454/499      0.206G      0.023    0.008757      0.0198          2          320:
95%|#########5| 38/40 [00:06<00:00,  5.73it/s]
     454/499      0.206G     0.02263   0.008618     0.01959          1          320:
95%|#########5| 38/40 [00:07<00:00,  5.73it/s]
     454/499      0.206G     0.02263   0.008618     0.01959          1          320:
98%|#########7| 39/40 [00:07<00:00,  5.74it/s]
     454/499      0.206G     0.02309   0.008745     0.01976          3          320:
98%|#########7| 39/40 [00:07<00:00,  5.74it/s]
     454/499      0.206G     0.02309   0.008745     0.01976          3          320:
100%|##########| 40/40 [00:07<00:00,  5.77it/s]
     454/499      0.206G     0.02309   0.008745     0.01976          3          320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]


              Class      Images  Instances          P          R       mAP50
mAP50-95:    0%|            | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances          P          R       mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:01, 16.08it/s]
              Class      Images  Instances          P          R       mAP50
```

157

```
mAP50-95:  20%|##        | 4/20 [00:00<00:00, 17.31it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 17.51it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 16.82it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 17.32it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 16.85it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  75%|#######5  | 15/20 [00:00<00:00, 16.41it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  85%|########5 | 17/20 [00:01<00:00, 16.29it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.28it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.98it/s]
                all         40         40      0.98     0.975      0.991
0.787
```

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances	Size

```
  0%|          | 0/40 [00:00<?, ?it/s]
    455/499     0.206G     0.0216     0.01413     0.02029         4       320:
0%|          | 0/40 [00:00<?, ?it/s]
    455/499     0.206G     0.0216     0.01413     0.02029         4       320:
2%|2         | 1/40 [00:00<00:07,  5.33it/s]
    455/499     0.206G     0.01662    0.008568    0.0168          1       320:
2%|2         | 1/40 [00:00<00:07,  5.33it/s]
    455/499     0.206G     0.01662    0.008568    0.0168          1       320:
5%|5         | 2/40 [00:00<00:07,  5.17it/s]
    455/499     0.206G     0.02236    0.01018     0.01982         3       320:
5%|5         | 2/40 [00:00<00:07,  5.17it/s]
    455/499     0.206G     0.02236    0.01018     0.01982         3       320:
8%|7         | 3/40 [00:00<00:07,  5.18it/s]
    455/499     0.206G     0.02264    0.01032     0.01837         2       320:
8%|7         | 3/40 [00:00<00:07,  5.18it/s]
    455/499     0.206G     0.02264    0.01032     0.01837         2       320:
10%|#         | 4/40 [00:00<00:07,  5.08it/s]
    455/499     0.206G     0.02177    0.01106     0.02088         4       320:
10%|#         | 4/40 [00:01<00:07,  5.08it/s]
    455/499     0.206G     0.02177    0.01106     0.02088         4       320:
12%|#2        | 5/40 [00:01<00:07,  4.87it/s]
    455/499     0.206G     0.01922    0.009809    0.02052         1       320:
12%|#2        | 5/40 [00:01<00:07,  4.87it/s]
    455/499     0.206G     0.01922    0.009809    0.02052         1       320:
15%|#5        | 6/40 [00:01<00:06,  4.88it/s]
    455/499     0.206G     0.02079    0.01003     0.02232         3       320:
```

```
15%|#5         | 6/40 [00:01<00:06,  4.88it/s]
     455/499     0.206G     0.02079     0.01003     0.02232         3        320:
18%|#7         | 7/40 [00:01<00:06,  4.90it/s]
     455/499     0.206G     0.01944     0.009365     0.02186         1        320:
18%|#7         | 7/40 [00:01<00:06,  4.90it/s]
     455/499     0.206G     0.01944     0.009365     0.02186         1        320:
20%|##         | 8/40 [00:01<00:06,  5.00it/s]
     455/499     0.206G     0.02282     0.008937     0.02158         2        320:
20%|##         | 8/40 [00:01<00:06,  5.00it/s]
     455/499     0.206G     0.02282     0.008937     0.02158         2        320:
22%|##2         | 9/40 [00:01<00:06,  4.86it/s]
     455/499     0.206G     0.02159     0.008505     0.02185         1        320:
22%|##2         | 9/40 [00:02<00:06,  4.86it/s]
     455/499     0.206G     0.02159     0.008505     0.02185         1        320:
25%|##5         | 10/40 [00:02<00:06,  4.87it/s]
     455/499     0.206G     0.02427     0.008571     0.02147         4        320:
25%|##5         | 10/40 [00:02<00:06,  4.87it/s]
     455/499     0.206G     0.02427     0.008571     0.02147         4        320:
28%|##7         | 11/40 [00:02<00:06,  4.77it/s]
     455/499     0.206G     0.02329     0.008811     0.02199         4        320:
28%|##7         | 11/40 [00:02<00:06,  4.77it/s]
     455/499     0.206G     0.02329     0.008811     0.02199         4        320:
30%|###         | 12/40 [00:02<00:05,  4.71it/s]
     455/499     0.206G     0.02207     0.008346     0.02193         1        320:
30%|###         | 12/40 [00:02<00:05,  4.71it/s]
     455/499     0.206G     0.02207     0.008346     0.02193         1        320:
32%|###2         | 13/40 [00:02<00:05,  4.87it/s]
     455/499     0.206G     0.02246     0.008087     0.02105         1        320:
32%|###2         | 13/40 [00:02<00:05,  4.87it/s]
     455/499     0.206G     0.02246     0.008087     0.02105         1        320:
35%|###5         | 14/40 [00:02<00:05,  5.00it/s]
     455/499     0.206G     0.02243     0.008084     0.02059         2        320:
35%|###5         | 14/40 [00:03<00:05,  5.00it/s]
     455/499     0.206G     0.02243     0.008084     0.02059         2        320:
38%|###7         | 15/40 [00:03<00:05,  4.91it/s]
     455/499     0.206G     0.02156     0.007815     0.0206         1        320:
38%|###7         | 15/40 [00:03<00:05,  4.91it/s]
     455/499     0.206G     0.02156     0.007815     0.0206         1        320:
40%|####         | 16/40 [00:03<00:04,  5.08it/s]
     455/499     0.206G     0.02252     0.007846     0.02256         2        320:
40%|####         | 16/40 [00:03<00:04,  5.08it/s]
     455/499     0.206G     0.02252     0.007846     0.02256         2        320:
42%|####2         | 17/40 [00:03<00:04,  5.03it/s]
     455/499     0.206G     0.02334     0.007775     0.02433         2        320:
42%|####2         | 17/40 [00:03<00:04,  5.03it/s]
     455/499     0.206G     0.02334     0.007775     0.02433         2        320:
45%|####5         | 18/40 [00:03<00:04,  5.24it/s]
     455/499     0.206G     0.02279     0.007535     0.02361         1        320:
```

```
45%|####5       | 18/40 [00:03<00:04,  5.24it/s]
     455/499       0.206G     0.02279    0.007535    0.02361         1         320:
48%|####7       | 19/40 [00:03<00:03,  5.40it/s]
     455/499       0.206G     0.02201    0.007319    0.02303         1         320:
48%|####7       | 19/40 [00:03<00:03,  5.40it/s]
     455/499       0.206G     0.02201    0.007319    0.02303         1         320:
50%|#####       | 20/40 [00:03<00:03,  5.52it/s]
     455/499       0.206G     0.02141    0.007249    0.02314         2         320:
50%|#####       | 20/40 [00:04<00:03,  5.52it/s]
     455/499       0.206G     0.02141    0.007249    0.02314         2         320:
52%|#####2      | 21/40 [00:04<00:03,  5.64it/s]
     455/499       0.206G     0.02153    0.007691    0.02302         4         320:
52%|#####2      | 21/40 [00:04<00:03,  5.64it/s]
     455/499       0.206G     0.02153    0.007691    0.02302         4         320:
55%|#####5      | 22/40 [00:04<00:03,  5.78it/s]
     455/499       0.206G     0.02091    0.007467    0.02255         1         320:
55%|#####5      | 22/40 [00:04<00:03,  5.78it/s]
     455/499       0.206G     0.02091    0.007467    0.02255         1         320:
57%|#####7      | 23/40 [00:04<00:03,  5.49it/s]
     455/499       0.206G     0.02155    0.007421    0.02226         2         320:
57%|#####7      | 23/40 [00:04<00:03,  5.49it/s]
     455/499       0.206G     0.02155    0.007421    0.02226         2         320:
60%|######      | 24/40 [00:04<00:03,  5.30it/s]
     455/499       0.206G     0.02118    0.007274    0.02198         1         320:
60%|######      | 24/40 [00:04<00:03,  5.30it/s]
     455/499       0.206G     0.02118    0.007274    0.02198         1         320:
62%|######2     | 25/40 [00:04<00:02,  5.45it/s]
     455/499       0.206G     0.02076    0.007128    0.02168         1         320:
62%|######2     | 25/40 [00:05<00:02,  5.45it/s]
     455/499       0.206G     0.02076    0.007128    0.02168         1         320:
65%|######5     | 26/40 [00:05<00:02,  5.55it/s]
     455/499       0.206G     0.02072    0.007526    0.02149         4         320:
65%|######5     | 26/40 [00:05<00:02,  5.55it/s]
     455/499       0.206G     0.02072    0.007526    0.02149         4         320:
68%|######7     | 27/40 [00:05<00:02,  5.46it/s]
     455/499       0.206G     0.02036    0.007375    0.02121         1         320:
68%|######7     | 27/40 [00:05<00:02,  5.46it/s]
     455/499       0.206G     0.02036    0.007375    0.02121         1         320:
70%|#######     | 28/40 [00:05<00:02,  5.42it/s]
     455/499       0.206G     0.02051    0.007533    0.02094         2         320:
70%|#######     | 28/40 [00:05<00:02,  5.42it/s]
     455/499       0.206G     0.02051    0.007533    0.02094         2         320:
72%|#######2    | 29/40 [00:05<00:01,  5.54it/s]
     455/499       0.206G     0.02041    0.007432    0.02081         2         320:
72%|#######2    | 29/40 [00:05<00:01,  5.54it/s]
     455/499       0.206G     0.02041    0.007432    0.02081         2         320:
75%|#######5    | 30/40 [00:05<00:01,  5.62it/s]
     455/499       0.206G     0.02062    0.007484    0.02104         2         320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.62it/s]
    455/499     0.206G     0.02062    0.007484    0.02104       2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.53it/s]
    455/499     0.206G     0.02022    0.007336    0.02079       1        320:
78%|#######7  | 31/40 [00:06<00:01,  5.53it/s]
    455/499     0.206G     0.02022    0.007336    0.02079       1        320:
80%|########  | 32/40 [00:06<00:01,  5.77it/s]
    455/499     0.206G     0.01984    0.007249    0.02073       1        320:
80%|########  | 32/40 [00:06<00:01,  5.77it/s]
    455/499     0.206G     0.01984    0.007249    0.02073       1        320:
82%|########2 | 33/40 [00:06<00:01,  5.76it/s]
    455/499     0.206G     0.01987    0.007253    0.02118       2        320:
82%|########2 | 33/40 [00:06<00:01,  5.76it/s]
    455/499     0.206G     0.01987    0.007253    0.02118       2        320:
85%|########5 | 34/40 [00:06<00:01,  5.62it/s]
    455/499     0.206G     0.01962    0.007159    0.02107       2        320:
85%|########5 | 34/40 [00:06<00:01,  5.62it/s]
    455/499     0.206G     0.01962    0.007159    0.02107       2        320:
88%|########7 | 35/40 [00:06<00:00,  5.68it/s]
    455/499     0.206G     0.01951    0.007093    0.02085       2        320:
88%|########7 | 35/40 [00:06<00:00,  5.68it/s]
    455/499     0.206G     0.01951    0.007093    0.02085       2        320:
90%|######### | 36/40 [00:06<00:00,  5.69it/s]
    455/499     0.206G     0.01942    0.007213    0.02076       4        320:
90%|######### | 36/40 [00:06<00:00,  5.69it/s]
    455/499     0.206G     0.01942    0.007213    0.02076       4        320:
92%|#########2| 37/40 [00:06<00:00,  5.58it/s]
    455/499     0.206G     0.01946    0.00727     0.02067       2        320:
92%|#########2| 37/40 [00:07<00:00,  5.58it/s]
    455/499     0.206G     0.01946    0.00727     0.02067       2        320:
95%|#########5| 38/40 [00:07<00:00,  5.80it/s]
    455/499     0.206G     0.01948    0.00751     0.02063       4        320:
95%|#########5| 38/40 [00:07<00:00,  5.80it/s]
    455/499     0.206G     0.01948    0.00751     0.02063       4        320:
98%|#########7| 39/40 [00:07<00:00,  5.79it/s]
    455/499     0.206G     0.01967    0.007664    0.02062       3        320:
98%|#########7| 39/40 [00:07<00:00,  5.79it/s]
    455/499     0.206G     0.01967    0.007664    0.02062       3        320:
100%|##########| 40/40 [00:07<00:00,  5.64it/s]
    455/499     0.206G     0.01967    0.007664    0.02062       3        320:
100%|##########| 40/40 [00:07<00:00,  5.33it/s]


            Class      Images  Instances         P        R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
            Class      Images  Instances         P        R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 16.00it/s]
            Class      Images  Instances         P        R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:01, 14.78it/s]
```

```
                    Class      Images  Instances           P           R        mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 16.19it/s]
                    Class      Images  Instances           P           R        mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 16.96it/s]
                    Class      Images  Instances           P           R        mAP50
mAP50-95:  50%|#####        | 10/20 [00:00<00:00, 17.41it/s]
                    Class      Images  Instances           P           R        mAP50
mAP50-95:  60%|######       | 12/20 [00:00<00:00, 17.70it/s]
                    Class      Images  Instances           P           R        mAP50
mAP50-95:  70%|#######      | 14/20 [00:00<00:00, 17.70it/s]
                    Class      Images  Instances           P           R        mAP50
mAP50-95:  80%|########     | 16/20 [00:00<00:00, 17.19it/s]
                    Class      Images  Instances           P           R        mAP50
mAP50-95:  90%|#########    | 18/20 [00:01<00:00, 17.49it/s]
                    Class      Images  Instances           P           R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.75it/s]
                    Class      Images  Instances           P           R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.23it/s]
                      all         40          40        0.98       0.975       0.991
0.787

       Epoch     GPU_mem    box_loss    obj_loss    cls_loss   Instances        Size

  0%|            | 0/40 [00:00<?, ?it/s]
     456/499      0.206G      0.0451    0.008728     0.04184           2        320:
0%|           | 0/40 [00:00<?, ?it/s]
     456/499      0.206G      0.0451    0.008728     0.04184           2        320:
2%|2          | 1/40 [00:00<00:06,  6.40it/s]
     456/499      0.206G      0.0358    0.007232     0.04962           2        320:
2%|2          | 1/40 [00:00<00:06,  6.40it/s]
     456/499      0.206G      0.0358    0.007232     0.04962           2        320:
5%|5          | 2/40 [00:00<00:06,  5.44it/s]
     456/499      0.206G     0.02961    0.007378     0.03763           2        320:
5%|5          | 2/40 [00:00<00:06,  5.44it/s]
     456/499      0.206G     0.02961    0.007378     0.03763           2        320:
8%|7          | 3/40 [00:00<00:06,  5.57it/s]
     456/499      0.206G     0.02699    0.008185     0.03471           4        320:
8%|7          | 3/40 [00:00<00:06,  5.57it/s]
     456/499      0.206G     0.02699    0.008185     0.03471           4        320:
10%|#          | 4/40 [00:00<00:06,  5.29it/s]
     456/499      0.206G     0.02879    0.008346     0.03451           2        320:
10%|#          | 4/40 [00:00<00:06,  5.29it/s]
     456/499      0.206G     0.02879    0.008346     0.03451           2        320:
12%|#2         | 5/40 [00:00<00:06,  5.28it/s]
     456/499      0.206G     0.02603    0.008422     0.03126           2        320:
12%|#2         | 5/40 [00:01<00:06,  5.28it/s]
     456/499      0.206G     0.02603    0.008422     0.03126           2        320:
15%|#5         | 6/40 [00:01<00:06,  5.62it/s]
```

```
    456/499       0.206G    0.02368    0.007918    0.02921       2           320:
15%|#5          | 6/40 [00:01<00:06,  5.62it/s]
    456/499       0.206G    0.02368    0.007918    0.02921       2           320:
18%|#7          | 7/40 [00:01<00:05,  5.52it/s]
    456/499       0.206G    0.02282    0.007583    0.02743       1           320:
18%|#7          | 7/40 [00:01<00:05,  5.52it/s]
    456/499       0.206G    0.02282    0.007583    0.02743       1           320:
20%|##          | 8/40 [00:01<00:05,  5.47it/s]
    456/499       0.206G    0.02413    0.008464    0.02793       4           320:
20%|##          | 8/40 [00:01<00:05,  5.47it/s]
    456/499       0.206G    0.02413    0.008464    0.02793       4           320:
22%|##2         | 9/40 [00:01<00:05,  5.55it/s]
    456/499       0.206G    0.02612    0.008252    0.02659       2           320:
22%|##2         | 9/40 [00:01<00:05,  5.55it/s]
    456/499       0.206G    0.02612    0.008252    0.02659       2           320:
25%|##5         | 10/40 [00:01<00:05,  5.48it/s]
    456/499       0.206G    0.02703    0.008351    0.02687       2           320:
25%|##5         | 10/40 [00:02<00:05,  5.48it/s]
    456/499       0.206G    0.02703    0.008351    0.02687       2           320:
28%|##7         | 11/40 [00:02<00:05,  5.28it/s]
    456/499       0.206G    0.02584    0.007999    0.02618       1           320:
28%|##7         | 11/40 [00:02<00:05,  5.28it/s]
    456/499       0.206G    0.02584    0.007999    0.02618       1           320:
30%|###         | 12/40 [00:02<00:05,  5.43it/s]
    456/499       0.206G    0.02477    0.007925    0.02572       2           320:
30%|###         | 12/40 [00:02<00:05,  5.43it/s]
    456/499       0.206G    0.02477    0.007925    0.02572       2           320:
32%|###2        | 13/40 [00:02<00:04,  5.69it/s]
    456/499       0.206G    0.02468    0.007856    0.02508       2           320:
32%|###2        | 13/40 [00:02<00:04,  5.69it/s]
    456/499       0.206G    0.02468    0.007856    0.02508       2           320:
35%|###5        | 14/40 [00:02<00:04,  5.67it/s]
    456/499       0.206G    0.02553    0.007823    0.02492       2           320:
35%|###5        | 14/40 [00:02<00:04,  5.67it/s]
    456/499       0.206G    0.02553    0.007823    0.02492       2           320:
38%|###7        | 15/40 [00:02<00:04,  5.77it/s]
    456/499       0.206G    0.02497    0.00778     0.02413       2           320:
38%|###7        | 15/40 [00:02<00:04,  5.77it/s]
    456/499       0.206G    0.02497    0.00778     0.02413       2           320:
40%|####        | 16/40 [00:02<00:04,  5.78it/s]
    456/499       0.206G    0.02463    0.007845    0.02497       2           320:
40%|####        | 16/40 [00:03<00:04,  5.78it/s]
    456/499       0.206G    0.02463    0.007845    0.02497       2           320:
42%|####2       | 17/40 [00:03<00:04,  5.60it/s]
    456/499       0.206G    0.02479    0.008453    0.02465       4           320:
42%|####2       | 17/40 [00:03<00:04,  5.60it/s]
    456/499       0.206G    0.02479    0.008453    0.02465       4           320:
45%|####5       | 18/40 [00:03<00:03,  5.54it/s]
```

163

```
    456/499      0.206G     0.02431    0.008283      0.02419          2         320:
45%|####5     | 18/40 [00:03<00:03,  5.54it/s]
    456/499      0.206G     0.02431    0.008283      0.02419          2         320:
48%|####7     | 19/40 [00:03<00:03,  5.77it/s]
    456/499      0.206G       0.024    0.008188      0.02378          2         320:
48%|####7     | 19/40 [00:03<00:03,  5.77it/s]
    456/499      0.206G       0.024    0.008188      0.02378          2         320:
50%|#####     | 20/40 [00:03<00:03,  5.47it/s]
    456/499      0.206G     0.02412    0.008212      0.02464          2         320:
50%|#####     | 20/40 [00:03<00:03,  5.47it/s]
    456/499      0.206G     0.02412    0.008212      0.02464          2         320:
52%|#####2    | 21/40 [00:03<00:03,  5.57it/s]
    456/499      0.206G     0.02494    0.008194      0.02419          2         320:
52%|#####2    | 21/40 [00:03<00:03,  5.57it/s]
    456/499      0.206G     0.02494    0.008194      0.02419          2         320:
55%|#####5    | 22/40 [00:03<00:03,  5.47it/s]
    456/499      0.206G     0.02419    0.008219      0.02373          2         320:
55%|#####5    | 22/40 [00:04<00:03,  5.47it/s]
    456/499      0.206G     0.02419    0.008219      0.02373          2         320:
57%|#####7    | 23/40 [00:04<00:03,  5.43it/s]
    456/499      0.206G     0.02391    0.008056      0.02349          1         320:
57%|#####7    | 23/40 [00:04<00:03,  5.43it/s]
    456/499      0.206G     0.02391    0.008056      0.02349          1         320:
60%|######    | 24/40 [00:04<00:02,  5.40it/s]
    456/499      0.206G     0.02503    0.008097      0.02322          2         320:
60%|######    | 24/40 [00:04<00:02,  5.40it/s]
    456/499      0.206G     0.02503    0.008097      0.02322          2         320:
62%|######2   | 25/40 [00:04<00:02,  5.52it/s]
    456/499      0.206G     0.02492    0.008411      0.02329          4         320:
62%|######2   | 25/40 [00:04<00:02,  5.52it/s]
    456/499      0.206G     0.02492    0.008411      0.02329          4         320:
65%|######5   | 26/40 [00:04<00:02,  5.46it/s]
    456/499      0.206G     0.02488    0.008547      0.02327          3         320:
65%|######5   | 26/40 [00:04<00:02,  5.46it/s]
    456/499      0.206G     0.02488    0.008547      0.02327          3         320:
68%|######7   | 27/40 [00:04<00:02,  5.56it/s]
    456/499      0.206G     0.02451    0.008368      0.02319          1         320:
68%|######7   | 27/40 [00:05<00:02,  5.56it/s]
    456/499      0.206G     0.02451    0.008368      0.02319          1         320:
70%|#######   | 28/40 [00:05<00:02,  5.64it/s]
    456/499      0.206G     0.02417    0.008492      0.02313          4         320:
70%|#######   | 28/40 [00:05<00:02,  5.64it/s]
    456/499      0.206G     0.02417    0.008492      0.02313          4         320:
72%|#######2  | 29/40 [00:05<00:01,  5.67it/s]
    456/499      0.206G     0.02437    0.008442      0.02295          2         320:
72%|#######2  | 29/40 [00:05<00:01,  5.67it/s]
    456/499      0.206G     0.02437    0.008442      0.02295          2         320:
75%|#######5  | 30/40 [00:05<00:01,  5.56it/s]
```

```
    456/499      0.206G    0.02413   0.008403     0.0227        2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.56it/s]
    456/499      0.206G    0.02413   0.008403     0.0227        2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.64it/s]
    456/499      0.206G    0.02391   0.008606    0.02263        4        320:
78%|#######7  | 31/40 [00:05<00:01,  5.64it/s]
    456/499      0.206G    0.02391   0.008606    0.02263        4        320:
80%|########  | 32/40 [00:05<00:01,  5.52it/s]
    456/499      0.206G    0.02349   0.008497    0.02228        2        320:
80%|########  | 32/40 [00:05<00:01,  5.52it/s]
    456/499      0.206G    0.02349   0.008497    0.02228        2        320:
82%|########2 | 33/40 [00:05<00:01,  5.76it/s]
    456/499      0.206G    0.02314   0.008502    0.02208        4        320:
82%|########2 | 33/40 [00:06<00:01,  5.76it/s]
    456/499      0.206G    0.02314   0.008502    0.02208        4        320:
85%|########5 | 34/40 [00:06<00:01,  5.77it/s]
    456/499      0.206G    0.02342   0.008544    0.02192        2        320:
85%|########5 | 34/40 [00:06<00:01,  5.77it/s]
    456/499      0.206G    0.02342   0.008544    0.02192        2        320:
88%|########7 | 35/40 [00:06<00:00,  5.62it/s]
    456/499      0.206G    0.02311   0.008546    0.02175        2        320:
88%|########7 | 35/40 [00:06<00:00,  5.62it/s]
    456/499      0.206G    0.02311   0.008546    0.02175        2        320:
90%|######### | 36/40 [00:06<00:00,  5.68it/s]
    456/499      0.206G    0.02329   0.008503    0.02154        2        320:
90%|######### | 36/40 [00:06<00:00,  5.68it/s]
    456/499      0.206G    0.02329   0.008503    0.02154        2        320:
92%|#########2| 37/40 [00:06<00:00,  5.57it/s]
    456/499      0.206G    0.02295   0.008353    0.02165        1        320:
92%|#########2| 37/40 [00:06<00:00,  5.57it/s]
    456/499      0.206G    0.02295   0.008353    0.02165        1        320:
95%|#########5| 38/40 [00:06<00:00,  5.62it/s]
    456/499      0.206G    0.02355   0.008514    0.02169        4        320:
95%|#########5| 38/40 [00:06<00:00,  5.62it/s]
    456/499      0.206G    0.02355   0.008514    0.02169        4        320:
98%|#########7| 39/40 [00:06<00:00,  5.67it/s]
    456/499      0.206G    0.02338   0.008502    0.02166        2        320:
98%|#########7| 39/40 [00:07<00:00,  5.67it/s]
    456/499      0.206G    0.02338   0.008502    0.02166        2        320:
100%|##########| 40/40 [00:07<00:00,  5.29it/s]
    456/499      0.206G    0.02338   0.008502    0.02166        2        320:
100%|##########| 40/40 [00:07<00:00,  5.55it/s]

              Class     Images  Instances          P        R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances          P        R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 14.05it/s]
              Class     Images  Instances          P        R      mAP50
```

```
mAP50-95:  20%|##         | 4/20 [00:00<00:01, 15.09it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 14.71it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 15.19it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 13.63it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 13.33it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 14.08it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:01<00:00, 13.64it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 14.30it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.78it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.33it/s]
                 all        40         40      0.965      0.964      0.988
0.783

       Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
     457/499     0.206G   0.007889   0.002607     0.0124          1        320:
0%|           | 0/40 [00:00<?, ?it/s]
     457/499     0.206G   0.007889   0.002607     0.0124          1        320:
2%|2          | 1/40 [00:00<00:07,  5.33it/s]
     457/499     0.206G    0.01226   0.003487     0.0132          1        320:
2%|2          | 1/40 [00:00<00:07,  5.33it/s]
     457/499     0.206G    0.01226   0.003487     0.0132          1        320:
5%|5          | 2/40 [00:00<00:07,  5.18it/s]
     457/499     0.206G    0.01244    0.00423    0.01398          2        320:
5%|5          | 2/40 [00:00<00:07,  5.18it/s]
     457/499     0.206G    0.01244    0.00423    0.01398          2        320:
8%|7          | 3/40 [00:00<00:07,  5.16it/s]
     457/499     0.206G    0.01301   0.005037    0.01437          2        320:
8%|7          | 3/40 [00:00<00:07,  5.16it/s]
     457/499     0.206G    0.01301   0.005037    0.01437          2        320:
10%|#         | 4/40 [00:00<00:06,  5.23it/s]
     457/499     0.206G    0.01696   0.007175    0.01632          4        320:
10%|#         | 4/40 [00:00<00:06,  5.23it/s]
     457/499     0.206G    0.01696   0.007175    0.01632          4        320:
12%|#2        | 5/40 [00:00<00:06,  5.24it/s]
     457/499     0.206G    0.01576   0.006545    0.01636          1        320:
12%|#2        | 5/40 [00:01<00:06,  5.24it/s]
     457/499     0.206G    0.01576   0.006545    0.01636          1        320:
```

```
15%|#5          | 6/40 [00:01<00:06,  5.42it/s]
     457/499      0.206G     0.01628     0.00723     0.01653        4        320:
15%|#5          | 6/40 [00:01<00:06,  5.42it/s]
     457/499      0.206G     0.01628     0.00723     0.01653        4        320:
18%|#7          | 7/40 [00:01<00:06,  5.39it/s]
     457/499      0.206G     0.01548    0.006922     0.01681        1        320:
18%|#7          | 7/40 [00:01<00:06,  5.39it/s]
     457/499      0.206G     0.01548    0.006922     0.01681        1        320:
20%|##          | 8/40 [00:01<00:05,  5.36it/s]
     457/499      0.206G     0.01483     0.00672      0.0164        1        320:
20%|##          | 8/40 [00:01<00:05,  5.36it/s]
     457/499      0.206G     0.01483     0.00672      0.0164        1        320:
22%|##2         | 9/40 [00:01<00:05,  5.65it/s]
     457/499      0.206G     0.01411    0.006521     0.01594        1        320:
22%|##2         | 9/40 [00:01<00:05,  5.65it/s]
     457/499      0.206G     0.01411    0.006521     0.01594        1        320:
25%|##5         | 10/40 [00:01<00:05,  5.55it/s]
     457/499      0.206G     0.01476    0.007168     0.01662        4        320:
25%|##5         | 10/40 [00:02<00:05,  5.55it/s]
     457/499      0.206G     0.01476    0.007168     0.01662        4        320:
28%|##7         | 11/40 [00:02<00:05,  5.32it/s]
     457/499      0.206G      0.015     0.007354     0.01647        2        320:
28%|##7         | 11/40 [00:02<00:05,  5.32it/s]
     457/499      0.206G      0.015     0.007354     0.01647        2        320:
30%|###         | 12/40 [00:02<00:05,  5.46it/s]
     457/499      0.206G     0.01753     0.00748     0.01676        2        320:
30%|###         | 12/40 [00:02<00:05,  5.46it/s]
     457/499      0.206G     0.01753     0.00748     0.01676        2        320:
32%|###2        | 13/40 [00:02<00:04,  5.42it/s]
     457/499      0.206G     0.01721    0.007327     0.01651        1        320:
32%|###2        | 13/40 [00:02<00:04,  5.42it/s]
     457/499      0.206G     0.01721    0.007327     0.01651        1        320:
35%|###5        | 14/40 [00:02<00:04,  5.52it/s]
     457/499      0.206G     0.01654     0.00723     0.01666        1        320:
35%|###5        | 14/40 [00:02<00:04,  5.52it/s]
     457/499      0.206G     0.01654     0.00723     0.01666        1        320:
38%|###7        | 15/40 [00:02<00:04,  5.46it/s]
     457/499      0.206G     0.01879    0.007482     0.01693        4        320:
38%|###7        | 15/40 [00:02<00:04,  5.46it/s]
     457/499      0.206G     0.01879    0.007482     0.01693        4        320:
40%|####        | 16/40 [00:02<00:04,  5.42it/s]
     457/499      0.206G     0.01828    0.007457     0.01696        2        320:
40%|####        | 16/40 [00:03<00:04,  5.42it/s]
     457/499      0.206G     0.01828    0.007457     0.01696        2        320:
42%|####2       | 17/40 [00:03<00:04,  5.52it/s]
     457/499      0.206G     0.01826    0.007343     0.01678        1        320:
42%|####2       | 17/40 [00:03<00:04,  5.52it/s]
     457/499      0.206G     0.01826    0.007343     0.01678        1        320:
```

```
45%|####5      | 18/40 [00:03<00:03,  5.60it/s]
    457/499     0.206G      0.01775    0.007108    0.01684        1        320:
45%|####5      | 18/40 [00:03<00:03,  5.60it/s]
    457/499     0.206G      0.01775    0.007108    0.01684        1        320:
48%|####7      | 19/40 [00:03<00:03,  5.67it/s]
    457/499     0.206G      0.01784    0.006994    0.01685        2        320:
48%|####7      | 19/40 [00:03<00:03,  5.67it/s]
    457/499     0.206G      0.01784    0.006994    0.01685        2        320:
50%|#####      | 20/40 [00:03<00:03,  5.69it/s]
    457/499     0.206G      0.01795    0.007566    0.01713        4        320:
50%|#####      | 20/40 [00:03<00:03,  5.69it/s]
    457/499     0.206G      0.01795    0.007566    0.01713        4        320:
52%|#####2     | 21/40 [00:03<00:03,  5.58it/s]
    457/499     0.206G      0.01828    0.007533    0.01712        2        320:
52%|#####2     | 21/40 [00:03<00:03,  5.58it/s]
    457/499     0.206G      0.01828    0.007533    0.01712        2        320:
55%|#####5     | 22/40 [00:03<00:03,  5.80it/s]
    457/499     0.206G      0.01812    0.007664    0.01712        2        320:
55%|#####5     | 22/40 [00:04<00:03,  5.80it/s]
    457/499     0.206G      0.01812    0.007664    0.01712        2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.65it/s]
    457/499     0.206G      0.01823    0.008273    0.01713        4        320:
57%|#####7     | 23/40 [00:04<00:03,  5.65it/s]
    457/499     0.206G      0.01823    0.008273    0.01713        4        320:
60%|######     | 24/40 [00:04<00:02,  5.70it/s]
    457/499     0.206G      0.01845    0.008292    0.01734        3        320:
60%|######     | 24/40 [00:04<00:02,  5.70it/s]
    457/499     0.206G      0.01845    0.008292    0.01734        3        320:
62%|######2    | 25/40 [00:04<00:02,  5.73it/s]
    457/499     0.206G      0.01905    0.008342    0.01761        3        320:
62%|######2    | 25/40 [00:04<00:02,  5.73it/s]
    457/499     0.206G      0.01905    0.008342    0.01761        3        320:
65%|######5    | 26/40 [00:04<00:02,  5.59it/s]
    457/499     0.206G       0.0192    0.008564    0.01787        4        320:
65%|######5    | 26/40 [00:04<00:02,  5.59it/s]
    457/499     0.206G       0.0192    0.008564    0.01787        4        320:
68%|######7    | 27/40 [00:04<00:02,  5.51it/s]
    457/499     0.206G      0.01964    0.008923    0.01833        4        320:
68%|######7    | 27/40 [00:05<00:02,  5.51it/s]
    457/499     0.206G      0.01964    0.008923    0.01833        4        320:
70%|#######    | 28/40 [00:05<00:02,  5.29it/s]
    457/499     0.206G      0.02031    0.008857    0.01943        2        320:
70%|#######    | 28/40 [00:05<00:02,  5.29it/s]
    457/499     0.206G      0.02031    0.008857    0.01943        2        320:
72%|#######2   | 29/40 [00:05<00:02,  5.19it/s]
    457/499     0.206G      0.02056    0.008828     0.0202        2        320:
72%|#######2   | 29/40 [00:05<00:02,  5.19it/s]
    457/499     0.206G      0.02056    0.008828     0.0202        2        320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.36it/s]
    457/499      0.206G    0.02036   0.008689    0.02005        1        320:
75%|#######5  | 30/40 [00:05<00:01,  5.36it/s]
    457/499      0.206G    0.02036   0.008689    0.02005        1        320:
78%|#######7  | 31/40 [00:05<00:01,  5.39it/s]
    457/499      0.206G     0.0203   0.008562    0.02004        1        320:
78%|#######7  | 31/40 [00:05<00:01,  5.39it/s]
    457/499      0.206G     0.0203   0.008562    0.02004        1        320:
80%|########  | 32/40 [00:05<00:01,  5.59it/s]
    457/499      0.206G    0.02082   0.008495    0.01994        2        320:
80%|########  | 32/40 [00:06<00:01,  5.59it/s]
    457/499      0.206G    0.02082   0.008495    0.01994        2        320:
82%|########2 | 33/40 [00:06<00:01,  5.51it/s]
    457/499      0.206G     0.0217   0.008517    0.02011        2        320:
82%|########2 | 33/40 [00:06<00:01,  5.51it/s]
    457/499      0.206G     0.0217   0.008517    0.02011        2        320:
85%|########5 | 34/40 [00:06<00:01,  5.47it/s]
    457/499      0.206G    0.02132   0.008367     0.0199        1        320:
85%|########5 | 34/40 [00:06<00:01,  5.47it/s]
    457/499      0.206G    0.02132   0.008367     0.0199        1        320:
88%|########7 | 35/40 [00:06<00:00,  5.56it/s]
    457/499      0.206G    0.02119   0.008289    0.01971        2        320:
88%|########7 | 35/40 [00:06<00:00,  5.56it/s]
    457/499      0.206G    0.02119   0.008289    0.01971        2        320:
90%|######### | 36/40 [00:06<00:00,  5.79it/s]
    457/499      0.206G    0.02088    0.00814    0.01961        1        320:
90%|######### | 36/40 [00:06<00:00,  5.79it/s]
    457/499      0.206G    0.02088    0.00814    0.01961        1        320:
92%|#########2| 37/40 [00:06<00:00,  5.67it/s]
    457/499      0.206G    0.02082   0.008321    0.01958        4        320:
92%|#########2| 37/40 [00:06<00:00,  5.67it/s]
    457/499      0.206G    0.02082   0.008321    0.01958        4        320:
95%|#########5| 38/40 [00:06<00:00,  5.52it/s]
    457/499      0.206G    0.02096   0.008574    0.01952        4        320:
95%|#########5| 38/40 [00:07<00:00,  5.52it/s]
    457/499      0.206G    0.02096   0.008574    0.01952        4        320:
98%|#########7| 39/40 [00:07<00:00,  5.47it/s]
    457/499      0.206G    0.02097   0.008508    0.01942        2        320:
98%|#########7| 39/40 [00:07<00:00,  5.47it/s]
    457/499      0.206G    0.02097   0.008508    0.01942        2        320:
100%|##########| 40/40 [00:07<00:00,  5.40it/s]
    457/499      0.206G    0.02097   0.008508    0.01942        2        320:
100%|##########| 40/40 [00:07<00:00,  5.49it/s]

            Class      Images  Instances          P          R       mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
            Class      Images  Instances          P          R       mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:01, 16.00it/s]
```

```
              Class     Images  Instances        P          R      mAP50
mAP50-95:  20%|##        | 4/20 [00:00<00:00, 17.27it/s]
              Class     Images  Instances        P          R      mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 17.72it/s]
              Class     Images  Instances        P          R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 17.93it/s]
              Class     Images  Instances        P          R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 16.29it/s]
              Class     Images  Instances        P          R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 15.52it/s]
              Class     Images  Instances        P          R      mAP50
mAP50-95:  75%|#######5  | 15/20 [00:00<00:00, 16.89it/s]
              Class     Images  Instances        P          R      mAP50
mAP50-95:  85%|########5 | 17/20 [00:01<00:00, 16.49it/s]
              Class     Images  Instances        P          R      mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 15.80it/s]
              Class     Images  Instances        P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.56it/s]
                all        40         40      0.965      0.975      0.991
0.809

       Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

   0%|          | 0/40 [00:00<?, ?it/s]
     458/499    0.206G    0.02129    0.01477    0.01653          4        320:
0%|          | 0/40 [00:00<?, ?it/s]
     458/499    0.206G    0.02129    0.01477    0.01653          4        320:
2%|2         | 1/40 [00:00<00:06,  5.73it/s]
     458/499    0.206G    0.02126    0.00917    0.01528          1        320:
2%|2         | 1/40 [00:00<00:06,  5.73it/s]
     458/499    0.206G    0.02126    0.00917    0.01528          1        320:
5%|5         | 2/40 [00:00<00:06,  5.78it/s]
     458/499    0.206G    0.02035    0.01161    0.01571          4        320:
5%|5         | 2/40 [00:00<00:06,  5.78it/s]
     458/499    0.206G    0.02035    0.01161    0.01571          4        320:
8%|7         | 3/40 [00:00<00:06,  5.36it/s]
     458/499    0.206G    0.02109    0.01283    0.01717          4        320:
8%|7         | 3/40 [00:00<00:06,  5.36it/s]
     458/499    0.206G    0.02109    0.01283    0.01717          4        320:
10%|#         | 4/40 [00:00<00:06,  5.51it/s]
     458/499    0.206G    0.01875    0.01102    0.01636          1        320:
10%|#         | 4/40 [00:00<00:06,  5.51it/s]
     458/499    0.206G    0.01875    0.01102    0.01636          1        320:
12%|#2        | 5/40 [00:00<00:06,  5.62it/s]
     458/499    0.206G    0.01941   0.009805    0.01666          1        320:
12%|#2        | 5/40 [00:01<00:06,  5.62it/s]
     458/499    0.206G    0.01941   0.009805    0.01666          1        320:
15%|#5        | 6/40 [00:01<00:05,  5.69it/s]
```

```
     458/499      0.206G     0.01865     0.009246      0.01661          2          320:
15%|#5        | 6/40 [00:01<00:05,  5.69it/s]
     458/499      0.206G     0.01865     0.009246      0.01661          2          320:
18%|#7        | 7/40 [00:01<00:05,  5.88it/s]
     458/499      0.206G     0.01832     0.008567      0.01644          1          320:
18%|#7        | 7/40 [00:01<00:05,  5.88it/s]
     458/499      0.206G     0.01832     0.008567      0.01644          1          320:
20%|##        | 8/40 [00:01<00:05,  5.86it/s]
     458/499      0.206G     0.01705     0.007962      0.01616          1          320:
20%|##        | 8/40 [00:01<00:05,  5.86it/s]
     458/499      0.206G     0.01705     0.007962      0.01616          1          320:
22%|##2       | 9/40 [00:01<00:05,  6.02it/s]
     458/499      0.206G     0.01662     0.00777       0.01622          2          320:
22%|##2       | 9/40 [00:01<00:05,  6.02it/s]
     458/499      0.206G     0.01662     0.00777       0.01622          2          320:
25%|##5       | 10/40 [00:01<00:05,  5.93it/s]
     458/499      0.206G     0.01639     0.007558      0.01642          1          320:
25%|##5       | 10/40 [00:01<00:05,  5.93it/s]
     458/499      0.206G     0.01639     0.007558      0.01642          1          320:
28%|##7       | 11/40 [00:01<00:04,  5.90it/s]
     458/499      0.206G     0.01586     0.007206      0.01687          1          320:
28%|##7       | 11/40 [00:02<00:04,  5.90it/s]
     458/499      0.206G     0.01586     0.007206      0.01687          1          320:
30%|###       | 12/40 [00:02<00:04,  5.87it/s]
     458/499      0.206G     0.01599     0.006991      0.01637          1          320:
30%|###       | 12/40 [00:02<00:04,  5.87it/s]
     458/499      0.206G     0.01599     0.006991      0.01637          1          320:
32%|###2      | 13/40 [00:02<00:04,  5.82it/s]
     458/499      0.206G     0.01574     0.006791      0.01705          1          320:
32%|###2      | 13/40 [00:02<00:04,  5.82it/s]
     458/499      0.206G     0.01574     0.006791      0.01705          1          320:
35%|###5      | 14/40 [00:02<00:04,  5.82it/s]
     458/499      0.206G     0.01531     0.006537      0.01684          1          320:
35%|###5      | 14/40 [00:02<00:04,  5.82it/s]
     458/499      0.206G     0.01531     0.006537      0.01684          1          320:
38%|###7      | 15/40 [00:02<00:04,  5.98it/s]
     458/499      0.206G     0.01547     0.006591      0.01686          2          320:
38%|###7      | 15/40 [00:02<00:04,  5.98it/s]
     458/499      0.206G     0.01547     0.006591      0.01686          2          320:
40%|####      | 16/40 [00:02<00:04,  5.78it/s]
     458/499      0.206G     0.01764     0.006668      0.01695          2          320:
40%|####      | 16/40 [00:02<00:04,  5.78it/s]
     458/499      0.206G     0.01764     0.006668      0.01695          2          320:
42%|####2     | 17/40 [00:02<00:04,  5.64it/s]
     458/499      0.206G     0.0186      0.007202      0.01778          4          320:
42%|####2     | 17/40 [00:03<00:04,  5.64it/s]
     458/499      0.206G     0.0186      0.007202      0.01778          4          320:
45%|####5     | 18/40 [00:03<00:04,  5.38it/s]
```

```
     458/499      0.206G     0.01826     0.007145      0.01785           2           320:
45%|####5      | 18/40 [00:03<00:04,  5.38it/s]
     458/499      0.206G     0.01826     0.007145      0.01785           2           320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
     458/499      0.206G     0.01856     0.007495      0.01774           4           320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
     458/499      0.206G     0.01856     0.007495      0.01774           4           320:
50%|#####      | 20/40 [00:03<00:03,  5.32it/s]
     458/499      0.206G     0.01802     0.00728       0.01751           1           320:
50%|#####      | 20/40 [00:03<00:03,  5.32it/s]
     458/499      0.206G     0.01802     0.00728       0.01751           1           320:
52%|#####2     | 21/40 [00:03<00:03,  5.40it/s]
     458/499      0.206G     0.01758     0.007156      0.0173            1           320:
52%|#####2     | 21/40 [00:03<00:03,  5.40it/s]
     458/499      0.206G     0.01758     0.007156      0.0173            1           320:
55%|#####5     | 22/40 [00:03<00:03,  5.55it/s]
     458/499      0.206G     0.01749     0.00712       0.01742           2           320:
55%|#####5     | 22/40 [00:04<00:03,  5.55it/s]
     458/499      0.206G     0.01749     0.00712       0.01742           2           320:
57%|#####7     | 23/40 [00:04<00:03,  5.63it/s]
     458/499      0.206G     0.01837     0.007361      0.01746           4           320:
57%|#####7     | 23/40 [00:04<00:03,  5.63it/s]
     458/499      0.206G     0.01837     0.007361      0.01746           4           320:
60%|######     | 24/40 [00:04<00:02,  5.50it/s]
     458/499      0.206G     0.01872     0.007616      0.01774           4           320:
60%|######     | 24/40 [00:04<00:02,  5.50it/s]
     458/499      0.206G     0.01872     0.007616      0.01774           4           320:
62%|######2    | 25/40 [00:04<00:02,  5.62it/s]
     458/499      0.206G     0.01827     0.007411      0.01752           1           320:
62%|######2    | 25/40 [00:04<00:02,  5.62it/s]
     458/499      0.206G     0.01827     0.007411      0.01752           1           320:
65%|######5    | 26/40 [00:04<00:02,  5.53it/s]
     458/499      0.206G     0.01821     0.007398      0.01765           2           320:
65%|######5    | 26/40 [00:04<00:02,  5.53it/s]
     458/499      0.206G     0.01821     0.007398      0.01765           2           320:
68%|######7    | 27/40 [00:04<00:02,  5.56it/s]
     458/499      0.206G     0.01836     0.007564      0.01797           3           320:
68%|######7    | 27/40 [00:04<00:02,  5.56it/s]
     458/499      0.206G     0.01836     0.007564      0.01797           3           320:
70%|#######    | 28/40 [00:04<00:02,  5.39it/s]
     458/499      0.206G     0.01838     0.007823      0.01814           4           320:
70%|#######    | 28/40 [00:05<00:02,  5.39it/s]
     458/499      0.206G     0.01838     0.007823      0.01814           4           320:
72%|#######2   | 29/40 [00:05<00:02,  5.24it/s]
     458/499      0.206G     0.01904     0.007829      0.01813           2           320:
72%|#######2   | 29/40 [00:05<00:02,  5.24it/s]
     458/499      0.206G     0.01904     0.007829      0.01813           2           320:
75%|#######5   | 30/40 [00:05<00:01,  5.12it/s]
```

172

```
      458/499        0.206G      0.01902    0.008069       0.0181         4         320:
75%|#######5  | 30/40 [00:05<00:01,  5.12it/s]
      458/499        0.206G      0.01902    0.008069       0.0181         4         320:
78%|#######7  | 31/40 [00:05<00:01,  5.06it/s]
      458/499        0.206G      0.01895    0.008322      0.01813         4         320:
78%|#######7  | 31/40 [00:05<00:01,  5.06it/s]
      458/499        0.206G      0.01895    0.008322      0.01813         4         320:
80%|########  | 32/40 [00:05<00:01,  4.89it/s]
      458/499        0.206G      0.01913    0.008596      0.01836         4         320:
80%|########  | 32/40 [00:06<00:01,  4.89it/s]
      458/499        0.206G      0.01913    0.008596      0.01836         4         320:
82%|########2 | 33/40 [00:06<00:01,  4.80it/s]
      458/499        0.206G      0.01891    0.008537       0.0183         2         320:
82%|########2 | 33/40 [00:06<00:01,  4.80it/s]
      458/499        0.206G      0.01891    0.008537       0.0183         2         320:
85%|########5 | 34/40 [00:06<00:01,  4.95it/s]
      458/499        0.206G      0.01874    0.008497      0.01835         2         320:
85%|########5 | 34/40 [00:06<00:01,  4.95it/s]
      458/499        0.206G      0.01874    0.008497      0.01835         2         320:
88%|########7 | 35/40 [00:06<00:01,  4.92it/s]
      458/499        0.206G      0.01859    0.008378      0.01829         1         320:
88%|########7 | 35/40 [00:06<00:01,  4.92it/s]
      458/499        0.206G      0.01859    0.008378      0.01829         1         320:
90%|######### | 36/40 [00:06<00:00,  4.92it/s]
      458/499        0.206G      0.01903    0.008357      0.01822         2         320:
90%|######### | 36/40 [00:06<00:00,  4.92it/s]
      458/499        0.206G      0.01903    0.008357      0.01822         2         320:
92%|#########2| 37/40 [00:06<00:00,  4.79it/s]
      458/499        0.206G      0.01873    0.008197      0.01813         1         320:
92%|#########2| 37/40 [00:07<00:00,  4.79it/s]
      458/499        0.206G      0.01873    0.008197      0.01813         1         320:
95%|#########5| 38/40 [00:07<00:00,  4.95it/s]
      458/499        0.206G      0.01928     0.00816      0.01819         2         320:
95%|#########5| 38/40 [00:07<00:00,  4.95it/s]
      458/499        0.206G      0.01928     0.00816      0.01819         2         320:
98%|#########7| 39/40 [00:07<00:00,  4.83it/s]
      458/499        0.206G      0.01961    0.008128      0.01808         2         320:
98%|#########7| 39/40 [00:07<00:00,  4.83it/s]
      458/499        0.206G      0.01961    0.008128      0.01808         2         320:
100%|##########| 40/40 [00:07<00:00,  4.63it/s]
      458/499        0.206G      0.01961    0.008128      0.01808         2         320:
100%|##########| 40/40 [00:07<00:00,  5.35it/s]

               Class      Images  Instances           P         R       mAP50
mAP50-95:    0%|             | 0/20 [00:00<?, ?it/s]
               Class      Images  Instances           P         R       mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:00, 18.29it/s]
               Class      Images  Instances           P         R       mAP50
```

```
mAP50-95:  20%|##         | 4/20 [00:00<00:01, 15.65it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 15.81it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 15.78it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 15.18it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 15.44it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 15.59it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  80%|########   | 16/20 [00:01<00:00, 16.36it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 16.90it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.61it/s]
             Class      Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.16it/s]
               all         40         40      0.965      0.975      0.991
0.809

      Epoch    GPU_mem    box_loss    obj_loss    cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
    459/499     0.206G     0.02312     0.01527     0.03134          4       320:
0%|          | 0/40 [00:00<?, ?it/s]
    459/499     0.206G     0.02312     0.01527     0.03134          4       320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
    459/499     0.206G     0.04007      0.0108      0.0361          2       320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
    459/499     0.206G     0.04007      0.0108      0.0361          2       320:
5%|5         | 2/40 [00:00<00:06,  5.52it/s]
    459/499     0.206G     0.02946    0.009432     0.02818          2       320:
5%|5         | 2/40 [00:00<00:06,  5.52it/s]
    459/499     0.206G     0.02946    0.009432     0.02818          2       320:
8%|7         | 3/40 [00:00<00:06,  5.68it/s]
    459/499     0.206G     0.02462    0.008914     0.02575          2       320:
8%|7         | 3/40 [00:00<00:06,  5.68it/s]
    459/499     0.206G     0.02462    0.008914     0.02575          2       320:
10%|#         | 4/40 [00:00<00:06,  5.91it/s]
    459/499     0.206G     0.02668    0.008979     0.02426          3       320:
10%|#         | 4/40 [00:00<00:06,  5.91it/s]
    459/499     0.206G     0.02668    0.008979     0.02426          3       320:
12%|#2        | 5/40 [00:00<00:06,  5.69it/s]
    459/499     0.206G     0.02802     0.01003     0.02377          4       320:
12%|#2        | 5/40 [00:01<00:06,  5.69it/s]
    459/499     0.206G     0.02802     0.01003     0.02377          4       320:
```

174

```
15%|#5          | 6/40 [00:01<00:06,  5.54it/s]
    459/499    0.206G    0.02722    0.01232    0.02404        4        320:
15%|#5          | 6/40 [00:01<00:06,  5.54it/s]
    459/499    0.206G    0.02722    0.01232    0.02404        4        320:
18%|#7          | 7/40 [00:01<00:06,  5.47it/s]
    459/499    0.206G    0.03002    0.01179    0.02321        2        320:
18%|#7          | 7/40 [00:01<00:06,  5.47it/s]
    459/499    0.206G    0.03002    0.01179    0.02321        2        320:
20%|##          | 8/40 [00:01<00:05,  5.57it/s]
    459/499    0.206G    0.02889    0.01093    0.02207        1        320:
20%|##          | 8/40 [00:01<00:05,  5.57it/s]
    459/499    0.206G    0.02889    0.01093    0.02207        1        320:
22%|##2         | 9/40 [00:01<00:05,  5.65it/s]
    459/499    0.206G    0.02835    0.01141    0.02256        4        320:
22%|##2         | 9/40 [00:01<00:05,  5.65it/s]
    459/499    0.206G    0.02835    0.01141    0.02256        4        320:
25%|##5         | 10/40 [00:01<00:05,  5.55it/s]
    459/499    0.206G    0.03021    0.01103    0.02231        2        320:
25%|##5         | 10/40 [00:01<00:05,  5.55it/s]
    459/499    0.206G    0.03021    0.01103    0.02231        2        320:
28%|##7         | 11/40 [00:01<00:05,  5.48it/s]
    459/499    0.206G    0.02963    0.01116    0.02232        4        320:
28%|##7         | 11/40 [00:02<00:05,  5.48it/s]
    459/499    0.206G    0.02963    0.01116    0.02232        4        320:
30%|###         | 12/40 [00:02<00:05,  5.28it/s]
    459/499    0.206G    0.02902    0.0109     0.02245        3        320:
30%|###         | 12/40 [00:02<00:05,  5.28it/s]
    459/499    0.206G    0.02902    0.0109     0.02245        3        320:
32%|###2        | 13/40 [00:02<00:05,  5.17it/s]
    459/499    0.206G    0.0278     0.01079    0.02254        3        320:
32%|###2        | 13/40 [00:02<00:05,  5.17it/s]
    459/499    0.206G    0.0278     0.01079    0.02254        3        320:
35%|###5        | 14/40 [00:02<00:05,  5.09it/s]
    459/499    0.206G    0.02709    0.01041    0.02208        2        320:
35%|###5        | 14/40 [00:02<00:05,  5.09it/s]
    459/499    0.206G    0.02709    0.01041    0.02208        2        320:
38%|###7        | 15/40 [00:02<00:04,  5.27it/s]
    459/499    0.206G    0.02595    0.01018    0.02204        1        320:
38%|###7        | 15/40 [00:02<00:04,  5.27it/s]
    459/499    0.206G    0.02595    0.01018    0.02204        1        320:
40%|####        | 16/40 [00:02<00:04,  5.28it/s]
    459/499    0.206G    0.02529    0.01025    0.02181        4        320:
40%|####        | 16/40 [00:03<00:04,  5.28it/s]
    459/499    0.206G    0.02529    0.01025    0.02181        4        320:
42%|####2       | 17/40 [00:03<00:04,  5.28it/s]
    459/499    0.206G    0.02611    0.01002    0.02334        2        320:
42%|####2       | 17/40 [00:03<00:04,  5.28it/s]
    459/499    0.206G    0.02611    0.01002    0.02334        2        320:
```

```
45%|####5     | 18/40 [00:03<00:04,  5.30it/s]
     459/499      0.206G     0.02683    0.009851    0.02323         2        320:
45%|####5     | 18/40 [00:03<00:04,  5.30it/s]
     459/499      0.206G     0.02683    0.009851    0.02323         2        320:
48%|####7     | 19/40 [00:03<00:04,  5.18it/s]
     459/499      0.206G     0.02647    0.009652    0.02284         2        320:
48%|####7     | 19/40 [00:03<00:04,  5.18it/s]
     459/499      0.206G     0.02647    0.009652    0.02284         2        320:
50%|#####     | 20/40 [00:03<00:03,  5.22it/s]
     459/499      0.206G     0.02585    0.009499    0.02243         1        320:
50%|#####     | 20/40 [00:03<00:03,  5.22it/s]
     459/499      0.206G     0.02585    0.009499    0.02243         1        320:
52%|#####2    | 21/40 [00:03<00:03,  5.51it/s]
     459/499      0.206G     0.02537    0.009267    0.02219         1        320:
52%|#####2    | 21/40 [00:04<00:03,  5.51it/s]
     459/499      0.206G     0.02537    0.009267    0.02219         1        320:
55%|#####5    | 22/40 [00:04<00:03,  5.55it/s]
     459/499      0.206G      0.0252    0.009002    0.02157         1        320:
55%|#####5    | 22/40 [00:04<00:03,  5.55it/s]
     459/499      0.206G      0.0252    0.009002    0.02157         1        320:
57%|#####7    | 23/40 [00:04<00:02,  5.67it/s]
     459/499      0.206G     0.02575    0.009284    0.02156         2        320:
57%|#####7    | 23/40 [00:04<00:02,  5.67it/s]
     459/499      0.206G     0.02575    0.009284    0.02156         2        320:
60%|######    | 24/40 [00:04<00:02,  5.43it/s]
     459/499      0.206G     0.02631    0.009239    0.02139         2        320:
60%|######    | 24/40 [00:04<00:02,  5.43it/s]
     459/499      0.206G     0.02631    0.009239    0.02139         2        320:
62%|######2   | 25/40 [00:04<00:02,  5.50it/s]
     459/499      0.206G      0.0259    0.009004    0.02118         1        320:
62%|######2   | 25/40 [00:04<00:02,  5.50it/s]
     459/499      0.206G      0.0259    0.009004    0.02118         1        320:
65%|######5   | 26/40 [00:04<00:02,  5.47it/s]
     459/499      0.206G     0.02544    0.008856    0.02099         1        320:
65%|######5   | 26/40 [00:04<00:02,  5.47it/s]
     459/499      0.206G     0.02544    0.008856    0.02099         1        320:
68%|######7   | 27/40 [00:04<00:02,  5.57it/s]
     459/499      0.206G     0.02558    0.008811    0.02099         2        320:
68%|######7   | 27/40 [00:05<00:02,  5.57it/s]
     459/499      0.206G     0.02558    0.008811    0.02099         2        320:
70%|#######   | 28/40 [00:05<00:02,  5.64it/s]
     459/499      0.206G     0.02538    0.008821    0.02132         2        320:
70%|#######   | 28/40 [00:05<00:02,  5.64it/s]
     459/499      0.206G     0.02538    0.008821    0.02132         2        320:
72%|#######2  | 29/40 [00:05<00:01,  5.52it/s]
     459/499      0.206G     0.02543    0.008792    0.02216         2        320:
72%|#######2  | 29/40 [00:05<00:01,  5.52it/s]
     459/499      0.206G     0.02543    0.008792    0.02216         2        320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.46it/s]
      459/499    0.206G    0.02558    0.008704    0.02202         2       320:
75%|#######5  | 30/40 [00:05<00:01,  5.46it/s]
      459/499    0.206G    0.02558    0.008704    0.02202         2       320:
78%|#######7  | 31/40 [00:05<00:01,  5.42it/s]
      459/499    0.206G    0.02505    0.008582    0.02192         1       320:
78%|#######7  | 31/40 [00:05<00:01,  5.42it/s]
      459/499    0.206G    0.02505    0.008582    0.02192         1       320:
80%|########  | 32/40 [00:05<00:01,  5.52it/s]
      459/499    0.206G    0.02573    0.008637    0.02182         3       320:
80%|########  | 32/40 [00:06<00:01,  5.52it/s]
      459/499    0.206G    0.02573    0.008637    0.02182         3       320:
82%|########2 | 33/40 [00:06<00:01,  5.46it/s]
      459/499    0.206G    0.02518    0.008501    0.02168         1       320:
82%|########2 | 33/40 [00:06<00:01,  5.46it/s]
      459/499    0.206G    0.02518    0.008501    0.02168         1       320:
85%|########5 | 34/40 [00:06<00:01,  5.71it/s]
      459/499    0.206G    0.02498    0.008643    0.02145         2       320:
85%|########5 | 34/40 [00:06<00:01,  5.71it/s]
      459/499    0.206G    0.02498    0.008643    0.02145         2       320:
88%|########7 | 35/40 [00:06<00:00,  5.43it/s]
      459/499    0.206G    0.02465    0.008655    0.02128         2       320:
88%|########7 | 35/40 [00:06<00:00,  5.43it/s]
      459/499    0.206G    0.02465    0.008655    0.02128         2       320:
90%|######### | 36/40 [00:06<00:00,  5.40it/s]
      459/499    0.206G    0.02449    0.008775    0.02122         4       320:
90%|######### | 36/40 [00:06<00:00,  5.40it/s]
      459/499    0.206G    0.02449    0.008775    0.02122         4       320:
92%|#########2| 37/40 [00:06<00:00,  5.38it/s]
      459/499    0.206G    0.02421    0.008639    0.02113         2       320:
92%|#########2| 37/40 [00:06<00:00,  5.38it/s]
      459/499    0.206G    0.02421    0.008639    0.02113         2       320:
95%|#########5| 38/40 [00:06<00:00,  5.35it/s]
      459/499    0.206G    0.02415    0.008752    0.02096         4       320:
95%|#########5| 38/40 [00:07<00:00,  5.35it/s]
      459/499    0.206G    0.02415    0.008752    0.02096         4       320:
98%|#########7| 39/40 [00:07<00:00,  5.22it/s]
      459/499    0.206G    0.02455    0.008885    0.02087         4       320:
98%|#########7| 39/40 [00:07<00:00,  5.22it/s]
      459/499    0.206G    0.02455    0.008885    0.02087         4       320:
100%|##########| 40/40 [00:07<00:00,  5.25it/s]
      459/499    0.206G    0.02455    0.008885    0.02087         4       320:
100%|##########| 40/40 [00:07<00:00,  5.43it/s]

                Class     Images  Instances          P          R      mAP50
mAP50-95:    0%|              | 0/20 [00:00<?, ?it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:   10%|#             | 2/20 [00:00<00:01, 14.10it/s]
```

177

```
              Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:00, 16.29it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 14.48it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 13.97it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 15.55it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 16.39it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5    | 15/20 [00:00<00:00, 17.46it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  85%|########5   | 17/20 [00:01<00:00, 17.00it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.70it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.52it/s]
                all        40         40      0.971      0.974       0.99
0.816

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    460/499     0.206G    0.05064    0.01083    0.01588          2       320:
0%|           | 0/40 [00:00<?, ?it/s]
    460/499     0.206G    0.05064    0.01083    0.01588          2       320:
2%|2          | 1/40 [00:00<00:07,  5.31it/s]
    460/499     0.206G    0.03839    0.01159    0.01786          4       320:
2%|2          | 1/40 [00:00<00:07,  5.31it/s]
    460/499     0.206G    0.03839    0.01159    0.01786          4       320:
5%|5          | 2/40 [00:00<00:06,  5.60it/s]
    460/499     0.206G    0.03126    0.01176    0.01855          4       320:
5%|5          | 2/40 [00:00<00:06,  5.60it/s]
    460/499     0.206G    0.03126    0.01176    0.01855          4       320:
8%|7          | 3/40 [00:00<00:06,  5.70it/s]
    460/499     0.206G    0.02614    0.01003    0.01805          2       320:
8%|7          | 3/40 [00:00<00:06,  5.70it/s]
    460/499     0.206G    0.02614    0.01003    0.01805          2       320:
10%|#          | 4/40 [00:00<00:06,  5.72it/s]
    460/499     0.206G    0.02315   0.009248    0.01942          2       320:
10%|#          | 4/40 [00:00<00:06,  5.72it/s]
    460/499     0.206G    0.02315   0.009248    0.01942          2       320:
12%|#2         | 5/40 [00:00<00:06,  5.75it/s]
    460/499     0.206G    0.02717   0.008895    0.02184          2       320:
12%|#2         | 5/40 [00:01<00:06,  5.75it/s]
    460/499     0.206G    0.02717   0.008895    0.02184          2       320:
15%|#5         | 6/40 [00:01<00:05,  5.77it/s]
```

```
    460/499      0.206G     0.02514    0.008152      0.02085          1          320:
15%|#5         | 6/40 [00:01<00:05,  5.77it/s]
    460/499      0.206G     0.02514    0.008152      0.02085          1          320:
18%|#7         | 7/40 [00:01<00:05,  5.78it/s]
    460/499      0.206G     0.02354    0.007668      0.02009          1          320:
18%|#7         | 7/40 [00:01<00:05,  5.78it/s]
    460/499      0.206G     0.02354    0.007668      0.02009          1          320:
20%|##         | 8/40 [00:01<00:05,  5.79it/s]
    460/499      0.206G     0.02204    0.007186      0.01931          1          320:
20%|##         | 8/40 [00:01<00:05,  5.79it/s]
    460/499      0.206G     0.02204    0.007186      0.01931          1          320:
22%|##2        | 9/40 [00:01<00:05,  5.64it/s]
    460/499      0.206G     0.02382    0.007442      0.01917          3          320:
22%|##2        | 9/40 [00:01<00:05,  5.64it/s]
    460/499      0.206G     0.02382    0.007442      0.01917          3          320:
25%|##5        | 10/40 [00:01<00:05,  5.51it/s]
    460/499      0.206G     0.02279    0.007229      0.01924          1          320:
25%|##5        | 10/40 [00:01<00:05,  5.51it/s]
    460/499      0.206G     0.02279    0.007229      0.01924          1          320:
28%|##7        | 11/40 [00:01<00:05,  5.60it/s]
    460/499      0.206G     0.02224    0.007422       0.0191          4          320:
28%|##7        | 11/40 [00:02<00:05,  5.60it/s]
    460/499      0.206G     0.02224    0.007422       0.0191          4          320:
30%|###        | 12/40 [00:02<00:05,  5.52it/s]
    460/499      0.206G     0.02168    0.007708      0.01941          2          320:
30%|###        | 12/40 [00:02<00:05,  5.52it/s]
    460/499      0.206G     0.02168    0.007708      0.01941          2          320:
32%|###2       | 13/40 [00:02<00:04,  5.59it/s]
    460/499      0.206G     0.02405     0.00756      0.01938          2          320:
32%|###2       | 13/40 [00:02<00:04,  5.59it/s]
    460/499      0.206G     0.02405     0.00756      0.01938          2          320:
35%|###5       | 14/40 [00:02<00:04,  5.23it/s]
    460/499      0.206G     0.02411     0.00733       0.0191          1          320:
35%|###5       | 14/40 [00:02<00:04,  5.23it/s]
    460/499      0.206G     0.02411     0.00733       0.0191          1          320:
38%|###7       | 15/40 [00:02<00:04,  5.40it/s]
    460/499      0.206G     0.02305    0.007082      0.01859          1          320:
38%|###7       | 15/40 [00:02<00:04,  5.40it/s]
    460/499      0.206G     0.02305    0.007082      0.01859          1          320:
40%|####       | 16/40 [00:02<00:04,  5.51it/s]
    460/499      0.206G     0.02241    0.006879      0.01845          1          320:
40%|####       | 16/40 [00:03<00:04,  5.51it/s]
    460/499      0.206G     0.02241    0.006879      0.01845          1          320:
42%|####2      | 17/40 [00:03<00:04,  5.75it/s]
    460/499      0.206G     0.02219    0.007105      0.01842          2          320:
42%|####2      | 17/40 [00:03<00:04,  5.75it/s]
    460/499      0.206G     0.02219    0.007105      0.01842          2          320:
45%|####5      | 18/40 [00:03<00:03,  5.62it/s]
```

```
   460/499      0.206G    0.02298   0.007494    0.01868       4         320:
45%|####5     | 18/40 [00:03<00:03,  5.62it/s]
   460/499      0.206G    0.02298   0.007494    0.01868       4         320:
48%|####7     | 19/40 [00:03<00:03,  5.51it/s]
   460/499      0.206G    0.02294   0.007408    0.01873       1         320:
48%|####7     | 19/40 [00:03<00:03,  5.51it/s]
   460/499      0.206G    0.02294   0.007408    0.01873       1         320:
50%|#####     | 20/40 [00:03<00:03,  5.46it/s]
   460/499      0.206G    0.02217   0.007185     0.0185       1         320:
50%|#####     | 20/40 [00:03<00:03,  5.46it/s]
   460/499      0.206G    0.02217   0.007185     0.0185       1         320:
52%|#####2    | 21/40 [00:03<00:03,  5.16it/s]
   460/499      0.206G    0.02163   0.007036    0.01829       1         320:
52%|#####2    | 21/40 [00:03<00:03,  5.16it/s]
   460/499      0.206G    0.02163   0.007036    0.01829       1         320:
55%|#####5    | 22/40 [00:03<00:03,  5.20it/s]
   460/499      0.206G    0.02129    0.00705    0.01828       2         320:
55%|#####5    | 22/40 [00:04<00:03,  5.20it/s]
   460/499      0.206G    0.02129    0.00705    0.01828       2         320:
57%|#####7    | 23/40 [00:04<00:03,  4.99it/s]
   460/499      0.206G    0.02074   0.006987    0.01808       2         320:
57%|#####7    | 23/40 [00:04<00:03,  4.99it/s]
   460/499      0.206G    0.02074   0.006987    0.01808       2         320:
60%|######    | 24/40 [00:04<00:03,  5.08it/s]
   460/499      0.206G    0.02224   0.006947    0.01818       3         320:
60%|######    | 24/40 [00:04<00:03,  5.08it/s]
   460/499      0.206G    0.02224   0.006947    0.01818       3         320:
62%|######2   | 25/40 [00:04<00:02,  5.03it/s]
   460/499      0.206G    0.02294    0.00697    0.01884       2         320:
62%|######2   | 25/40 [00:04<00:02,  5.03it/s]
   460/499      0.206G    0.02294    0.00697    0.01884       2         320:
65%|######5   | 26/40 [00:04<00:02,  5.00it/s]
   460/499      0.206G    0.02311   0.007288    0.01902       4         320:
65%|######5   | 26/40 [00:05<00:02,  5.00it/s]
   460/499      0.206G    0.02311   0.007288    0.01902       4         320:
68%|######7   | 27/40 [00:05<00:02,  4.96it/s]
   460/499      0.206G    0.02293   0.007506    0.01914       4         320:
68%|######7   | 27/40 [00:05<00:02,  4.96it/s]
   460/499      0.206G    0.02293   0.007506    0.01914       4         320:
70%|#######   | 28/40 [00:05<00:02,  4.95it/s]
   460/499      0.206G    0.02309    0.00746    0.01905       2         320:
70%|#######   | 28/40 [00:05<00:02,  4.95it/s]
   460/499      0.206G    0.02309    0.00746    0.01905       2         320:
72%|#######2  | 29/40 [00:05<00:02,  4.81it/s]
   460/499      0.206G    0.02248   0.007311    0.01876       1         320:
72%|#######2  | 29/40 [00:05<00:02,  4.81it/s]
   460/499      0.206G    0.02248   0.007311    0.01876       1         320:
75%|#######5  | 30/40 [00:05<00:02,  4.96it/s]
```

```
     460/499      0.206G      0.02355    0.007379    0.01884         4          320:
75%|#######5  | 30/40 [00:05<00:02,  4.96it/s]
     460/499      0.206G      0.02355    0.007379    0.01884         4          320:
78%|#######7  | 31/40 [00:05<00:01,  4.83it/s]
     460/499      0.206G      0.02348    0.007215    0.01848         1          320:
78%|#######7  | 31/40 [00:06<00:01,  4.83it/s]
     460/499      0.206G      0.02348    0.007215    0.01848         1          320:
80%|########  | 32/40 [00:06<00:01,  5.08it/s]
     460/499      0.206G      0.02376    0.007148    0.01858         2          320:
80%|########  | 32/40 [00:06<00:01,  5.08it/s]
     460/499      0.206G      0.02376    0.007148    0.01858         2          320:
82%|########2 | 33/40 [00:06<00:01,  4.91it/s]
     460/499      0.206G      0.02339    0.007079    0.01849         1          320:
82%|########2 | 33/40 [00:06<00:01,  4.91it/s]
     460/499      0.206G      0.02339    0.007079    0.01849         1          320:
85%|########5 | 34/40 [00:06<00:01,  5.14it/s]
     460/499      0.206G      0.02355    0.007383    0.01859         4          320:
85%|########5 | 34/40 [00:06<00:01,  5.14it/s]
     460/499      0.206G      0.02355    0.007383    0.01859         4          320:
88%|########7 | 35/40 [00:06<00:00,  5.33it/s]
     460/499      0.206G      0.02366    0.007538    0.01855         4          320:
88%|########7 | 35/40 [00:06<00:00,  5.33it/s]
     460/499      0.206G      0.02366    0.007538    0.01855         4          320:
90%|######### | 36/40 [00:06<00:00,  4.96it/s]
     460/499      0.206G      0.02329    0.007459     0.0185         2          320:
90%|######### | 36/40 [00:06<00:00,  4.96it/s]
     460/499      0.206G      0.02329    0.007459     0.0185         2          320:
92%|#########2| 37/40 [00:06<00:00,  5.20it/s]
     460/499      0.206G      0.02334    0.007506    0.01903         2          320:
92%|#########2| 37/40 [00:07<00:00,  5.20it/s]
     460/499      0.206G      0.02334    0.007506    0.01903         2          320:
95%|#########5| 38/40 [00:07<00:00,  5.35it/s]
     460/499      0.206G      0.02307     0.00741    0.01912         1          320:
95%|#########5| 38/40 [00:07<00:00,  5.35it/s]
     460/499      0.206G      0.02307     0.00741    0.01912         1          320:
98%|#########7| 39/40 [00:07<00:00,  5.34it/s]
     460/499      0.206G      0.02374    0.007486    0.01908         2          320:
98%|#########7| 39/40 [00:07<00:00,  5.34it/s]
     460/499      0.206G      0.02374    0.007486    0.01908         2          320:
100%|##########| 40/40 [00:07<00:00,  5.46it/s]
     460/499      0.206G      0.02374    0.007486    0.01908         2          320:
100%|##########| 40/40 [00:07<00:00,  5.31it/s]

               Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:00, 18.28it/s]
               Class      Images  Instances          P          R      mAP50
```

```
mAP50-95:  20%|##        | 4/20 [00:00<00:00, 16.87it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 17.49it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 17.77it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 17.84it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 17.99it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 18.08it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|######### | 16/20 [00:00<00:00, 16.64it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.16it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.70it/s]
                all          40         40      0.965      0.965      0.992
0.812

       Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
     461/499     0.206G    0.01904   0.006946    0.01723          2       320:
0%|          | 0/40 [00:00<?, ?it/s]
     461/499     0.206G    0.01904   0.006946    0.01723          2       320:
2%|2         | 1/40 [00:00<00:06,  6.37it/s]
     461/499     0.206G    0.02368   0.009397    0.02054          3       320:
2%|2         | 1/40 [00:00<00:06,  6.37it/s]
     461/499     0.206G    0.02368   0.009397    0.02054          3       320:
5%|5         | 2/40 [00:00<00:06,  5.70it/s]
     461/499     0.206G    0.02584    0.00832    0.02087          1       320:
5%|5         | 2/40 [00:00<00:06,  5.70it/s]
     461/499     0.206G    0.02584    0.00832    0.02087          1       320:
8%|7         | 3/40 [00:00<00:06,  6.00it/s]
     461/499     0.206G      0.025   0.009368    0.02021          4       320:
8%|7         | 3/40 [00:00<00:06,  6.00it/s]
     461/499     0.206G      0.025   0.009368    0.02021          4       320:
10%|#         | 4/40 [00:00<00:06,  5.72it/s]
     461/499     0.206G    0.02193   0.008834    0.01953          2       320:
10%|#         | 4/40 [00:00<00:06,  5.72it/s]
     461/499     0.206G    0.02193   0.008834    0.01953          2       320:
12%|#2        | 5/40 [00:00<00:06,  5.57it/s]
     461/499     0.206G    0.02325    0.00857    0.01897          2       320:
12%|#2        | 5/40 [00:01<00:06,  5.57it/s]
     461/499     0.206G    0.02325    0.00857    0.01897          2       320:
15%|#5        | 6/40 [00:01<00:06,  5.65it/s]
     461/499     0.206G    0.02307   0.009299    0.01989          4       320:
```

```
15%|#5        | 6/40 [00:01<00:06,  5.65it/s]
     461/499    0.206G    0.02307   0.009299   0.01989        4        320:
18%|#7        | 7/40 [00:01<00:06,  5.49it/s]
     461/499    0.206G    0.02289    0.0101    0.01982        4        320:
18%|#7        | 7/40 [00:01<00:06,  5.49it/s]
     461/499    0.206G    0.02289    0.0101    0.01982        4        320:
20%|##        | 8/40 [00:01<00:05,  5.35it/s]
     461/499    0.206G    0.02087   0.009237   0.01916        1        320:
20%|##        | 8/40 [00:01<00:05,  5.35it/s]
     461/499    0.206G    0.02087   0.009237   0.01916        1        320:
22%|##2       | 9/40 [00:01<00:05,  5.41it/s]
     461/499    0.206G    0.01878   0.008429   0.01725        0        320:
22%|##2       | 9/40 [00:01<00:05,  5.41it/s]
     461/499    0.206G    0.01878   0.008429   0.01725        0        320:
25%|##5       | 10/40 [00:01<00:05,  5.72it/s]
     461/499    0.206G    0.01865   0.008713   0.01794        4        320:
25%|##5       | 10/40 [00:01<00:05,  5.72it/s]
     461/499    0.206G    0.01865   0.008713   0.01794        4        320:
28%|##7       | 11/40 [00:01<00:05,  5.31it/s]
     461/499    0.206G    0.02027   0.00867    0.01866        2        320:
28%|##7       | 11/40 [00:02<00:05,  5.31it/s]
     461/499    0.206G    0.02027   0.00867    0.01866        2        320:
30%|###       | 12/40 [00:02<00:05,  5.45it/s]
     461/499    0.206G    0.02226   0.008646   0.01871        2        320:
30%|###       | 12/40 [00:02<00:05,  5.45it/s]
     461/499    0.206G    0.02226   0.008646   0.01871        2        320:
32%|###2      | 13/40 [00:02<00:05,  5.39it/s]
     461/499    0.206G    0.02206   0.009257   0.01934        4        320:
32%|###2      | 13/40 [00:02<00:05,  5.39it/s]
     461/499    0.206G    0.02206   0.009257   0.01934        4        320:
35%|###5      | 14/40 [00:02<00:04,  5.24it/s]
     461/499    0.206G    0.02166   0.00902    0.01917        2        320:
35%|###5      | 14/40 [00:02<00:04,  5.24it/s]
     461/499    0.206G    0.02166   0.00902    0.01917        2        320:
38%|###7      | 15/40 [00:02<00:04,  5.29it/s]
     461/499    0.206G    0.02082   0.008602   0.01884        1        320:
38%|###7      | 15/40 [00:02<00:04,  5.29it/s]
     461/499    0.206G    0.02082   0.008602   0.01884        1        320:
40%|####      | 16/40 [00:02<00:04,  5.55it/s]
     461/499    0.206G    0.02305   0.008446   0.02047        2        320:
40%|####      | 16/40 [00:03<00:04,  5.55it/s]
     461/499    0.206G    0.02305   0.008446   0.02047        2        320:
42%|####2     | 17/40 [00:03<00:04,  5.62it/s]
     461/499    0.206G    0.02402   0.008779   0.02074        4        320:
42%|####2     | 17/40 [00:03<00:04,  5.62it/s]
     461/499    0.206G    0.02402   0.008779   0.02074        4        320:
45%|####5     | 18/40 [00:03<00:03,  5.54it/s]
     461/499    0.206G    0.02341   0.008513   0.02023        1        320:
```

```
45%|####5       | 18/40 [00:03<00:03,  5.54it/s]
    461/499      0.206G      0.02341     0.008513     0.02023          1          320:
48%|####7       | 19/40 [00:03<00:03,  5.75it/s]
    461/499      0.206G      0.02294     0.00854      0.01991          2          320:
48%|####7       | 19/40 [00:03<00:03,  5.75it/s]
    461/499      0.206G      0.02294     0.00854      0.01991          2          320:
50%|#####       | 20/40 [00:03<00:03,  5.93it/s]
    461/499      0.206G      0.02227     0.00827      0.01968          1          320:
50%|#####       | 20/40 [00:03<00:03,  5.93it/s]
    461/499      0.206G      0.02227     0.00827      0.01968          1          320:
52%|#####2      | 21/40 [00:03<00:03,  5.90it/s]
    461/499      0.206G      0.02211     0.008515     0.0196           4          320:
52%|#####2      | 21/40 [00:03<00:03,  5.90it/s]
    461/499      0.206G      0.02211     0.008515     0.0196           4          320:
55%|#####5      | 22/40 [00:03<00:03,  5.86it/s]
    461/499      0.206G      0.02167     0.008418     0.01945          1          320:
55%|#####5      | 22/40 [00:04<00:03,  5.86it/s]
    461/499      0.206G      0.02167     0.008418     0.01945          1          320:
57%|#####7      | 23/40 [00:04<00:02,  5.85it/s]
    461/499      0.206G      0.02115     0.008202     0.01925          1          320:
57%|#####7      | 23/40 [00:04<00:02,  5.85it/s]
    461/499      0.206G      0.02115     0.008202     0.01925          1          320:
60%|######      | 24/40 [00:04<00:02,  5.84it/s]
    461/499      0.206G      0.02126     0.00851      0.01933          4          320:
60%|######      | 24/40 [00:04<00:02,  5.84it/s]
    461/499      0.206G      0.02126     0.00851      0.01933          4          320:
62%|######2     | 25/40 [00:04<00:02,  5.81it/s]
    461/499      0.206G      0.02232     0.008428     0.01925          2          320:
62%|######2     | 25/40 [00:04<00:02,  5.81it/s]
    461/499      0.206G      0.02232     0.008428     0.01925          2          320:
65%|######5     | 26/40 [00:04<00:02,  5.81it/s]
    461/499      0.206G      0.02218     0.008444     0.0193           2          320:
65%|######5     | 26/40 [00:04<00:02,  5.81it/s]
    461/499      0.206G      0.02218     0.008444     0.0193           2          320:
68%|######7     | 27/40 [00:04<00:02,  5.81it/s]
    461/499      0.206G      0.02192     0.008306     0.01918          1          320:
68%|######7     | 27/40 [00:04<00:02,  5.81it/s]
    461/499      0.206G      0.02192     0.008306     0.01918          1          320:
70%|#######     | 28/40 [00:04<00:02,  5.80it/s]
    461/499      0.206G      0.02179     0.008352     0.01896          2          320:
70%|#######     | 28/40 [00:05<00:02,  5.80it/s]
    461/499      0.206G      0.02179     0.008352     0.01896          2          320:
72%|#######2    | 29/40 [00:05<00:01,  5.80it/s]
    461/499      0.206G      0.02147     0.008349     0.019            2          320:
72%|#######2    | 29/40 [00:05<00:01,  5.80it/s]
    461/499      0.206G      0.02147     0.008349     0.019            2          320:
75%|#######5    | 30/40 [00:05<00:01,  5.81it/s]
    461/499      0.206G      0.02209     0.008852     0.01934          2          320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.81it/s]
    461/499      0.206G    0.02209    0.008852    0.01934          2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.65it/s]
    461/499      0.206G    0.02306    0.008766    0.01994          2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.65it/s]
    461/499      0.206G    0.02306    0.008766    0.01994          2        320:
80%|########  | 32/40 [00:05<00:01,  5.55it/s]
    461/499      0.206G    0.02259    0.008621    0.01972          1        320:
80%|########  | 32/40 [00:05<00:01,  5.55it/s]
    461/499      0.206G    0.02259    0.008621    0.01972          1        320:
82%|########2 | 33/40 [00:05<00:01,  5.48it/s]
    461/499      0.206G    0.02233    0.008506    0.01959          1        320:
82%|########2 | 33/40 [00:06<00:01,  5.48it/s]
    461/499      0.206G    0.02233    0.008506    0.01959          1        320:
85%|########5 | 34/40 [00:06<00:01,  5.45it/s]
    461/499      0.206G    0.02193    0.008414    0.01941          1        320:
85%|########5 | 34/40 [00:06<00:01,  5.45it/s]
    461/499      0.206G    0.02193    0.008414    0.01941          1        320:
88%|########7 | 35/40 [00:06<00:00,  5.66it/s]
    461/499      0.206G    0.02191    0.008554    0.01962          4        320:
88%|########7 | 35/40 [00:06<00:00,  5.66it/s]
    461/499      0.206G    0.02191    0.008554    0.01962          4        320:
90%|######### | 36/40 [00:06<00:00,  5.27it/s]
    461/499      0.206G    0.02166    0.008427    0.01955          1        320:
90%|######### | 36/40 [00:06<00:00,  5.27it/s]
    461/499      0.206G    0.02166    0.008427    0.01955          1        320:
92%|#########2| 37/40 [00:06<00:00,  5.42it/s]
    461/499      0.206G    0.02167    0.008433    0.01942          2        320:
92%|#########2| 37/40 [00:06<00:00,  5.42it/s]
    461/499      0.206G    0.02167    0.008433    0.01942          2        320:
95%|#########5| 38/40 [00:06<00:00,  5.54it/s]
    461/499      0.206G    0.02129    0.008312    0.01931          1        320:
95%|#########5| 38/40 [00:06<00:00,  5.54it/s]
    461/499      0.206G    0.02129    0.008312    0.01931          1        320:
98%|#########7| 39/40 [00:06<00:00,  5.62it/s]
    461/499      0.206G    0.02156    0.008457    0.01938          4        320:
98%|#########7| 39/40 [00:07<00:00,  5.62it/s]
    461/499      0.206G    0.02156    0.008457    0.01938          4        320:
100%|##########| 40/40 [00:07<00:00,  5.66it/s]
    461/499      0.206G    0.02156    0.008457    0.01938          4        320:
100%|##########| 40/40 [00:07<00:00,  5.62it/s]


              Class     Images  Instances          P          R      mAP50
mAP50-95:    0%|             | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:01, 16.61it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:   20%|##         | 4/20 [00:00<00:00, 17.55it/s]
```

```
              Class     Images  Instances         P         R     mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 15.46it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 16.74it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  55%|#####5       | 11/20 [00:00<00:00, 17.79it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  65%|######5      | 13/20 [00:00<00:00, 17.93it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  80%|########     | 16/20 [00:00<00:00, 18.08it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 18.43it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 18.38it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.80it/s]
                all        40        40     0.965     0.965     0.992
0.812

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances      Size

  0%|             | 0/40 [00:00<?, ?it/s]
    462/499     0.206G    0.01307   0.004323   0.005545          1      320:
0%|             | 0/40 [00:00<?, ?it/s]
    462/499     0.206G    0.01307   0.004323   0.005545          1      320:
2%|2           | 1/40 [00:00<00:05,  7.11it/s]
    462/499     0.206G     0.0337   0.005434    0.01369          2      320:
2%|2           | 1/40 [00:00<00:05,  7.11it/s]
    462/499     0.206G     0.0337   0.005434    0.01369          2      320:
5%|5           | 2/40 [00:00<00:06,  6.27it/s]
    462/499     0.206G    0.03408   0.005627    0.01387          2      320:
5%|5           | 2/40 [00:00<00:06,  6.27it/s]
    462/499     0.206G    0.03408   0.005627    0.01387          2      320:
8%|7           | 3/40 [00:00<00:06,  5.83it/s]
    462/499     0.206G    0.02745   0.005426    0.01493          1      320:
8%|7           | 3/40 [00:00<00:06,  5.83it/s]
    462/499     0.206G    0.02745   0.005426    0.01493          1      320:
10%|#           | 4/40 [00:00<00:06,  5.79it/s]
    462/499     0.206G    0.02795   0.006413    0.01886          2      320:
10%|#           | 4/40 [00:00<00:06,  5.79it/s]
    462/499     0.206G    0.02795   0.006413    0.01886          2      320:
12%|#2          | 5/40 [00:00<00:06,  5.80it/s]
    462/499     0.206G    0.02792    0.00745    0.01956          4      320:
12%|#2          | 5/40 [00:01<00:06,  5.80it/s]
    462/499     0.206G    0.02792    0.00745    0.01956          4      320:
15%|#5          | 6/40 [00:01<00:06,  5.45it/s]
    462/499     0.206G    0.02779   0.007526    0.02224          2      320:
15%|#5          | 6/40 [00:01<00:06,  5.45it/s]
```

```
    462/499     0.206G    0.02779    0.007526    0.02224         2         320:
18%|#7         | 7/40 [00:01<00:06,  5.41it/s]
    462/499     0.206G    0.02922    0.008761     0.0221         4         320:
18%|#7         | 7/40 [00:01<00:06,  5.41it/s]
    462/499     0.206G    0.02922    0.008761     0.0221         4         320:
20%|##         | 8/40 [00:01<00:05,  5.38it/s]
    462/499     0.206G    0.02728    0.008467    0.02197         2         320:
20%|##         | 8/40 [00:01<00:05,  5.38it/s]
    462/499     0.206G    0.02728    0.008467    0.02197         2         320:
22%|##2        | 9/40 [00:01<00:05,  5.51it/s]
    462/499     0.206G    0.02525    0.008049    0.02108         1         320:
22%|##2        | 9/40 [00:01<00:05,  5.51it/s]
    462/499     0.206G    0.02525    0.008049    0.02108         1         320:
25%|##5        | 10/40 [00:01<00:05,  5.31it/s]
    462/499     0.206G     0.0235    0.007583    0.02029         1         320:
25%|##5        | 10/40 [00:01<00:05,  5.31it/s]
    462/499     0.206G     0.0235    0.007583    0.02029         1         320:
28%|##7        | 11/40 [00:01<00:05,  5.32it/s]
    462/499     0.206G    0.02477    0.007432     0.0198         2         320:
28%|##7        | 11/40 [00:02<00:05,  5.32it/s]
    462/499     0.206G    0.02477    0.007432     0.0198         2         320:
30%|###        | 12/40 [00:02<00:05,  5.06it/s]
    462/499     0.206G    0.02347    0.007083    0.01949         1         320:
30%|###        | 12/40 [00:02<00:05,  5.06it/s]
    462/499     0.206G    0.02347    0.007083    0.01949         1         320:
32%|###2       | 13/40 [00:02<00:05,  5.02it/s]
    462/499     0.206G    0.02318    0.006884    0.01914         1         320:
32%|###2       | 13/40 [00:02<00:05,  5.02it/s]
    462/499     0.206G    0.02318    0.006884    0.01914         1         320:
35%|###5       | 14/40 [00:02<00:05,  4.98it/s]
    462/499     0.206G    0.02315    0.006841     0.0188         2         320:
35%|###5       | 14/40 [00:02<00:05,  4.98it/s]
    462/499     0.206G    0.02315    0.006841     0.0188         2         320:
38%|###7       | 15/40 [00:02<00:05,  4.94it/s]
    462/499     0.206G    0.02262    0.006713    0.01906         1         320:
38%|###7       | 15/40 [00:03<00:05,  4.94it/s]
    462/499     0.206G    0.02262    0.006713    0.01906         1         320:
40%|####       | 16/40 [00:03<00:04,  5.06it/s]
    462/499     0.206G    0.02219    0.006683    0.01888         2         320:
40%|####       | 16/40 [00:03<00:04,  5.06it/s]
    462/499     0.206G    0.02219    0.006683    0.01888         2         320:
42%|####2      | 17/40 [00:03<00:04,  4.99it/s]
    462/499     0.206G    0.02338    0.007063    0.01893         3         320:
42%|####2      | 17/40 [00:03<00:04,  4.99it/s]
    462/499     0.206G    0.02338    0.007063    0.01893         3         320:
45%|####5      | 18/40 [00:03<00:04,  4.86it/s]
    462/499     0.206G    0.02262    0.007059    0.01873         2         320:
45%|####5      | 18/40 [00:03<00:04,  4.86it/s]
```

```
      462/499      0.206G     0.02262   0.007059      0.01873            2         320:
48%|####7      | 19/40 [00:03<00:04,  4.99it/s]
      462/499      0.206G     0.02299   0.007186      0.01906            3         320:
48%|####7      | 19/40 [00:03<00:04,  4.99it/s]
      462/499      0.206G     0.02299   0.007186      0.01906            3         320:
50%|#####      | 20/40 [00:03<00:04,  4.74it/s]
      462/499      0.206G     0.02389    0.00758       0.019            4         320:
50%|#####      | 20/40 [00:04<00:04,  4.74it/s]
      462/499      0.206G     0.02389    0.00758       0.019            4         320:
52%|#####2     | 21/40 [00:04<00:03,  4.79it/s]
      462/499      0.206G      0.0234   0.007533      0.01876            1         320:
52%|#####2     | 21/40 [00:04<00:03,  4.79it/s]
      462/499      0.206G      0.0234   0.007533      0.01876            1         320:
55%|#####5     | 22/40 [00:04<00:03,  4.84it/s]
      462/499      0.206G     0.02428   0.007679      0.01927            4         320:
55%|#####5     | 22/40 [00:04<00:03,  4.84it/s]
      462/499      0.206G     0.02428   0.007679      0.01927            4         320:
57%|#####7     | 23/40 [00:04<00:03,  4.86it/s]
      462/499      0.206G     0.02385   0.007492      0.01903            1         320:
57%|#####7     | 23/40 [00:04<00:03,  4.86it/s]
      462/499      0.206G     0.02385   0.007492      0.01903            1         320:
60%|######     | 24/40 [00:04<00:03,  5.11it/s]
      462/499      0.206G     0.02359   0.007639      0.01902            4         320:
60%|######     | 24/40 [00:04<00:03,  5.11it/s]
      462/499      0.206G     0.02359   0.007639      0.01902            4         320:
62%|######2    | 25/40 [00:04<00:02,  5.16it/s]
      462/499      0.206G     0.02336   0.007819      0.01928            4         320:
62%|######2    | 25/40 [00:05<00:02,  5.16it/s]
      462/499      0.206G     0.02336   0.007819      0.01928            4         320:
65%|######5    | 26/40 [00:05<00:02,  5.21it/s]
      462/499      0.206G     0.02299   0.008178      0.01963            4         320:
65%|######5    | 26/40 [00:05<00:02,  5.21it/s]
      462/499      0.206G     0.02299   0.008178      0.01963            4         320:
68%|######7    | 27/40 [00:05<00:02,  5.25it/s]
      462/499      0.206G     0.02235   0.007971      0.01938            1         320:
68%|######7    | 27/40 [00:05<00:02,  5.25it/s]
      462/499      0.206G     0.02235   0.007971      0.01938            1         320:
70%|#######    | 28/40 [00:05<00:02,  5.38it/s]
      462/499      0.206G     0.02213   0.007945      0.01922            2         320:
70%|#######    | 28/40 [00:05<00:02,  5.38it/s]
      462/499      0.206G     0.02213   0.007945      0.01922            2         320:
72%|#######2   | 29/40 [00:05<00:02,  5.36it/s]
      462/499      0.206G     0.02175   0.007902      0.01909            2         320:
72%|#######2   | 29/40 [00:05<00:02,  5.36it/s]
      462/499      0.206G     0.02175   0.007902      0.01909            2         320:
75%|#######5   | 30/40 [00:05<00:01,  5.50it/s]
      462/499      0.206G     0.02137   0.007738      0.01905            1         320:
75%|#######5   | 30/40 [00:05<00:01,  5.50it/s]
```

```
    462/499      0.206G     0.02137    0.007738    0.01905           1          320:
78%|#######7  | 31/40 [00:05<00:01,  5.56it/s]
    462/499      0.206G     0.02163     0.00798    0.01944           4          320:
78%|#######7  | 31/40 [00:06<00:01,  5.56it/s]
    462/499      0.206G     0.02163     0.00798    0.01944           4          320:
80%|########  | 32/40 [00:06<00:01,  5.64it/s]
    462/499      0.206G     0.02133    0.007859    0.01931           1          320:
80%|########  | 32/40 [00:06<00:01,  5.64it/s]
    462/499      0.206G     0.02133    0.007859    0.01931           1          320:
82%|########2 | 33/40 [00:06<00:01,  5.54it/s]
    462/499      0.206G     0.02175    0.008077     0.0194           4          320:
82%|########2 | 33/40 [00:06<00:01,  5.54it/s]
    462/499      0.206G     0.02175    0.008077     0.0194           4          320:
85%|########5 | 34/40 [00:06<00:01,  5.47it/s]
    462/499      0.206G     0.02202    0.008196    0.01969           4          320:
85%|########5 | 34/40 [00:06<00:01,  5.47it/s]
    462/499      0.206G     0.02202    0.008196    0.01969           4          320:
88%|########7 | 35/40 [00:06<00:00,  5.43it/s]
    462/499      0.206G     0.02254    0.008199    0.01961           2          320:
88%|########7 | 35/40 [00:06<00:00,  5.43it/s]
    462/499      0.206G     0.02254    0.008199    0.01961           2          320:
90%|######### | 36/40 [00:06<00:00,  5.54it/s]
    462/499      0.206G      0.0222    0.008177    0.01966           2          320:
90%|######### | 36/40 [00:07<00:00,  5.54it/s]
    462/499      0.206G      0.0222    0.008177    0.01966           2          320:
92%|#########2| 37/40 [00:07<00:00,  5.46it/s]
    462/499      0.206G     0.02197    0.008181     0.0197           2          320:
92%|#########2| 37/40 [00:07<00:00,  5.46it/s]
    462/499      0.206G     0.02197    0.008181     0.0197           2          320:
95%|#########5| 38/40 [00:07<00:00,  5.71it/s]
    462/499      0.206G     0.02181    0.008415    0.01957           4          320:
95%|#########5| 38/40 [00:07<00:00,  5.71it/s]
    462/499      0.206G     0.02181    0.008415    0.01957           4          320:
98%|#########7| 39/40 [00:07<00:00,  5.56it/s]
    462/499      0.206G     0.02232     0.00843    0.01962           2          320:
98%|#########7| 39/40 [00:07<00:00,  5.56it/s]
    462/499      0.206G     0.02232     0.00843    0.01962           2          320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]
    462/499      0.206G     0.02232     0.00843    0.01962           2          320:
100%|##########| 40/40 [00:07<00:00,  5.30it/s]


             Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
             Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:01, 16.00it/s]
             Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:01, 14.90it/s]
             Class     Images  Instances          P          R      mAP50
```

```
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 16.11it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 16.07it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 16.04it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 16.74it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 17.21it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########  | 16/20 [00:00<00:00, 17.39it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 16.93it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.33it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.76it/s]
                all         40         40       0.97      0.975      0.993
0.806

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
    463/499     0.206G    0.02072     0.0107    0.02019          4       320:
0%|          | 0/40 [00:00<?, ?it/s]
    463/499     0.206G    0.02072     0.0107    0.02019          4       320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
    463/499     0.206G      0.038    0.01055    0.02269          3       320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
    463/499     0.206G      0.038    0.01055    0.02269          3       320:
5%|5         | 2/40 [00:00<00:06,  5.52it/s]
    463/499     0.206G    0.03704    0.01163    0.02127          3       320:
5%|5         | 2/40 [00:00<00:06,  5.52it/s]
    463/499     0.206G    0.03704    0.01163    0.02127          3       320:
8%|7         | 3/40 [00:00<00:06,  5.41it/s]
    463/499     0.206G    0.02977   0.009661    0.01983          1       320:
8%|7         | 3/40 [00:00<00:06,  5.41it/s]
    463/499     0.206G    0.02977   0.009661    0.01983          1       320:
10%|#         | 4/40 [00:00<00:06,  5.56it/s]
    463/499     0.206G    0.02714   0.008514    0.01924          1       320:
10%|#         | 4/40 [00:00<00:06,  5.56it/s]
    463/499     0.206G    0.02714   0.008514    0.01924          1       320:
12%|#2        | 5/40 [00:00<00:06,  5.47it/s]
    463/499     0.206G    0.02663   0.009711    0.02006          4       320:
12%|#2        | 5/40 [00:01<00:06,  5.47it/s]
    463/499     0.206G    0.02663   0.009711    0.02006          4       320:
15%|#5        | 6/40 [00:01<00:06,  5.58it/s]
    463/499     0.206G    0.02586   0.008937    0.01917          1       320:
```

```
15%|#5          | 6/40 [00:01<00:06,  5.58it/s]
    463/499    0.206G    0.02586   0.008937   0.01917        1        320:
18%|#7          | 7/40 [00:01<00:06,  5.50it/s]
    463/499    0.206G    0.0249    0.009773   0.01913        4        320:
18%|#7          | 7/40 [00:01<00:06,  5.50it/s]
    463/499    0.206G    0.0249    0.009773   0.01913        4        320:
20%|##          | 8/40 [00:01<00:05,  5.60it/s]
    463/499    0.206G    0.02455   0.01062    0.01927        4        320:
20%|##          | 8/40 [00:01<00:05,  5.60it/s]
    463/499    0.206G    0.02455   0.01062    0.01927        4        320:
22%|##2         | 9/40 [00:01<00:05,  5.64it/s]
    463/499    0.206G    0.02749   0.009849   0.01916        2        320:
22%|##2         | 9/40 [00:01<00:05,  5.64it/s]
    463/499    0.206G    0.02749   0.009849   0.01916        2        320:
25%|##5         | 10/40 [00:01<00:05,  5.54it/s]
    463/499    0.206G    0.02563   0.009301   0.01942        1        320:
25%|##5         | 10/40 [00:01<00:05,  5.54it/s]
    463/499    0.206G    0.02563   0.009301   0.01942        1        320:
28%|##7         | 11/40 [00:01<00:05,  5.62it/s]
    463/499    0.206G    0.02444   0.009452    0.019         2        320:
28%|##7         | 11/40 [00:02<00:05,  5.62it/s]
    463/499    0.206G    0.02444   0.009452    0.019         2        320:
30%|###         | 12/40 [00:02<00:04,  5.66it/s]
    463/499    0.206G    0.02331   0.008986   0.01838        1        320:
30%|###         | 12/40 [00:02<00:04,  5.66it/s]
    463/499    0.206G    0.02331   0.008986   0.01838        1        320:
32%|###2        | 13/40 [00:02<00:04,  5.71it/s]
    463/499    0.206G    0.02334   0.009217   0.01897        4        320:
32%|###2        | 13/40 [00:02<00:04,  5.71it/s]
    463/499    0.206G    0.02334   0.009217   0.01897        4        320:
35%|###5        | 14/40 [00:02<00:04,  5.59it/s]
    463/499    0.206G    0.02356   0.00952    0.0192         4        320:
35%|###5        | 14/40 [00:02<00:04,  5.59it/s]
    463/499    0.206G    0.02356   0.00952    0.0192         4        320:
38%|###7        | 15/40 [00:02<00:04,  5.64it/s]
    463/499    0.206G    0.02278   0.009391   0.01893        2        320:
38%|###7        | 15/40 [00:02<00:04,  5.64it/s]
    463/499    0.206G    0.02278   0.009391   0.01893        2        320:
40%|####        | 16/40 [00:02<00:04,  5.85it/s]
    463/499    0.206G    0.02207   0.009185   0.01861        1        320:
40%|####        | 16/40 [00:03<00:04,  5.85it/s]
    463/499    0.206G    0.02207   0.009185   0.01861        1        320:
42%|####2       | 17/40 [00:03<00:03,  5.84it/s]
    463/499    0.206G    0.0215    0.009012   0.01824        2        320:
42%|####2       | 17/40 [00:03<00:03,  5.84it/s]
    463/499    0.206G    0.0215    0.009012   0.01824        2        320:
45%|####5       | 18/40 [00:03<00:03,  5.82it/s]
    463/499    0.206G    0.02087   0.008825   0.01796        1        320:
```

```
45%|####5        | 18/40 [00:03<00:03,  5.82it/s]
     463/499      0.206G    0.02087   0.008825    0.01796          1        320:
48%|####7        | 19/40 [00:03<00:03,  5.82it/s]
     463/499      0.206G    0.02094   0.009007    0.01921          2        320:
48%|####7        | 19/40 [00:03<00:03,  5.82it/s]
     463/499      0.206G    0.02094   0.009007    0.01921          2        320:
50%|#####        | 20/40 [00:03<00:03,  5.52it/s]
     463/499      0.206G    0.02039   0.008807    0.01896          1        320:
50%|#####        | 20/40 [00:03<00:03,  5.52it/s]
     463/499      0.206G    0.02039   0.008807    0.01896          1        320:
52%|#####2       | 21/40 [00:03<00:03,  5.60it/s]
     463/499      0.206G    0.01989   0.008537    0.01879          1        320:
52%|#####2       | 21/40 [00:03<00:03,  5.60it/s]
     463/499      0.206G    0.01989   0.008537    0.01879          1        320:
55%|#####5       | 22/40 [00:03<00:03,  5.66it/s]
     463/499      0.206G    0.01959   0.008403    0.01858          2        320:
55%|#####5       | 22/40 [00:04<00:03,  5.66it/s]
     463/499      0.206G    0.01959   0.008403    0.01858          2        320:
57%|#####7       | 23/40 [00:04<00:02,  5.71it/s]
     463/499      0.206G    0.01938   0.008214    0.01865          1        320:
57%|#####7       | 23/40 [00:04<00:02,  5.71it/s]
     463/499      0.206G    0.01938   0.008214    0.01865          1        320:
60%|######       | 24/40 [00:04<00:02,  5.71it/s]
     463/499      0.206G    0.01908   0.008081    0.01843          1        320:
60%|######       | 24/40 [00:04<00:02,  5.71it/s]
     463/499      0.206G    0.01908   0.008081    0.01843          1        320:
62%|######2      | 25/40 [00:04<00:02,  5.74it/s]
     463/499      0.206G     0.0202   0.008036    0.01881          2        320:
62%|######2      | 25/40 [00:04<00:02,  5.74it/s]
     463/499      0.206G     0.0202   0.008036    0.01881          2        320:
65%|######5      | 26/40 [00:04<00:02,  5.61it/s]
     463/499      0.206G    0.01982   0.007957     0.0186          1        320:
65%|######5      | 26/40 [00:04<00:02,  5.61it/s]
     463/499      0.206G    0.01982   0.007957     0.0186          1        320:
68%|######7      | 27/40 [00:04<00:02,  5.66it/s]
     463/499      0.206G    0.01948   0.007785    0.01846          1        320:
68%|######7      | 27/40 [00:04<00:02,  5.66it/s]
     463/499      0.206G    0.01948   0.007785    0.01846          1        320:
70%|#######      | 28/40 [00:04<00:02,  5.70it/s]
     463/499      0.206G    0.01915   0.007617    0.01851          1        320:
70%|#######      | 28/40 [00:05<00:02,  5.70it/s]
     463/499      0.206G    0.01915   0.007617    0.01851          1        320:
72%|#######2     | 29/40 [00:05<00:01,  5.59it/s]
     463/499      0.206G    0.01892   0.007457    0.01866          1        320:
72%|#######2     | 29/40 [00:05<00:01,  5.59it/s]
     463/499      0.206G    0.01892   0.007457    0.01866          1        320:
75%|#######5     | 30/40 [00:05<00:01,  5.48it/s]
     463/499      0.206G    0.01854   0.007313    0.01841          1        320:
```

```
75%|#######5   | 30/40 [00:05<00:01,  5.48it/s]
     463/499      0.206G     0.01854     0.007313     0.01841          1          320:
78%|#######7   | 31/40 [00:05<00:01,  5.58it/s]
     463/499      0.206G     0.01818     0.007164     0.01831          1          320:
78%|#######7   | 31/40 [00:05<00:01,  5.58it/s]
     463/499      0.206G     0.01818     0.007164     0.01831          1          320:
80%|########   | 32/40 [00:05<00:01,  5.50it/s]
     463/499      0.206G     0.01802     0.007128     0.01825          2          320:
80%|########   | 32/40 [00:05<00:01,  5.50it/s]
     463/499      0.206G     0.01802     0.007128     0.01825          2          320:
82%|########2  | 33/40 [00:05<00:01,  5.58it/s]
     463/499      0.206G     0.01793     0.007335     0.01847          2          320:
82%|########2  | 33/40 [00:06<00:01,  5.58it/s]
     463/499      0.206G     0.01793     0.007335     0.01847          2          320:
85%|########5  | 34/40 [00:06<00:01,  5.50it/s]
     463/499      0.206G     0.01808     0.007417     0.01848          2          320:
85%|########5  | 34/40 [00:06<00:01,  5.50it/s]
     463/499      0.206G     0.01808     0.007417     0.01848          2          320:
88%|########7  | 35/40 [00:06<00:00,  5.43it/s]
     463/499      0.206G     0.01788     0.007295     0.01831          1          320:
88%|########7  | 35/40 [00:06<00:00,  5.43it/s]
     463/499      0.206G     0.01788     0.007295     0.01831          1          320:
90%|######### | 36/40 [00:06<00:00,  5.56it/s]
     463/499      0.206G     0.01796     0.007654     0.01826          4          320:
90%|######### | 36/40 [00:06<00:00,  5.56it/s]
     463/499      0.206G     0.01796     0.007654     0.01826          4          320:
92%|#########2| 37/40 [00:06<00:00,  5.49it/s]
     463/499      0.206G     0.01845     0.007699     0.01848          2          320:
92%|#########2| 37/40 [00:06<00:00,  5.49it/s]
     463/499      0.206G     0.01845     0.007699     0.01848          2          320:
95%|#########5| 38/40 [00:06<00:00,  5.23it/s]
     463/499      0.206G     0.01828      0.0076     0.01849          1          320:
95%|#########5| 38/40 [00:06<00:00,  5.23it/s]
     463/499      0.206G     0.01828      0.0076     0.01849          1          320:
98%|#########7| 39/40 [00:06<00:00,  5.43it/s]
     463/499      0.206G     0.01839     0.007727     0.01862          4          320:
98%|#########7| 39/40 [00:07<00:00,  5.43it/s]
     463/499      0.206G     0.01839     0.007727     0.01862          4          320:
100%|##########| 40/40 [00:07<00:00,  5.53it/s]
     463/499      0.206G     0.01839     0.007727     0.01862          4          320:
100%|##########| 40/40 [00:07<00:00,  5.59it/s]


             Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
             Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 15.96it/s]
             Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 16.19it/s]
```

```
              Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 16.10it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 16.90it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 17.37it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 17.48it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 17.79it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:00<00:00, 17.95it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.29it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.87it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.06it/s]
                all         40         40       0.97      0.975      0.993
0.806

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    464/499     0.206G    0.01415   0.007788    0.01084          1       320:
0%|           | 0/40 [00:00<?, ?it/s]
    464/499     0.206G    0.01415   0.007788    0.01084          1       320:
2%|2          | 1/40 [00:00<00:07,  5.33it/s]
    464/499     0.206G    0.01472   0.008611    0.01987          4       320:
2%|2          | 1/40 [00:00<00:07,  5.33it/s]
    464/499     0.206G    0.01472   0.008611    0.01987          4       320:
5%|5          | 2/40 [00:00<00:07,  5.08it/s]
    464/499     0.206G    0.01274   0.006612    0.01753          1       320:
5%|5          | 2/40 [00:00<00:07,  5.08it/s]
    464/499     0.206G    0.01274   0.006612    0.01753          1       320:
8%|7          | 3/40 [00:00<00:07,  5.01it/s]
    464/499     0.206G    0.01407   0.009222    0.01745          4       320:
8%|7          | 3/40 [00:00<00:07,  5.01it/s]
    464/499     0.206G    0.01407   0.009222    0.01745          4       320:
10%|#          | 4/40 [00:00<00:08,  4.29it/s]
    464/499     0.206G    0.01481    0.01037    0.01758          4       320:
10%|#          | 4/40 [00:01<00:08,  4.29it/s]
    464/499     0.206G    0.01481    0.01037    0.01758          4       320:
12%|#2         | 5/40 [00:01<00:07,  4.50it/s]
    464/499     0.206G    0.01378     0.0101    0.01702          4       320:
12%|#2         | 5/40 [00:01<00:07,  4.50it/s]
    464/499     0.206G    0.01378     0.0101    0.01702          4       320:
15%|#5         | 6/40 [00:01<00:07,  4.73it/s]
```

```
    464/499      0.206G      0.01618      0.009719      0.01665          2          320:
15%|#5          | 6/40 [00:01<00:07,  4.73it/s]
    464/499      0.206G      0.01618      0.009719      0.01665          2          320:
18%|#7          | 7/40 [00:01<00:07,  4.69it/s]
    464/499      0.206G      0.01699      0.009805      0.01847          2          320:
18%|#7          | 7/40 [00:01<00:07,  4.69it/s]
    464/499      0.206G      0.01699      0.009805      0.01847          2          320:
20%|##          | 8/40 [00:01<00:06,  4.65it/s]
    464/499      0.206G      0.01708      0.01004      0.01825          4          320:
20%|##          | 8/40 [00:01<00:06,  4.65it/s]
    464/499      0.206G      0.01708      0.01004      0.01825          4          320:
22%|##2         | 9/40 [00:01<00:06,  4.57it/s]
    464/499      0.206G       0.0166      0.009296      0.01841          1          320:
22%|##2         | 9/40 [00:02<00:06,  4.57it/s]
    464/499      0.206G       0.0166      0.009296      0.01841          1          320:
25%|##5         | 10/40 [00:02<00:06,  4.82it/s]
    464/499      0.206G      0.01641      0.009096      0.01811          2          320:
25%|##5         | 10/40 [00:02<00:06,  4.82it/s]
    464/499      0.206G      0.01641      0.009096      0.01811          2          320:
28%|##7         | 11/40 [00:02<00:05,  4.85it/s]
    464/499      0.206G      0.01616      0.008886       0.0181          2          320:
28%|##7         | 11/40 [00:02<00:05,  4.85it/s]
    464/499      0.206G      0.01616      0.008886       0.0181          2          320:
30%|###         | 12/40 [00:02<00:05,  4.86it/s]
    464/499      0.206G      0.01843      0.009059      0.01862          2          320:
30%|###         | 12/40 [00:02<00:05,  4.86it/s]
    464/499      0.206G      0.01843      0.009059      0.01862          2          320:
32%|###2        | 13/40 [00:02<00:05,  4.88it/s]
    464/499      0.206G       0.0187      0.009506      0.01855          4          320:
32%|###2        | 13/40 [00:02<00:05,  4.88it/s]
    464/499      0.206G       0.0187      0.009506      0.01855          4          320:
35%|###5        | 14/40 [00:02<00:05,  5.01it/s]
    464/499      0.206G      0.02051      0.009243      0.01877          2          320:
35%|###5        | 14/40 [00:03<00:05,  5.01it/s]
    464/499      0.206G      0.02051      0.009243      0.01877          2          320:
38%|###7        | 15/40 [00:03<00:05,  4.98it/s]
    464/499      0.206G      0.01997      0.00927      0.01846          3          320:
38%|###7        | 15/40 [00:03<00:05,  4.98it/s]
    464/499      0.206G      0.01997      0.00927      0.01846          3          320:
40%|####        | 16/40 [00:03<00:04,  5.21it/s]
    464/499      0.206G      0.02001      0.009297      0.01838          2          320:
40%|####        | 16/40 [00:03<00:04,  5.21it/s]
    464/499      0.206G      0.02001      0.009297      0.01838          2          320:
42%|####2       | 17/40 [00:03<00:04,  5.10it/s]
    464/499      0.206G       0.0195      0.009073      0.01818          2          320:
42%|####2       | 17/40 [00:03<00:04,  5.10it/s]
    464/499      0.206G       0.0195      0.009073      0.01818          2          320:
45%|####5       | 18/40 [00:03<00:04,  5.29it/s]
```

```
     464/499      0.206G     0.01902    0.008949    0.01794        2        320:
45%|####5     | 18/40 [00:03<00:04,  5.29it/s]
     464/499      0.206G     0.01902    0.008949    0.01794        2        320:
48%|####7     | 19/40 [00:03<00:03,  5.44it/s]
     464/499      0.206G     0.02012    0.008918    0.01781        2        320:
48%|####7     | 19/40 [00:04<00:03,  5.44it/s]
     464/499      0.206G     0.02012    0.008918    0.01781        2        320:
50%|#####     | 20/40 [00:04<00:03,  5.52it/s]
     464/499      0.206G     0.01987    0.008773    0.01758        2        320:
50%|#####     | 20/40 [00:04<00:03,  5.52it/s]
     464/499      0.206G     0.01987    0.008773    0.01758        2        320:
52%|#####2    | 21/40 [00:04<00:03,  5.47it/s]
     464/499      0.206G     0.01952    0.008535    0.01785        1        320:
52%|#####2    | 21/40 [00:04<00:03,  5.47it/s]
     464/499      0.206G     0.01952    0.008535    0.01785        1        320:
55%|#####5    | 22/40 [00:04<00:03,  5.42it/s]
     464/499      0.206G     0.01898    0.008376    0.01766        1        320:
55%|#####5    | 22/40 [00:04<00:03,  5.42it/s]
     464/499      0.206G     0.01898    0.008376    0.01766        1        320:
57%|#####7    | 23/40 [00:04<00:03,  5.53it/s]
     464/499      0.206G     0.02004    0.008485    0.01778        3        320:
57%|#####7    | 23/40 [00:04<00:03,  5.53it/s]
     464/499      0.206G     0.02004    0.008485    0.01778        3        320:
60%|######    | 24/40 [00:04<00:03,  5.33it/s]
     464/499      0.206G     0.01976    0.008493    0.01795        2        320:
60%|######    | 24/40 [00:04<00:03,  5.33it/s]
     464/499      0.206G     0.01976    0.008493    0.01795        2        320:
62%|######2   | 25/40 [00:04<00:02,  5.61it/s]
     464/499      0.206G     0.02005    0.008448     0.0178        2        320:
62%|######2   | 25/40 [00:05<00:02,  5.61it/s]
     464/499      0.206G     0.02005    0.008448     0.0178        2        320:
65%|######5   | 26/40 [00:05<00:02,  5.50it/s]
     464/499      0.206G     0.01998    0.008387    0.01787        1        320:
65%|######5   | 26/40 [00:05<00:02,  5.50it/s]
     464/499      0.206G     0.01998    0.008387    0.01787        1        320:
68%|######7   | 27/40 [00:05<00:02,  5.59it/s]
     464/499      0.206G     0.02116    0.008462    0.01792        2        320:
68%|######7   | 27/40 [00:05<00:02,  5.59it/s]
     464/499      0.206G     0.02116    0.008462    0.01792        2        320:
70%|#######   | 28/40 [00:05<00:02,  5.37it/s]
     464/499      0.206G     0.02127    0.008533    0.01811        3        320:
70%|#######   | 28/40 [00:05<00:02,  5.37it/s]
     464/499      0.206G     0.02127    0.008533    0.01811        3        320:
72%|#######2  | 29/40 [00:05<00:02,  5.49it/s]
     464/499      0.206G     0.02188    0.008528     0.0182        2        320:
72%|#######2  | 29/40 [00:05<00:02,  5.49it/s]
     464/499      0.206G     0.02188    0.008528     0.0182        2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.44it/s]
```

```
    464/499      0.206G     0.02184    0.00875    0.01813         4        320:
75%|#######5  | 30/40 [00:06<00:01,  5.44it/s]
    464/499      0.206G     0.02184    0.00875    0.01813         4        320:
78%|#######7  | 31/40 [00:06<00:01,  5.55it/s]
    464/499      0.206G     0.02155    0.00857    0.01791         1        320:
78%|#######7  | 31/40 [00:06<00:01,  5.55it/s]
    464/499      0.206G     0.02155    0.00857    0.01791         1        320:
80%|########  | 32/40 [00:06<00:01,  5.76it/s]
    464/499      0.206G     0.02213    0.008601   0.01819         2        320:
80%|########  | 32/40 [00:06<00:01,  5.76it/s]
    464/499      0.206G     0.02213    0.008601   0.01819         2        320:
82%|########2 | 33/40 [00:06<00:01,  5.78it/s]
    464/499      0.206G     0.02209    0.008767   0.01845         4        320:
82%|########2 | 33/40 [00:06<00:01,  5.78it/s]
    464/499      0.206G     0.02209    0.008767   0.01845         4        320:
85%|########5 | 34/40 [00:06<00:01,  5.49it/s]
    464/499      0.206G     0.02186    0.008678   0.01839         2        320:
85%|########5 | 34/40 [00:06<00:01,  5.49it/s]
    464/499      0.206G     0.02186    0.008678   0.01839         2        320:
88%|########7 | 35/40 [00:06<00:00,  5.71it/s]
    464/499      0.206G     0.02145    0.008605   0.01826         2        320:
88%|########7 | 35/40 [00:06<00:00,  5.71it/s]
    464/499      0.206G     0.02145    0.008605   0.01826         2        320:
90%|######### | 36/40 [00:06<00:00,  5.74it/s]
    464/499      0.206G     0.02136    0.008582   0.01812         2        320:
90%|######### | 36/40 [00:07<00:00,  5.74it/s]
    464/499      0.206G     0.02136    0.008582   0.01812         2        320:
92%|#########2| 37/40 [00:07<00:00,  5.76it/s]
    464/499      0.206G     0.02098    0.00843    0.01811         1        320:
92%|#########2| 37/40 [00:07<00:00,  5.76it/s]
    464/499      0.206G     0.02098    0.00843    0.01811         1        320:
95%|#########5| 38/40 [00:07<00:00,  5.77it/s]
    464/499      0.206G     0.02113    0.008669   0.01824         4        320:
95%|#########5| 38/40 [00:07<00:00,  5.77it/s]
    464/499      0.206G     0.02113    0.008669   0.01824         4        320:
98%|#########7| 39/40 [00:07<00:00,  5.49it/s]
    464/499      0.206G     0.02122    0.008845   0.01834         4        320:
98%|#########7| 39/40 [00:07<00:00,  5.49it/s]
    464/499      0.206G     0.02122    0.008845   0.01834         4        320:
100%|##########| 40/40 [00:07<00:00,  5.44it/s]
    464/499      0.206G     0.02122    0.008845   0.01834         4        320:
100%|##########| 40/40 [00:07<00:00,  5.25it/s]


              Class       Images  Instances           P         R      mAP50
mAP50-95:    0%|            | 0/20 [00:00<?, ?it/s]
              Class       Images  Instances           P         R      mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:01, 15.75it/s]
              Class       Images  Instances           P         R      mAP50
```

```
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 17.15it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 17.65it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 17.87it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 17.83it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 17.32it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 16.17it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 16.79it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 17.55it/s]
               Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.22it/s]
                 all          40         40      0.976      0.975      0.994
0.814

       Epoch     GPU_mem    box_loss    obj_loss    cls_loss   Instances        Size

   0%|           | 0/40 [00:00<?, ?it/s]
     465/499     0.206G     0.02392     0.01594     0.03253           4        320:
 0%|           | 0/40 [00:00<?, ?it/s]
     465/499     0.206G     0.02392     0.01594     0.03253           4        320:
 2%|2          | 1/40 [00:00<00:06,  5.82it/s]
     465/499     0.206G     0.02636     0.01227     0.02829           4        320:
 2%|2          | 1/40 [00:00<00:06,  5.82it/s]
     465/499     0.206G     0.02636     0.01227     0.02829           4        320:
 5%|5          | 2/40 [00:00<00:06,  5.82it/s]
     465/499     0.206G     0.02162     0.01105     0.02659           2        320:
 5%|5          | 2/40 [00:00<00:06,  5.82it/s]
     465/499     0.206G     0.02162     0.01105     0.02659           2        320:
 8%|7          | 3/40 [00:00<00:06,  5.82it/s]
     465/499     0.206G     0.01834     0.009466    0.02331           1        320:
 8%|7          | 3/40 [00:00<00:06,  5.82it/s]
     465/499     0.206G     0.01834     0.009466    0.02331           1        320:
10%|#          | 4/40 [00:00<00:06,  5.80it/s]
     465/499     0.206G     0.01605     0.008286    0.02115           1        320:
10%|#          | 4/40 [00:00<00:06,  5.80it/s]
     465/499     0.206G     0.01605     0.008286    0.02115           1        320:
12%|#2         | 5/40 [00:00<00:06,  5.62it/s]
     465/499     0.206G     0.01686     0.009178     0.0207           4        320:
12%|#2         | 5/40 [00:01<00:06,  5.62it/s]
     465/499     0.206G     0.01686     0.009178     0.0207           4        320:
15%|#5         | 6/40 [00:01<00:05,  5.69it/s]
     465/499     0.206G     0.01652     0.00883     0.02002           1        320:
```

198

```
15%|#5           | 6/40 [00:01<00:05,  5.69it/s]
    465/499    0.206G    0.01652    0.00883    0.02002         1         320:
18%|#7           | 7/40 [00:01<00:05,  5.71it/s]
    465/499    0.206G    0.01671    0.008844   0.02047         4         320:
18%|#7           | 7/40 [00:01<00:05,  5.71it/s]
    465/499    0.206G    0.01671    0.008844   0.02047         4         320:
20%|##           | 8/40 [00:01<00:05,  5.43it/s]
    465/499    0.206G    0.01914    0.008948   0.02004         2         320:
20%|##           | 8/40 [00:01<00:05,  5.43it/s]
    465/499    0.206G    0.01914    0.008948   0.02004         2         320:
22%|##2          | 9/40 [00:01<00:05,  5.47it/s]
    465/499    0.206G    0.02114    0.009301   0.01989         4         320:
22%|##2          | 9/40 [00:01<00:05,  5.47it/s]
    465/499    0.206G    0.02114    0.009301   0.01989         4         320:
25%|##5          | 10/40 [00:01<00:05,  5.49it/s]
    465/499    0.206G    0.02103    0.008911   0.01927         1         320:
25%|##5          | 10/40 [00:01<00:05,  5.49it/s]
    465/499    0.206G    0.02103    0.008911   0.01927         1         320:
28%|##7          | 11/40 [00:01<00:05,  5.59it/s]
    465/499    0.206G    0.02076    0.009142   0.01966         4         320:
28%|##7          | 11/40 [00:02<00:05,  5.59it/s]
    465/499    0.206G    0.02076    0.009142   0.01966         4         320:
30%|###          | 12/40 [00:02<00:05,  5.53it/s]
    465/499    0.206G    0.01986    0.009287   0.01955         2         320:
30%|###          | 12/40 [00:02<00:05,  5.53it/s]
    465/499    0.206G    0.01986    0.009287   0.01955         2         320:
32%|###2         | 13/40 [00:02<00:04,  5.71it/s]
    465/499    0.206G    0.02179    0.009976   0.02003         4         320:
32%|###2         | 13/40 [00:02<00:04,  5.71it/s]
    465/499    0.206G    0.02179    0.009976   0.02003         4         320:
35%|###5         | 14/40 [00:02<00:04,  5.74it/s]
    465/499    0.206G    0.02097    0.009579   0.01955         1         320:
35%|###5         | 14/40 [00:02<00:04,  5.74it/s]
    465/499    0.206G    0.02097    0.009579   0.01955         1         320:
38%|###7         | 15/40 [00:02<00:04,  5.73it/s]
    465/499    0.206G    0.02083    0.009354   0.01971         2         320:
38%|###7         | 15/40 [00:02<00:04,  5.73it/s]
    465/499    0.206G    0.02083    0.009354   0.01971         2         320:
40%|####         | 16/40 [00:02<00:04,  5.63it/s]
    465/499    0.206G    0.02048    0.009175   0.01944         1         320:
40%|####         | 16/40 [00:03<00:04,  5.63it/s]
    465/499    0.206G    0.02048    0.009175   0.01944         1         320:
42%|####2        | 17/40 [00:03<00:04,  5.68it/s]
    465/499    0.206G       0.02    0.008873   0.01935         1         320:
42%|####2        | 17/40 [00:03<00:04,  5.68it/s]
    465/499    0.206G       0.02    0.008873   0.01935         1         320:
45%|####5        | 18/40 [00:03<00:03,  5.70it/s]
    465/499    0.206G     0.0202    0.009223   0.01929         4         320:
```

```
45%|####5       | 18/40 [00:03<00:03,  5.70it/s]
    465/499      0.206G      0.0202    0.009223     0.01929          4          320:
48%|####7       | 19/40 [00:03<00:03,  5.44it/s]
    465/499      0.206G     0.02032    0.009352     0.01949          4          320:
48%|####7       | 19/40 [00:03<00:03,  5.44it/s]
    465/499      0.206G     0.02032    0.009352     0.01949          4          320:
50%|#####       | 20/40 [00:03<00:03,  5.40it/s]
    465/499      0.206G     0.01992    0.009133     0.01898          2          320:
50%|#####       | 20/40 [00:03<00:03,  5.40it/s]
    465/499      0.206G     0.01992    0.009133     0.01898          2          320:
52%|#####2      | 21/40 [00:03<00:03,  5.58it/s]
    465/499      0.206G      0.0207    0.009092     0.01892          2          320:
52%|#####2      | 21/40 [00:03<00:03,  5.58it/s]
    465/499      0.206G      0.0207    0.009092     0.01892          2          320:
55%|#####5      | 22/40 [00:03<00:03,  5.58it/s]
    465/499      0.206G     0.02032    0.008826     0.01877          1          320:
55%|#####5      | 22/40 [00:04<00:03,  5.58it/s]
    465/499      0.206G     0.02032    0.008826     0.01877          1          320:
57%|#####7      | 23/40 [00:04<00:02,  5.80it/s]
    465/499      0.206G     0.02001    0.008581     0.01882          1          320:
57%|#####7      | 23/40 [00:04<00:02,  5.80it/s]
    465/499      0.206G     0.02001    0.008581     0.01882          1          320:
60%|######      | 24/40 [00:04<00:02,  5.67it/s]
    465/499      0.206G     0.01955    0.008387     0.01884          1          320:
60%|######      | 24/40 [00:04<00:02,  5.67it/s]
    465/499      0.206G     0.01955    0.008387     0.01884          1          320:
62%|######2     | 25/40 [00:04<00:02,  5.68it/s]
    465/499      0.206G     0.01925     0.00862     0.01864          4          320:
62%|######2     | 25/40 [00:04<00:02,  5.68it/s]
    465/499      0.206G     0.01925     0.00862     0.01864          4          320:
65%|######5     | 26/40 [00:04<00:02,  5.57it/s]
    465/499      0.206G     0.01884    0.008435     0.01842          1          320:
65%|######5     | 26/40 [00:04<00:02,  5.57it/s]
    465/499      0.206G     0.01884    0.008435     0.01842          1          320:
68%|######7     | 27/40 [00:04<00:02,  5.66it/s]
    465/499      0.206G     0.01858    0.008256     0.01829          1          320:
68%|######7     | 27/40 [00:05<00:02,  5.66it/s]
    465/499      0.206G     0.01858    0.008256     0.01829          1          320:
70%|#######     | 28/40 [00:05<00:02,  5.39it/s]
    465/499      0.206G     0.01873    0.008449      0.0183          4          320:
70%|#######     | 28/40 [00:05<00:02,  5.39it/s]
    465/499      0.206G     0.01873    0.008449      0.0183          4          320:
72%|#######2    | 29/40 [00:05<00:01,  5.51it/s]
    465/499      0.206G      0.0187    0.008411     0.01828          2          320:
72%|#######2    | 29/40 [00:05<00:01,  5.51it/s]
    465/499      0.206G      0.0187    0.008411     0.01828          2          320:
75%|#######5    | 30/40 [00:05<00:01,  5.57it/s]
    465/499      0.206G     0.01835     0.00834     0.01813          2          320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.57it/s]
     465/499      0.206G     0.01835     0.00834     0.01813         2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.64it/s]
     465/499      0.206G     0.01853     0.008296    0.01814         2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.64it/s]
     465/499      0.206G     0.01853     0.008296    0.01814         2        320:
80%|########  | 32/40 [00:05<00:01,  5.55it/s]
     465/499      0.206G     0.01834     0.008211    0.01808         1        320:
80%|########  | 32/40 [00:05<00:01,  5.55it/s]
     465/499      0.206G     0.01834     0.008211    0.01808         1        320:
82%|########2 | 33/40 [00:05<00:01,  5.61it/s]
     465/499      0.206G     0.01906     0.008294     0.0183         4        320:
82%|########2 | 33/40 [00:06<00:01,  5.61it/s]
     465/499      0.206G     0.01906     0.008294     0.0183         4        320:
85%|########5 | 34/40 [00:06<00:01,  5.68it/s]
     465/499      0.206G     0.01921     0.008302    0.01829         2        320:
85%|########5 | 34/40 [00:06<00:01,  5.68it/s]
     465/499      0.206G     0.01921     0.008302    0.01829         2        320:
88%|########7 | 35/40 [00:06<00:00,  5.57it/s]
     465/499      0.206G     0.01948     0.008427    0.01844         3        320:
88%|########7 | 35/40 [00:06<00:00,  5.57it/s]
     465/499      0.206G     0.01948     0.008427    0.01844         3        320:
90%|######### | 36/40 [00:06<00:00,  5.48it/s]
     465/499      0.206G     0.01927     0.00831     0.01834         1        320:
90%|######### | 36/40 [00:06<00:00,  5.48it/s]
     465/499      0.206G     0.01927     0.00831     0.01834         1        320:
92%|#########2| 37/40 [00:06<00:00,  5.57it/s]
     465/499      0.206G      0.0193     0.008457    0.01836         4        320:
92%|#########2| 37/40 [00:06<00:00,  5.57it/s]
     465/499      0.206G      0.0193     0.008457    0.01836         4        320:
95%|#########5| 38/40 [00:06<00:00,  5.23it/s]
     465/499      0.206G     0.01924     0.008534    0.01829         4        320:
95%|#########5| 38/40 [00:07<00:00,  5.23it/s]
     465/499      0.206G     0.01924     0.008534    0.01829         4        320:
98%|#########7| 39/40 [00:07<00:00,  5.13it/s]
     465/499      0.206G     0.01925     0.008689     0.0183         4        320:
98%|#########7| 39/40 [00:07<00:00,  5.13it/s]
     465/499      0.206G     0.01925     0.008689     0.0183         4        320:
100%|##########| 40/40 [00:07<00:00,  4.84it/s]
     465/499      0.206G     0.01925     0.008689     0.0183         4        320:
100%|##########| 40/40 [00:07<00:00,  5.51it/s]


               Class      Images  Instances         P         R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
               Class      Images  Instances         P         R      mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:00, 18.29it/s]
               Class      Images  Instances         P         R      mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:01, 15.51it/s]
```

```
              Class      Images  Instances            P            R        mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 14.90it/s]
              Class      Images  Instances            P            R        mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 14.60it/s]
              Class      Images  Instances            P            R        mAP50
mAP50-95:  50%|#####        | 10/20 [00:00<00:00, 13.42it/s]
              Class      Images  Instances            P            R        mAP50
mAP50-95:  60%|######       | 12/20 [00:00<00:00, 13.57it/s]
              Class      Images  Instances            P            R        mAP50
mAP50-95:  70%|#######      | 14/20 [00:00<00:00, 14.28it/s]
              Class      Images  Instances            P            R        mAP50
mAP50-95:  80%|########     | 16/20 [00:01<00:00, 14.26it/s]
              Class      Images  Instances            P            R        mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 14.20it/s]
              Class      Images  Instances            P            R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.71it/s]
              Class      Images  Instances            P            R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.48it/s]
                all         40         40        0.962        0.965        0.994
0.805

      Epoch     GPU_mem    box_loss    obj_loss    cls_loss   Instances        Size

   0%|           | 0/40 [00:00<?, ?it/s]
     466/499     0.206G     0.02492     0.01644     0.02025           2         320:
 0%|          | 0/40 [00:00<?, ?it/s]
     466/499     0.206G     0.02492     0.01644     0.02025           2         320:
2%|2          | 1/40 [00:00<00:07,  5.35it/s]
     466/499     0.206G     0.01462    0.009543     0.01721           1         320:
2%|2          | 1/40 [00:00<00:07,  5.35it/s]
     466/499     0.206G     0.01462    0.009543     0.01721           1         320:
5%|5          | 2/40 [00:00<00:07,  5.34it/s]
     466/499     0.206G     0.01242    0.007952     0.01617           1         320:
5%|5          | 2/40 [00:00<00:07,  5.34it/s]
     466/499     0.206G     0.01242    0.007952     0.01617           1         320:
8%|7          | 3/40 [00:00<00:06,  5.32it/s]
     466/499     0.206G     0.01202    0.007726     0.01547           2         320:
8%|7          | 3/40 [00:00<00:06,  5.32it/s]
     466/499     0.206G     0.01202    0.007726     0.01547           2         320:
10%|#          | 4/40 [00:00<00:06,  5.32it/s]
     466/499     0.206G     0.01158    0.007652       0.015           2         320:
10%|#          | 4/40 [00:00<00:06,  5.32it/s]
     466/499     0.206G     0.01158    0.007652       0.015           2         320:
12%|#2         | 5/40 [00:00<00:06,  5.33it/s]
     466/499     0.206G      0.0113    0.007037     0.01437           1         320:
12%|#2         | 5/40 [00:01<00:06,  5.33it/s]
     466/499     0.206G      0.0113    0.007037     0.01437           1         320:
15%|#5         | 6/40 [00:01<00:06,  5.46it/s]
```

```
   466/499     0.206G   0.01074   0.006533    0.01379        1        320:
15%|#5        | 6/40 [00:01<00:06,  5.46it/s]
   466/499     0.206G   0.01074   0.006533    0.01379        1        320:
18%|#7        | 7/40 [00:01<00:05,  5.57it/s]
   466/499     0.206G   0.01012   0.006008    0.01351        1        320:
18%|#7        | 7/40 [00:01<00:05,  5.57it/s]
   466/499     0.206G   0.01012   0.006008    0.01351        1        320:
20%|##        | 8/40 [00:01<00:05,  5.65it/s]
   466/499     0.206G   0.01095   0.005763    0.01351        1        320:
20%|##        | 8/40 [00:01<00:05,  5.65it/s]
   466/499     0.206G   0.01095   0.005763    0.01351        1        320:
22%|##2       | 9/40 [00:01<00:05,  5.67it/s]
   466/499     0.206G   0.01244   0.006862    0.01363        2        320:
22%|##2       | 9/40 [00:01<00:05,  5.67it/s]
   466/499     0.206G   0.01244   0.006862    0.01363        2        320:
25%|##5       | 10/40 [00:01<00:05,  5.71it/s]
   466/499     0.206G   0.01483   0.007166    0.01505        2        320:
25%|##5       | 10/40 [00:01<00:05,  5.71it/s]
   466/499     0.206G   0.01483   0.007166    0.01505        2        320:
28%|##7       | 11/40 [00:01<00:05,  5.59it/s]
   466/499     0.206G   0.01539   0.007611    0.01589        4        320:
28%|##7       | 11/40 [00:02<00:05,  5.59it/s]
   466/499     0.206G   0.01539   0.007611    0.01589        4        320:
30%|###       | 12/40 [00:02<00:05,  5.36it/s]
   466/499     0.206G   0.01571   0.007787    0.01644        4        320:
30%|###       | 12/40 [00:02<00:05,  5.36it/s]
   466/499     0.206G   0.01571   0.007787    0.01644        4        320:
32%|###2      | 13/40 [00:02<00:04,  5.49it/s]
   466/499     0.206G   0.01547   0.007721    0.01634        2        320:
32%|###2      | 13/40 [00:02<00:04,  5.49it/s]
   466/499     0.206G   0.01547   0.007721    0.01634        2        320:
35%|###5      | 14/40 [00:02<00:04,  5.59it/s]
   466/499     0.206G   0.01549   0.007544    0.01642        1        320:
35%|###5      | 14/40 [00:02<00:04,  5.59it/s]
   466/499     0.206G   0.01549   0.007544    0.01642        1        320:
38%|###7      | 15/40 [00:02<00:04,  5.64it/s]
   466/499     0.206G   0.01512   0.007544    0.01641        2        320:
38%|###7      | 15/40 [00:02<00:04,  5.64it/s]
   466/499     0.206G   0.01512   0.007544    0.01641        2        320:
40%|####      | 16/40 [00:02<00:04,  5.69it/s]
   466/499     0.206G   0.01668   0.007715     0.017         3        320:
40%|####      | 16/40 [00:03<00:04,  5.69it/s]
   466/499     0.206G   0.01668   0.007715     0.017         3        320:
42%|####2     | 17/40 [00:03<00:04,  5.58it/s]
   466/499     0.206G   0.01671   0.008011    0.01736        4        320:
42%|####2     | 17/40 [00:03<00:04,  5.58it/s]
   466/499     0.206G   0.01671   0.008011    0.01736        4        320:
45%|####5     | 18/40 [00:03<00:04,  5.50it/s]
```

```
    466/499       0.206G      0.01687    0.008389      0.01738           4          320:
45%|####5      | 18/40 [00:03<00:04,  5.50it/s]
    466/499       0.206G      0.01687    0.008389      0.01738           4          320:
48%|####7      | 19/40 [00:03<00:03,  5.59it/s]
    466/499       0.206G       0.0167    0.008268      0.01724           1          320:
48%|####7      | 19/40 [00:03<00:03,  5.59it/s]
    466/499       0.206G       0.0167    0.008268      0.01724           1          320:
50%|#####      | 20/40 [00:03<00:03,  5.66it/s]
    466/499       0.206G      0.01685    0.008716      0.01749           4          320:
50%|#####      | 20/40 [00:03<00:03,  5.66it/s]
    466/499       0.206G      0.01685    0.008716      0.01749           4          320:
52%|#####2     | 21/40 [00:03<00:03,  5.26it/s]
    466/499       0.206G      0.01665    0.008591      0.01752           2          320:
52%|#####2     | 21/40 [00:04<00:03,  5.26it/s]
    466/499       0.206G      0.01665    0.008591      0.01752           2          320:
55%|#####5     | 22/40 [00:04<00:03,  5.28it/s]
    466/499       0.206G      0.01688    0.008716      0.01787           4          320:
55%|#####5     | 22/40 [00:04<00:03,  5.28it/s]
    466/499       0.206G      0.01688    0.008716      0.01787           4          320:
57%|#####7     | 23/40 [00:04<00:03,  5.21it/s]
    466/499       0.206G      0.01667    0.008565      0.01776           2          320:
57%|#####7     | 23/40 [00:04<00:03,  5.21it/s]
    466/499       0.206G      0.01667    0.008565      0.01776           2          320:
60%|######     | 24/40 [00:04<00:03,  5.31it/s]
    466/499       0.206G      0.01624    0.008392      0.01759           1          320:
60%|######     | 24/40 [00:04<00:03,  5.31it/s]
    466/499       0.206G      0.01624    0.008392      0.01759           1          320:
62%|######2    | 25/40 [00:04<00:02,  5.46it/s]
    466/499       0.206G       0.0162    0.008688      0.01768           4          320:
62%|######2    | 25/40 [00:04<00:02,  5.46it/s]
    466/499       0.206G       0.0162    0.008688      0.01768           4          320:
65%|######5    | 26/40 [00:04<00:02,  5.49it/s]
    466/499       0.206G      0.01617    0.008559      0.01757           2          320:
65%|######5    | 26/40 [00:04<00:02,  5.49it/s]
    466/499       0.206G      0.01617    0.008559      0.01757           2          320:
68%|######7    | 27/40 [00:04<00:02,  5.48it/s]
    466/499       0.206G      0.01587    0.008385      0.01741           1          320:
68%|######7    | 27/40 [00:05<00:02,  5.48it/s]
    466/499       0.206G      0.01587    0.008385      0.01741           1          320:
70%|#######    | 28/40 [00:05<00:02,  5.58it/s]
    466/499       0.206G      0.01611    0.008231       0.0174           1          320:
70%|#######    | 28/40 [00:05<00:02,  5.58it/s]
    466/499       0.206G      0.01611    0.008231       0.0174           1          320:
72%|#######2   | 29/40 [00:05<00:01,  5.60it/s]
    466/499       0.206G       0.0162    0.008193      0.01732           2          320:
72%|#######2   | 29/40 [00:05<00:01,  5.60it/s]
    466/499       0.206G       0.0162    0.008193      0.01732           2          320:
75%|#######5   | 30/40 [00:05<00:01,  5.70it/s]
```

```
    466/499      0.206G      0.01616     0.008164      0.01741           2          320:
75%|#######5  | 30/40 [00:05<00:01,  5.70it/s]
    466/499      0.206G      0.01616     0.008164      0.01741           2          320:
78%|#######7  | 31/40 [00:05<00:01,  5.74it/s]
    466/499      0.206G       0.016      0.008001       0.0173           1          320:
78%|#######7  | 31/40 [00:05<00:01,  5.74it/s]
    466/499      0.206G       0.016      0.008001       0.0173           1          320:
80%|########  | 32/40 [00:05<00:01,  5.71it/s]
    466/499      0.206G      0.01607      0.00817      0.01751           4          320:
80%|########  | 32/40 [00:05<00:01,  5.71it/s]
    466/499      0.206G      0.01607      0.00817      0.01751           4          320:
82%|########2 | 33/40 [00:05<00:01,  5.79it/s]
    466/499      0.206G      0.01597      0.00815      0.01745           2          320:
82%|########2 | 33/40 [00:06<00:01,  5.79it/s]
    466/499      0.206G      0.01597      0.00815      0.01745           2          320:
85%|########5 | 34/40 [00:06<00:01,  5.80it/s]
    466/499      0.206G      0.01604     0.008273      0.01749           4          320:
85%|########5 | 34/40 [00:06<00:01,  5.80it/s]
    466/499      0.206G      0.01604     0.008273      0.01749           4          320:
88%|########7 | 35/40 [00:06<00:00,  5.60it/s]
    466/499      0.206G       0.0161     0.008397      0.01756           4          320:
88%|########7 | 35/40 [00:06<00:00,  5.60it/s]
    466/499      0.206G       0.0161     0.008397      0.01756           4          320:
90%|######### | 36/40 [00:06<00:00,  5.54it/s]
    466/499      0.206G      0.01601     0.008333      0.01742           2          320:
90%|######### | 36/40 [00:06<00:00,  5.54it/s]
    466/499      0.206G      0.01601     0.008333      0.01742           2          320:
92%|#########2| 37/40 [00:06<00:00,  5.62it/s]
    466/499      0.206G      0.01598     0.008473      0.01759           4          320:
92%|#########2| 37/40 [00:06<00:00,  5.62it/s]
    466/499      0.206G      0.01598     0.008473      0.01759           4          320:
95%|#########5| 38/40 [00:06<00:00,  5.43it/s]
    466/499      0.206G      0.01603     0.008608      0.01757           4          320:
95%|#########5| 38/40 [00:07<00:00,  5.43it/s]
    466/499      0.206G      0.01603     0.008608      0.01757           4          320:
98%|#########7| 39/40 [00:07<00:00,  5.48it/s]
    466/499      0.206G      0.01666     0.008598      0.01777           3          320:
98%|#########7| 39/40 [00:07<00:00,  5.48it/s]
    466/499      0.206G      0.01666     0.008598      0.01777           3          320:
100%|##########| 40/40 [00:07<00:00,  5.58it/s]
    466/499      0.206G      0.01666     0.008598      0.01777           3          320:
100%|##########| 40/40 [00:07<00:00,  5.53it/s]


            Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
            Class      Images  Instances          P          R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 13.46it/s]
            Class      Images  Instances          P          R      mAP50
```

```
mAP50-95:  20%|##        | 4/20 [00:00<00:01, 14.25it/s]
              Class      Images  Instances         P         R      mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 15.85it/s]
              Class      Images  Instances         P         R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 16.72it/s]
              Class      Images  Instances         P         R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 17.25it/s]
              Class      Images  Instances         P         R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 17.49it/s]
              Class      Images  Instances         P         R      mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 17.74it/s]
              Class      Images  Instances         P         R      mAP50
mAP50-95:  80%|######## | 16/20 [00:00<00:00, 15.80it/s]
              Class      Images  Instances         P         R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 16.50it/s]
              Class      Images  Instances         P         R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.27it/s]
              Class      Images  Instances         P         R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.33it/s]
                all         40         40     0.962     0.965      0.994
0.805
```

```
     Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances      Size

  0%|          | 0/40 [00:00<?, ?it/s]
   467/499     0.206G    0.02823    0.01287     0.0231          4       320:
0%|          | 0/40 [00:00<?, ?it/s]
   467/499     0.206G    0.02823    0.01287     0.0231          4       320:
2%|2        | 1/40 [00:00<00:06,  5.78it/s]
   467/499     0.206G    0.02669    0.01419    0.02553          4       320:
2%|2        | 1/40 [00:00<00:06,  5.78it/s]
   467/499     0.206G    0.02669    0.01419    0.02553          4       320:
5%|5        | 2/40 [00:00<00:06,  5.47it/s]
   467/499     0.206G    0.02034    0.01188    0.02144          2       320:
5%|5        | 2/40 [00:00<00:06,  5.47it/s]
   467/499     0.206G    0.02034    0.01188    0.02144          2       320:
8%|7        | 3/40 [00:00<00:06,  5.63it/s]
   467/499     0.206G    0.01794    0.01002     0.0199          1       320:
8%|7        | 3/40 [00:00<00:06,  5.63it/s]
   467/499     0.206G    0.01794    0.01002     0.0199          1       320:
10%|#        | 4/40 [00:00<00:06,  5.64it/s]
   467/499     0.206G     0.0168   0.008715    0.01861          1       320:
10%|#        | 4/40 [00:00<00:06,  5.64it/s]
   467/499     0.206G     0.0168   0.008715    0.01861          1       320:
12%|#2       | 5/40 [00:00<00:06,  5.76it/s]
   467/499     0.206G    0.01794   0.008996    0.02011          4       320:
12%|#2       | 5/40 [00:01<00:06,  5.76it/s]
   467/499     0.206G    0.01794   0.008996    0.02011          4       320:
```

```
15%|#5           | 6/40 [00:01<00:06,  5.61it/s]
    467/499     0.206G     0.01677   0.008506   0.02052        1          320:
15%|#5           | 6/40 [00:01<00:06,  5.61it/s]
    467/499     0.206G     0.01677   0.008506   0.02052        1          320:
18%|#7           | 7/40 [00:01<00:05,  5.61it/s]
    467/499     0.206G     0.01769   0.008117   0.01959        2          320:
18%|#7           | 7/40 [00:01<00:05,  5.61it/s]
    467/499     0.206G     0.01769   0.008117   0.01959        2          320:
20%|##           | 8/40 [00:01<00:05,  5.51it/s]
    467/499     0.206G     0.01698   0.007558   0.01939        1          320:
20%|##           | 8/40 [00:01<00:05,  5.51it/s]
    467/499     0.206G     0.01698   0.007558   0.01939        1          320:
22%|##2          | 9/40 [00:01<00:05,  5.65it/s]
    467/499     0.206G      0.0165   0.007254   0.01943        1          320:
22%|##2          | 9/40 [00:01<00:05,  5.65it/s]
    467/499     0.206G      0.0165   0.007254   0.01943        1          320:
25%|##5          | 10/40 [00:01<00:05,  5.63it/s]
    467/499     0.206G     0.01547   0.006874   0.01881        1          320:
25%|##5          | 10/40 [00:01<00:05,  5.63it/s]
    467/499     0.206G     0.01547   0.006874   0.01881        1          320:
28%|##7          | 11/40 [00:01<00:05,  5.74it/s]
    467/499     0.206G     0.01623   0.007425    0.0191        4          320:
28%|##7          | 11/40 [00:02<00:05,  5.74it/s]
    467/499     0.206G     0.01623   0.007425    0.0191        4          320:
30%|###          | 12/40 [00:02<00:05,  5.19it/s]
    467/499     0.206G      0.0176   0.008056   0.01952        4          320:
30%|###          | 12/40 [00:02<00:05,  5.19it/s]
    467/499     0.206G      0.0176   0.008056   0.01952        4          320:
32%|###2         | 13/40 [00:02<00:05,  5.36it/s]
    467/499     0.206G     0.01687   0.007759   0.01905        1          320:
32%|###2         | 13/40 [00:02<00:05,  5.36it/s]
    467/499     0.206G     0.01687   0.007759   0.01905        1          320:
35%|###5         | 14/40 [00:02<00:04,  5.49it/s]
    467/499     0.206G     0.01688   0.008158   0.01933        4          320:
35%|###5         | 14/40 [00:02<00:04,  5.49it/s]
    467/499     0.206G     0.01688   0.008158   0.01933        4          320:
38%|###7         | 15/40 [00:02<00:04,  5.31it/s]
    467/499     0.206G     0.01677   0.007962   0.01896        1          320:
38%|###7         | 15/40 [00:02<00:04,  5.31it/s]
    467/499     0.206G     0.01677   0.007962   0.01896        1          320:
40%|####         | 16/40 [00:02<00:04,  5.56it/s]
    467/499     0.206G     0.01669   0.008374   0.01908        4          320:
40%|####         | 16/40 [00:03<00:04,  5.56it/s]
    467/499     0.206G     0.01669   0.008374   0.01908        4          320:
42%|####2        | 17/40 [00:03<00:04,  5.49it/s]
    467/499     0.206G      0.0163   0.008176   0.01875        2          320:
42%|####2        | 17/40 [00:03<00:04,  5.49it/s]
    467/499     0.206G      0.0163   0.008176   0.01875        2          320:
```

```
45%|####5      | 18/40 [00:03<00:03,  5.58it/s]
     467/499       0.206G    0.01808    0.00804    0.01901          2        320:
45%|####5      | 18/40 [00:03<00:03,  5.58it/s]
     467/499       0.206G    0.01808    0.00804    0.01901          2        320:
48%|####7      | 19/40 [00:03<00:03,  5.35it/s]
     467/499       0.206G    0.02001   0.008171    0.01913          3        320:
48%|####7      | 19/40 [00:03<00:03,  5.35it/s]
     467/499       0.206G    0.02001   0.008171    0.01913          3        320:
50%|#####      | 20/40 [00:03<00:03,  5.21it/s]
     467/499       0.206G    0.01949   0.007904    0.01972          1        320:
50%|#####      | 20/40 [00:03<00:03,  5.21it/s]
     467/499       0.206G    0.01949   0.007904    0.01972          1        320:
52%|#####2     | 21/40 [00:03<00:03,  5.52it/s]
     467/499       0.206G     0.0193   0.007777    0.01943          1        320:
52%|#####2     | 21/40 [00:03<00:03,  5.52it/s]
     467/499       0.206G     0.0193   0.007777    0.01943          1        320:
55%|#####5     | 22/40 [00:03<00:03,  5.46it/s]
     467/499       0.206G     0.0191   0.007594    0.01924          1        320:
55%|#####5     | 22/40 [00:04<00:03,  5.46it/s]
     467/499       0.206G     0.0191   0.007594    0.01924          1        320:
57%|#####7     | 23/40 [00:04<00:03,  5.56it/s]
     467/499       0.206G     0.0201   0.007652    0.01909          2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.56it/s]
     467/499       0.206G     0.0201   0.007652    0.01909          2        320:
60%|######     | 24/40 [00:04<00:02,  5.63it/s]
     467/499       0.206G    0.01963    0.00753    0.01879          1        320:
60%|######     | 24/40 [00:04<00:02,  5.63it/s]
     467/499       0.206G    0.01963    0.00753    0.01879          1        320:
62%|######2    | 25/40 [00:04<00:02,  5.67it/s]
     467/499       0.206G    0.01933   0.007475     0.0192          1        320:
62%|######2    | 25/40 [00:04<00:02,  5.67it/s]
     467/499       0.206G    0.01933   0.007475     0.0192          1        320:
65%|######5    | 26/40 [00:04<00:02,  5.71it/s]
     467/499       0.206G       0.02   0.007517    0.01906          2        320:
65%|######5    | 26/40 [00:04<00:02,  5.71it/s]
     467/499       0.206G       0.02   0.007517    0.01906          2        320:
68%|######7    | 27/40 [00:04<00:02,  5.18it/s]
     467/499       0.206G    0.01968   0.007487    0.01894          2        320:
68%|######7    | 27/40 [00:05<00:02,  5.18it/s]
     467/499       0.206G    0.01968   0.007487    0.01894          2        320:
70%|#######    | 28/40 [00:05<00:02,  5.35it/s]
     467/499       0.206G    0.01965   0.007678    0.01898          4        320:
70%|#######    | 28/40 [00:05<00:02,  5.35it/s]
     467/499       0.206G    0.01965   0.007678    0.01898          4        320:
72%|#######2   | 29/40 [00:05<00:02,  5.09it/s]
     467/499       0.206G    0.02025   0.007724    0.01904          3        320:
72%|#######2   | 29/40 [00:05<00:02,  5.09it/s]
     467/499       0.206G    0.02025   0.007724    0.01904          3        320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.03it/s]
    467/499     0.206G    0.02078    0.007689    0.01888         2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.03it/s]
    467/499     0.206G    0.02078    0.007689    0.01888         2        320:
78%|#######7  | 31/40 [00:05<00:01,  4.99it/s]
    467/499     0.206G     0.0209    0.007611    0.01866         1        320:
78%|#######7  | 31/40 [00:05<00:01,  4.99it/s]
    467/499     0.206G     0.0209    0.007611    0.01866         1        320:
80%|########  | 32/40 [00:05<00:01,  4.97it/s]
    467/499     0.206G    0.02115    0.007829    0.01898         3        320:
80%|########  | 32/40 [00:06<00:01,  4.97it/s]
    467/499     0.206G    0.02115    0.007829    0.01898         3        320:
82%|########2 | 33/40 [00:06<00:01,  4.94it/s]
    467/499     0.206G    0.02073    0.007689     0.0188         1        320:
82%|########2 | 33/40 [00:06<00:01,  4.94it/s]
    467/499     0.206G    0.02073    0.007689     0.0188         1        320:
85%|########5 | 34/40 [00:06<00:01,  5.05it/s]
    467/499     0.206G    0.02031    0.007586    0.01861         1        320:
85%|########5 | 34/40 [00:06<00:01,  5.05it/s]
    467/499     0.206G    0.02031    0.007586    0.01861         1        320:
88%|########7 | 35/40 [00:06<00:01,  4.91it/s]
    467/499     0.206G       0.02    0.007556    0.01847         2        320:
88%|########7 | 35/40 [00:06<00:01,  4.91it/s]
    467/499     0.206G       0.02    0.007556    0.01847         2        320:
90%|######### | 36/40 [00:06<00:00,  5.00it/s]
    467/499     0.206G     0.0198    0.007465    0.01831         1        320:
90%|######### | 36/40 [00:06<00:00,  5.00it/s]
    467/499     0.206G     0.0198    0.007465    0.01831         1        320:
92%|#########2| 37/40 [00:06<00:00,  4.98it/s]
    467/499     0.206G    0.02056    0.007549    0.01835         2        320:
92%|#########2| 37/40 [00:07<00:00,  4.98it/s]
    467/499     0.206G    0.02056    0.007549    0.01835         2        320:
95%|#########5| 38/40 [00:07<00:00,  4.95it/s]
    467/499     0.206G    0.02054    0.007772    0.01834         4        320:
95%|#########5| 38/40 [00:07<00:00,  4.95it/s]
    467/499     0.206G    0.02054    0.007772    0.01834         4        320:
98%|#########7| 39/40 [00:07<00:00,  4.83it/s]
    467/499     0.206G    0.02039    0.007656    0.01828         1        320:
98%|#########7| 39/40 [00:07<00:00,  4.83it/s]
    467/499     0.206G    0.02039    0.007656    0.01828         1        320:
100%|##########| 40/40 [00:07<00:00,  4.97it/s]
    467/499     0.206G    0.02039    0.007656    0.01828         1        320:
100%|##########| 40/40 [00:07<00:00,  5.30it/s]

          Class     Images  Instances          P          R       mAP50
mAP50-95:    0%|             | 0/20 [00:00<?, ?it/s]
          Class     Images  Instances          P          R       mAP50
mAP50-95:   10%|#            | 2/20 [00:00<00:01, 14.55it/s]
```

```
               Class     Images  Instances          P          R       mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:01, 14.36it/s]
               Class     Images  Instances          P          R       mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 15.06it/s]
               Class     Images  Instances          P          R       mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 16.19it/s]
               Class     Images  Instances          P          R       mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 16.73it/s]
               Class     Images  Instances          P          R       mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 16.47it/s]
               Class     Images  Instances          P          R       mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 16.31it/s]
               Class     Images  Instances          P          R       mAP50
mAP50-95:  80%|########    | 16/20 [00:01<00:00, 15.58it/s]
               Class     Images  Instances          P          R       mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 16.26it/s]
               Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.84it/s]
               Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.18it/s]
                 all        40        40      0.973      0.971      0.993
0.807

       Epoch    GPU_mem    box_loss    obj_loss    cls_loss  Instances        Size

  0%|           | 0/40 [00:00<?, ?it/s]
     468/499      0.206G     0.04694     0.01154     0.02176          4        320:
0%|           | 0/40 [00:00<?, ?it/s]
     468/499      0.206G     0.04694     0.01154     0.02176          4        320:
2%|2          | 1/40 [00:00<00:06,  6.31it/s]
     468/499      0.206G     0.03257    0.007866     0.01841          1        320:
2%|2          | 1/40 [00:00<00:06,  6.31it/s]
     468/499      0.206G     0.03257    0.007866     0.01841          1        320:
5%|5          | 2/40 [00:00<00:06,  5.70it/s]
     468/499      0.206G     0.02421    0.007109     0.01903          2        320:
5%|5          | 2/40 [00:00<00:06,  5.70it/s]
     468/499      0.206G     0.02421    0.007109     0.01903          2        320:
8%|7          | 3/40 [00:00<00:06,  5.75it/s]
     468/499      0.206G     0.02171    0.007318     0.01752          2        320:
8%|7          | 3/40 [00:00<00:06,  5.75it/s]
     468/499      0.206G     0.02171    0.007318     0.01752          2        320:
10%|#         | 4/40 [00:00<00:06,  5.56it/s]
     468/499      0.206G     0.02303     0.00888     0.01837          4        320:
10%|#         | 4/40 [00:00<00:06,  5.56it/s]
     468/499      0.206G     0.02303     0.00888     0.01837          4        320:
12%|#2        | 5/40 [00:00<00:06,  5.47it/s]
     468/499      0.206G     0.02085    0.008352     0.01776          2        320:
12%|#2        | 5/40 [00:01<00:06,  5.47it/s]
```

```
    468/499     0.206G    0.02085    0.008352    0.01776         2         320:
15%|#5         | 6/40 [00:01<00:06,  5.58it/s]
    468/499     0.206G    0.02107    0.007699    0.01833         1         320:
15%|#5         | 6/40 [00:01<00:06,  5.58it/s]
    468/499     0.206G    0.02107    0.007699    0.01833         1         320:
18%|#7         | 7/40 [00:01<00:05,  5.66it/s]
    468/499     0.206G    0.02005    0.007722    0.01779         3         320:
18%|#7         | 7/40 [00:01<00:05,  5.66it/s]
    468/499     0.206G    0.02005    0.007722    0.01779         3         320:
20%|##         | 8/40 [00:01<00:05,  5.87it/s]
    468/499     0.206G    0.01904    0.007199    0.01736         1         320:
20%|##         | 8/40 [00:01<00:05,  5.87it/s]
    468/499     0.206G    0.01904    0.007199    0.01736         1         320:
22%|##2        | 9/40 [00:01<00:05,  5.69it/s]
    468/499     0.206G     0.0183    0.006993    0.01702         1         320:
22%|##2        | 9/40 [00:01<00:05,  5.69it/s]
    468/499     0.206G     0.0183    0.006993    0.01702         1         320:
25%|##5        | 10/40 [00:01<00:05,  5.70it/s]
    468/499     0.206G    0.01937    0.007261    0.01775         2         320:
25%|##5        | 10/40 [00:01<00:05,  5.70it/s]
    468/499     0.206G    0.01937    0.007261    0.01775         2         320:
28%|##7        | 11/40 [00:01<00:05,  5.74it/s]
    468/499     0.206G    0.01986    0.00818     0.01812         3         320:
28%|##7        | 11/40 [00:02<00:05,  5.74it/s]
    468/499     0.206G    0.01986    0.00818     0.01812         3         320:
30%|###        | 12/40 [00:02<00:04,  5.76it/s]
    468/499     0.206G    0.01991    0.008335    0.01769         2         320:
30%|###        | 12/40 [00:02<00:04,  5.76it/s]
    468/499     0.206G    0.01991    0.008335    0.01769         2         320:
32%|###2       | 13/40 [00:02<00:04,  5.77it/s]
    468/499     0.206G    0.01954    0.008521    0.01749         2         320:
32%|###2       | 13/40 [00:02<00:04,  5.77it/s]
    468/499     0.206G    0.01954    0.008521    0.01749         2         320:
35%|###5       | 14/40 [00:02<00:04,  5.63it/s]
    468/499     0.206G    0.01879    0.008354    0.01745         2         320:
35%|###5       | 14/40 [00:02<00:04,  5.63it/s]
    468/499     0.206G    0.01879    0.008354    0.01745         2         320:
38%|###7       | 15/40 [00:02<00:04,  5.69it/s]
    468/499     0.206G    0.01915    0.008051    0.01747         1         320:
38%|###7       | 15/40 [00:02<00:04,  5.69it/s]
    468/499     0.206G    0.01915    0.008051    0.01747         1         320:
40%|####       | 16/40 [00:02<00:04,  5.70it/s]
    468/499     0.206G    0.01863    0.007778    0.01729         1         320:
40%|####       | 16/40 [00:02<00:04,  5.70it/s]
    468/499     0.206G    0.01863    0.007778    0.01729         1         320:
42%|####2      | 17/40 [00:02<00:04,  5.73it/s]
    468/499     0.206G    0.01806    0.007533    0.01698         1         320:
42%|####2      | 17/40 [00:03<00:04,  5.73it/s]
```

```
     468/499      0.206G     0.01806     0.007533      0.01698              1            320:
45%|####5     | 18/40 [00:03<00:03,  5.76it/s]
     468/499      0.206G     0.01845     0.007803      0.01755              4            320:
45%|####5     | 18/40 [00:03<00:03,  5.76it/s]
     468/499      0.206G     0.01845     0.007803      0.01755              4            320:
48%|####7     | 19/40 [00:03<00:03,  5.76it/s]
     468/499      0.206G     0.01868     0.007896      0.01751              2            320:
48%|####7     | 19/40 [00:03<00:03,  5.76it/s]
     468/499      0.206G     0.01868     0.007896      0.01751              2            320:
50%|#####     | 20/40 [00:03<00:03,  5.48it/s]
     468/499      0.206G     0.01885     0.008143      0.01771              4            320:
50%|#####     | 20/40 [00:03<00:03,  5.48it/s]
     468/499      0.206G     0.01885     0.008143      0.01771              4            320:
52%|#####2    | 21/40 [00:03<00:03,  5.43it/s]
     468/499      0.206G     0.01868     0.008208      0.01749              2            320:
52%|#####2    | 21/40 [00:03<00:03,  5.43it/s]
     468/499      0.206G     0.01868     0.008208      0.01749              2            320:
55%|#####5    | 22/40 [00:03<00:03,  5.54it/s]
     468/499      0.206G     0.01917     0.008378      0.01768              4            320:
55%|#####5    | 22/40 [00:04<00:03,  5.54it/s]
     468/499      0.206G     0.01917     0.008378      0.01768              4            320:
57%|#####7    | 23/40 [00:04<00:03,  5.34it/s]
     468/499      0.206G     0.02055     0.008467      0.01826              4            320:
57%|#####7    | 23/40 [00:04<00:03,  5.34it/s]
     468/499      0.206G     0.02055     0.008467      0.01826              4            320:
60%|######    | 24/40 [00:04<00:02,  5.46it/s]
     468/499      0.206G     0.02005     0.008525       0.0181              2            320:
60%|######    | 24/40 [00:04<00:02,  5.46it/s]
     468/499      0.206G     0.02005     0.008525       0.0181              2            320:
62%|######2   | 25/40 [00:04<00:02,  5.41it/s]
     468/499      0.206G     0.02079     0.008524      0.01828              3            320:
62%|######2   | 25/40 [00:04<00:02,  5.41it/s]
     468/499      0.206G     0.02079     0.008524      0.01828              3            320:
65%|######5   | 26/40 [00:04<00:02,  5.25it/s]
     468/499      0.206G     0.02106     0.008743      0.01834              4            320:
65%|######5   | 26/40 [00:04<00:02,  5.25it/s]
     468/499      0.206G     0.02106     0.008743      0.01834              4            320:
68%|######7   | 27/40 [00:04<00:02,  5.27it/s]
     468/499      0.206G     0.02118     0.008747      0.01823              2            320:
68%|######7   | 27/40 [00:05<00:02,  5.27it/s]
     468/499      0.206G     0.02118     0.008747      0.01823              2            320:
70%|#######   | 28/40 [00:05<00:02,  5.41it/s]
     468/499      0.206G     0.02166     0.008928      0.01876              2            320:
70%|#######   | 28/40 [00:05<00:02,  5.41it/s]
     468/499      0.206G     0.02166     0.008928      0.01876              2            320:
72%|#######2  | 29/40 [00:05<00:02,  5.39it/s]
     468/499      0.206G     0.02253     0.008818      0.01861              2            320:
72%|#######2  | 29/40 [00:05<00:02,  5.39it/s]
```

```
     468/499      0.206G      0.02253     0.008818      0.01861          2          320:
75%|#######5  | 30/40 [00:05<00:01,  5.49it/s]
     468/499      0.206G      0.02249     0.009109      0.01872          4          320:
75%|#######5  | 30/40 [00:05<00:01,  5.49it/s]
     468/499      0.206G      0.02249     0.009109      0.01872          4          320:
78%|#######7  | 31/40 [00:05<00:01,  5.44it/s]
     468/499      0.206G      0.02346     0.008962      0.01881          2          320:
78%|#######7  | 31/40 [00:05<00:01,  5.44it/s]
     468/499      0.206G      0.02346     0.008962      0.01881          2          320:
80%|########  | 32/40 [00:05<00:01,  5.23it/s]
     468/499      0.206G      0.02309     0.008852      0.01875          2          320:
80%|########  | 32/40 [00:05<00:01,  5.23it/s]
     468/499      0.206G      0.02309     0.008852      0.01875          2          320:
82%|########2 | 33/40 [00:05<00:01,  5.42it/s]
     468/499      0.206G      0.02277     0.008782      0.01864          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.42it/s]
     468/499      0.206G      0.02277     0.008782      0.01864          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.54it/s]
     468/499      0.206G      0.02308     0.009052      0.01892          4          320:
85%|########5 | 34/40 [00:06<00:01,  5.54it/s]
     468/499      0.206G      0.02308     0.009052      0.01892          4          320:
88%|########7 | 35/40 [00:06<00:00,  5.62it/s]
     468/499      0.206G      0.02265     0.009042      0.01887          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.62it/s]
     468/499      0.206G      0.02265     0.009042      0.01887          2          320:
90%|######### | 36/40 [00:06<00:00,  5.13it/s]
     468/499      0.206G       0.0223     0.009143      0.01875          4          320:
90%|######### | 36/40 [00:06<00:00,  5.13it/s]
     468/499      0.206G       0.0223     0.009143      0.01875          4          320:
92%|#########2| 37/40 [00:06<00:00,  5.32it/s]
     468/499      0.206G      0.02254     0.009109      0.01864          2          320:
92%|#########2| 37/40 [00:06<00:00,  5.32it/s]
     468/499      0.206G      0.02254     0.009109      0.01864          2          320:
95%|#########5| 38/40 [00:06<00:00,  5.46it/s]
     468/499      0.206G      0.02252     0.009075      0.01876          2          320:
95%|#########5| 38/40 [00:07<00:00,  5.46it/s]
     468/499      0.206G      0.02252     0.009075      0.01876          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.26it/s]
     468/499      0.206G      0.02257     0.009036      0.01872          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.26it/s]
     468/499      0.206G      0.02257     0.009036      0.01872          2          320:
100%|##########| 40/40 [00:07<00:00,  5.41it/s]
     468/499      0.206G      0.02257     0.009036      0.01872          2          320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]

             Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|          | 0/20 [00:00<?, ?it/s]
             Class     Images  Instances          P          R      mAP50
```

```
mAP50-95:  10%|#           | 2/20 [00:00<00:00, 18.27it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:00, 16.81it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 16.42it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 17.11it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 15.94it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 15.82it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 16.60it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:00<00:00, 17.10it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.46it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.70it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.02it/s]
                  all         40         40      0.985      0.975      0.993
0.807

      Epoch    GPU_mem    box_loss    obj_loss    cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
     469/499     0.206G    0.02322    0.01143    0.01808          4        320:
0%|           | 0/40 [00:00<?, ?it/s]
     469/499     0.206G    0.02322    0.01143    0.01808          4        320:
2%|2          | 1/40 [00:00<00:06,  5.82it/s]
     469/499     0.206G    0.02077    0.01175    0.01688          2        320:
2%|2          | 1/40 [00:00<00:06,  5.82it/s]
     469/499     0.206G    0.02077    0.01175    0.01688          2        320:
5%|5          | 2/40 [00:00<00:07,  5.25it/s]
     469/499     0.206G    0.02357     0.0138    0.02043          4        320:
5%|5          | 2/40 [00:00<00:07,  5.25it/s]
     469/499     0.206G    0.02357     0.0138    0.02043          4        320:
8%|7          | 3/40 [00:00<00:06,  5.29it/s]
     469/499     0.206G    0.02711    0.01216    0.02626          2        320:
8%|7          | 3/40 [00:00<00:06,  5.29it/s]
     469/499     0.206G    0.02711    0.01216    0.02626          2        320:
10%|#          | 4/40 [00:00<00:07,  5.14it/s]
     469/499     0.206G    0.02314    0.01024    0.02343          1        320:
10%|#          | 4/40 [00:00<00:07,  5.14it/s]
     469/499     0.206G    0.02314    0.01024    0.02343          1        320:
12%|#2         | 5/40 [00:00<00:06,  5.34it/s]
     469/499     0.206G    0.02081    0.00916    0.02189          1        320:
```

```
12%|#2        | 5/40 [00:01<00:06,  5.34it/s]
    469/499    0.206G    0.02081    0.00916    0.02189         1        320:
15%|#5        | 6/40 [00:01<00:06,  5.66it/s]
    469/499    0.206G    0.02066    0.009977   0.02156         4        320:
15%|#5        | 6/40 [00:01<00:06,  5.66it/s]
    469/499    0.206G    0.02066    0.009977   0.02156         4        320:
18%|#7        | 7/40 [00:01<00:06,  5.39it/s]
    469/499    0.206G    0.0196     0.009659   0.02066         2        320:
18%|#7        | 7/40 [00:01<00:06,  5.39it/s]
    469/499    0.206G    0.0196     0.009659   0.02066         2        320:
20%|##        | 8/40 [00:01<00:05,  5.50it/s]
    469/499    0.206G    0.019      0.009353   0.02029         2        320:
20%|##        | 8/40 [00:01<00:05,  5.50it/s]
    469/499    0.206G    0.019      0.009353   0.02029         2        320:
22%|##2       | 9/40 [00:01<00:05,  5.60it/s]
    469/499    0.206G    0.01866    0.009193   0.0198          2        320:
22%|##2       | 9/40 [00:01<00:05,  5.60it/s]
    469/499    0.206G    0.01866    0.009193   0.0198          2        320:
25%|##5       | 10/40 [00:01<00:05,  5.66it/s]
    469/499    0.206G    0.01811    0.009476   0.01963         4        320:
25%|##5       | 10/40 [00:01<00:05,  5.66it/s]
    469/499    0.206G    0.01811    0.009476   0.01963         4        320:
28%|##7       | 11/40 [00:01<00:05,  5.69it/s]
    469/499    0.206G    0.01731    0.009047   0.02029         1        320:
28%|##7       | 11/40 [00:02<00:05,  5.69it/s]
    469/499    0.206G    0.01731    0.009047   0.02029         1        320:
30%|###       | 12/40 [00:02<00:05,  5.58it/s]
    469/499    0.206G    0.01651    0.008574   0.02064         1        320:
30%|###       | 12/40 [00:02<00:05,  5.58it/s]
    469/499    0.206G    0.01651    0.008574   0.02064         1        320:
32%|###2      | 13/40 [00:02<00:04,  5.50it/s]
    469/499    0.206G    0.0159     0.00824    0.02043         1        320:
32%|###2      | 13/40 [00:02<00:04,  5.50it/s]
    469/499    0.206G    0.0159     0.00824    0.02043         1        320:
35%|###5      | 14/40 [00:02<00:04,  5.57it/s]
    469/499    0.206G    0.01819    0.008234   0.02009         2        320:
35%|###5      | 14/40 [00:02<00:04,  5.57it/s]
    469/499    0.206G    0.01819    0.008234   0.02009         2        320:
38%|###7      | 15/40 [00:02<00:04,  5.49it/s]
    469/499    0.206G    0.01809    0.008532   0.02051         4        320:
38%|###7      | 15/40 [00:02<00:04,  5.49it/s]
    469/499    0.206G    0.01809    0.008532   0.02051         4        320:
40%|####      | 16/40 [00:02<00:04,  5.44it/s]
    469/499    0.206G    0.01765    0.008298   0.02022         1        320:
40%|####      | 16/40 [00:03<00:04,  5.44it/s]
    469/499    0.206G    0.01765    0.008298   0.02022         1        320:
42%|####2     | 17/40 [00:03<00:04,  5.28it/s]
    469/499    0.206G    0.01898    0.008211   0.02046         4        320:
```

```
42%|####2      | 17/40 [00:03<00:04,  5.28it/s]
    469/499      0.206G      0.01898    0.008211    0.02046          4          320:
45%|####5      | 18/40 [00:03<00:04,  5.17it/s]
    469/499      0.206G      0.01831    0.007969    0.02004          1          320:
45%|####5      | 18/40 [00:03<00:04,  5.17it/s]
    469/499      0.206G      0.01831    0.007969    0.02004          1          320:
48%|####7      | 19/40 [00:03<00:04,  5.03it/s]
    469/499      0.206G      0.01787    0.007737    0.01966          1          320:
48%|####7      | 19/40 [00:03<00:04,  5.03it/s]
    469/499      0.206G      0.01787    0.007737    0.01966          1          320:
50%|#####      | 20/40 [00:03<00:03,  5.03it/s]
    469/499      0.206G      0.01734    0.007499    0.01942          1          320:
50%|#####      | 20/40 [00:03<00:03,  5.03it/s]
    469/499      0.206G      0.01734    0.007499    0.01942          1          320:
52%|#####2     | 21/40 [00:03<00:03,  5.11it/s]
    469/499      0.206G      0.01694    0.007276    0.01916          1          320:
52%|#####2     | 21/40 [00:04<00:03,  5.11it/s]
    469/499      0.206G      0.01694    0.007276    0.01916          1          320:
55%|#####5     | 22/40 [00:04<00:03,  5.04it/s]
    469/499      0.206G      0.01885    0.007325    0.01965          3          320:
55%|#####5     | 22/40 [00:04<00:03,  5.04it/s]
    469/499      0.206G      0.01885    0.007325    0.01965          3          320:
57%|#####7     | 23/40 [00:04<00:03,  5.01it/s]
    469/499      0.206G      0.01843    0.007305    0.01937          2          320:
57%|#####7     | 23/40 [00:04<00:03,  5.01it/s]
    469/499      0.206G      0.01843    0.007305    0.01937          2          320:
60%|######     | 24/40 [00:04<00:03,  4.98it/s]
    469/499      0.206G      0.01851    0.007297    0.01944          2          320:
60%|######     | 24/40 [00:04<00:03,  4.98it/s]
    469/499      0.206G      0.01851    0.007297    0.01944          2          320:
62%|######2    | 25/40 [00:04<00:02,  5.07it/s]
    469/499      0.206G      0.01846    0.007203    0.01954          2          320:
62%|######2    | 25/40 [00:04<00:02,  5.07it/s]
    469/499      0.206G      0.01846    0.007203    0.01954          2          320:
65%|######5    | 26/40 [00:04<00:02,  5.14it/s]
    469/499      0.206G      0.01805    0.007086    0.01957          1          320:
65%|######5    | 26/40 [00:05<00:02,  5.14it/s]
    469/499      0.206G      0.01805    0.007086    0.01957          1          320:
68%|######7    | 27/40 [00:05<00:02,  5.07it/s]
    469/499      0.206G      0.01771    0.007034    0.01938          2          320:
68%|######7    | 27/40 [00:05<00:02,  5.07it/s]
    469/499      0.206G      0.01771    0.007034    0.01938          2          320:
70%|#######    | 28/40 [00:05<00:02,  5.02it/s]
    469/499      0.206G      0.01738    0.006889    0.01929          1          320:
70%|#######    | 28/40 [00:05<00:02,  5.02it/s]
    469/499      0.206G      0.01738    0.006889    0.01929          1          320:
72%|#######2   | 29/40 [00:05<00:02,  4.99it/s]
    469/499      0.206G      0.0176     0.007083    0.01925          4          320:
```

```
72%|#######2  | 29/40 [00:05<00:02,  4.99it/s]
     469/499     0.206G     0.0176    0.007083     0.01925          4        320:
75%|#######5  | 30/40 [00:05<00:02,  4.86it/s]
     469/499     0.206G    0.01735    0.007203     0.01904          2        320:
75%|#######5  | 30/40 [00:05<00:02,  4.86it/s]
     469/499     0.206G    0.01735    0.007203     0.01904          2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.11it/s]
     469/499     0.206G    0.01845    0.007332     0.01918          2        320:
78%|#######7  | 31/40 [00:06<00:01,  5.11it/s]
     469/499     0.206G    0.01845    0.007332     0.01918          2        320:
80%|########  | 32/40 [00:06<00:01,  4.84it/s]
     469/499     0.206G    0.01848     0.00724     0.01903          1        320:
80%|########  | 32/40 [00:06<00:01,  4.84it/s]
     469/499     0.206G    0.01848     0.00724     0.01903          1        320:
82%|########2 | 33/40 [00:06<00:01,  5.18it/s]
     469/499     0.206G     0.0182    0.007128     0.01877          1        320:
82%|########2 | 33/40 [00:06<00:01,  5.18it/s]
     469/499     0.206G     0.0182    0.007128     0.01877          1        320:
85%|########5 | 34/40 [00:06<00:01,  5.36it/s]
     469/499     0.206G    0.01903    0.007141     0.01864          2        320:
85%|########5 | 34/40 [00:06<00:01,  5.36it/s]
     469/499     0.206G    0.01903    0.007141     0.01864          2        320:
88%|########7 | 35/40 [00:06<00:00,  5.47it/s]
     469/499     0.206G    0.01878    0.007054     0.01863          2        320:
88%|########7 | 35/40 [00:06<00:00,  5.47it/s]
     469/499     0.206G    0.01878    0.007054     0.01863          2        320:
90%|######### | 36/40 [00:06<00:00,  5.57it/s]
     469/499     0.206G    0.01882    0.007349     0.01859          4        320:
90%|######### | 36/40 [00:07<00:00,  5.57it/s]
     469/499     0.206G    0.01882    0.007349     0.01859          4        320:
92%|#########2| 37/40 [00:07<00:00,  5.31it/s]
     469/499     0.206G    0.01882    0.007444     0.01867          4        320:
92%|#########2| 37/40 [00:07<00:00,  5.31it/s]
     469/499     0.206G    0.01882    0.007444     0.01867          4        320:
95%|#########5| 38/40 [00:07<00:00,  5.24it/s]
     469/499     0.206G    0.01865    0.007335     0.01852          1        320:
95%|#########5| 38/40 [00:07<00:00,  5.24it/s]
     469/499     0.206G    0.01865    0.007335     0.01852          1        320:
98%|#########7| 39/40 [00:07<00:00,  5.37it/s]
     469/499     0.206G    0.01855    0.007467     0.01888          4        320:
98%|#########7| 39/40 [00:07<00:00,  5.37it/s]
     469/499     0.206G    0.01855    0.007467     0.01888          4        320:
100%|##########| 40/40 [00:07<00:00,  5.36it/s]
     469/499     0.206G    0.01855    0.007467     0.01888          4        320:
100%|##########| 40/40 [00:07<00:00,  5.27it/s]

              Class      Images  Instances          P          R       mAP50
mAP50-95:   0%|             | 0/20 [00:00<?, ?it/s]
```

217

```
              Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 14.16it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 16.26it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 16.14it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 16.92it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 17.39it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 17.68it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 17.87it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 17.23it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.55it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.84it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.98it/s]
                all        40         40      0.985      0.975      0.993
0.807


      Epoch    GPU_mem    box_loss   obj_loss   cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
    470/499    0.206G     0.00934   0.004615     0.0144          1        320:
0%|          | 0/40 [00:00<?, ?it/s]
    470/499    0.206G     0.00934   0.004615     0.0144          1        320:
2%|2          | 1/40 [00:00<00:06,  6.40it/s]
    470/499    0.206G    0.009674   0.004146    0.01384          1        320:
2%|2          | 1/40 [00:00<00:06,  6.40it/s]
    470/499    0.206G    0.009674   0.004146    0.01384          1        320:
5%|5          | 2/40 [00:00<00:06,  5.64it/s]
    470/499    0.206G     0.01374   0.007764    0.01545          4        320:
5%|5          | 2/40 [00:00<00:06,  5.64it/s]
    470/499    0.206G     0.01374   0.007764    0.01545          4        320:
8%|7          | 3/40 [00:00<00:06,  5.55it/s]
    470/499    0.206G     0.01414   0.006726    0.01537          1        320:
8%|7          | 3/40 [00:00<00:06,  5.55it/s]
    470/499    0.206G     0.01414   0.006726    0.01537          1        320:
10%|#          | 4/40 [00:00<00:06,  5.65it/s]
    470/499    0.206G     0.01337   0.006479    0.01502          1        320:
10%|#          | 4/40 [00:00<00:06,  5.65it/s]
    470/499    0.206G     0.01337   0.006479    0.01502          1        320:
12%|#2         | 5/40 [00:00<00:05,  5.86it/s]
```

```
     470/499      0.206G    0.01453   0.006377    0.01465          1          320:
12%|#2          | 5/40 [00:01<00:05,  5.86it/s]
     470/499      0.206G    0.01453   0.006377    0.01465          1          320:
15%|#5          | 6/40 [00:01<00:05,  5.84it/s]
     470/499      0.206G    0.01422   0.006068     0.0148          1          320:
15%|#5          | 6/40 [00:01<00:05,  5.84it/s]
     470/499      0.206G    0.01422   0.006068     0.0148          1          320:
18%|#7          | 7/40 [00:01<00:05,  6.02it/s]
     470/499      0.206G    0.01597   0.005756    0.01463          1          320:
18%|#7          | 7/40 [00:01<00:05,  6.02it/s]
     470/499      0.206G    0.01597   0.005756    0.01463          1          320:
20%|##          | 8/40 [00:01<00:05,  5.77it/s]
     470/499      0.206G     0.0166   0.006126    0.01469          2          320:
20%|##          | 8/40 [00:01<00:05,  5.77it/s]
     470/499      0.206G     0.0166   0.006126    0.01469          2          320:
22%|##2         | 9/40 [00:01<00:05,  5.63it/s]
     470/499      0.206G    0.01718   0.006632    0.01539          4          320:
22%|##2         | 9/40 [00:01<00:05,  5.63it/s]
     470/499      0.206G    0.01718   0.006632    0.01539          4          320:
25%|##5         | 10/40 [00:01<00:05,  5.68it/s]
     470/499      0.206G     0.0188     0.0068    0.01634          2          320:
25%|##5         | 10/40 [00:01<00:05,  5.68it/s]
     470/499      0.206G     0.0188     0.0068    0.01634          2          320:
28%|##7         | 11/40 [00:01<00:05,  5.57it/s]
     470/499      0.206G    0.01797   0.006464    0.01633          1          320:
28%|##7         | 11/40 [00:02<00:05,  5.57it/s]
     470/499      0.206G    0.01797   0.006464    0.01633          1          320:
30%|###         | 12/40 [00:02<00:04,  5.64it/s]
     470/499      0.206G    0.01953   0.006871    0.01702          2          320:
30%|###         | 12/40 [00:02<00:04,  5.64it/s]
     470/499      0.206G    0.01953   0.006871    0.01702          2          320:
32%|###2        | 13/40 [00:02<00:04,  5.40it/s]
     470/499      0.206G     0.0196   0.006879    0.01807          2          320:
32%|###2        | 13/40 [00:02<00:04,  5.40it/s]
     470/499      0.206G     0.0196   0.006879    0.01807          2          320:
35%|###5        | 14/40 [00:02<00:04,  5.49it/s]
     470/499      0.206G    0.01967    0.00687    0.01817          1          320:
35%|###5        | 14/40 [00:02<00:04,  5.49it/s]
     470/499      0.206G    0.01967    0.00687    0.01817          1          320:
38%|###7        | 15/40 [00:02<00:04,  5.44it/s]
     470/499      0.206G    0.01998   0.006887    0.01829          2          320:
38%|###7        | 15/40 [00:02<00:04,  5.44it/s]
     470/499      0.206G    0.01998   0.006887    0.01829          2          320:
40%|####        | 16/40 [00:02<00:04,  5.40it/s]
     470/499      0.206G    0.02054   0.007216    0.01864          4          320:
40%|####        | 16/40 [00:03<00:04,  5.40it/s]
     470/499      0.206G    0.02054   0.007216    0.01864          4          320:
42%|####2       | 17/40 [00:03<00:04,  5.52it/s]
```

```
    470/499      0.206G      0.02109    0.007666      0.01892          4          320:
42%|####2     | 17/40 [00:03<00:04,  5.52it/s]
    470/499      0.206G      0.02109    0.007666      0.01892          4          320:
45%|####5     | 18/40 [00:03<00:03,  5.60it/s]
    470/499      0.206G        0.021    0.007986      0.01884          4          320:
45%|####5     | 18/40 [00:03<00:03,  5.60it/s]
    470/499      0.206G        0.021    0.007986      0.01884          4          320:
48%|####7     | 19/40 [00:03<00:03,  5.35it/s]
    470/499      0.206G      0.02028    0.007712      0.01844          1          320:
48%|####7     | 19/40 [00:03<00:03,  5.35it/s]
    470/499      0.206G      0.02028    0.007712      0.01844          1          320:
50%|#####     | 20/40 [00:03<00:03,  5.10it/s]
    470/499      0.206G      0.01974    0.007472      0.01831          1          320:
50%|#####     | 20/40 [00:03<00:03,  5.10it/s]
    470/499      0.206G      0.01974    0.007472      0.01831          1          320:
52%|#####2    | 21/40 [00:03<00:03,  5.43it/s]
    470/499      0.206G      0.02049    0.007802      0.01857          3          320:
52%|#####2    | 21/40 [00:03<00:03,  5.43it/s]
    470/499      0.206G      0.02049    0.007802      0.01857          3          320:
55%|#####5    | 22/40 [00:03<00:03,  5.26it/s]
    470/499      0.206G      0.02102     0.00782      0.01879          3          320:
55%|#####5    | 22/40 [00:04<00:03,  5.26it/s]
    470/499      0.206G      0.02102     0.00782      0.01879          3          320:
57%|#####7    | 23/40 [00:04<00:03,  5.41it/s]
    470/499      0.206G      0.02061    0.007647      0.01852          1          320:
57%|#####7    | 23/40 [00:04<00:03,  5.41it/s]
    470/499      0.206G      0.02061    0.007647      0.01852          1          320:
60%|######    | 24/40 [00:04<00:02,  5.52it/s]
    470/499      0.206G      0.02034    0.007691      0.01825          2          320:
60%|######    | 24/40 [00:04<00:02,  5.52it/s]
    470/499      0.206G      0.02034    0.007691      0.01825          2          320:
62%|######2   | 25/40 [00:04<00:02,  5.61it/s]
    470/499      0.206G      0.02011     0.00755      0.01814          1          320:
62%|######2   | 25/40 [00:04<00:02,  5.61it/s]
    470/499      0.206G      0.02011     0.00755      0.01814          1          320:
65%|######5   | 26/40 [00:04<00:02,  5.52it/s]
    470/499      0.206G      0.01997    0.007778      0.01812          4          320:
65%|######5   | 26/40 [00:04<00:02,  5.52it/s]
    470/499      0.206G      0.01997    0.007778      0.01812          4          320:
68%|######7   | 27/40 [00:04<00:02,  5.61it/s]
    470/499      0.206G      0.02012    0.007729      0.01843          2          320:
68%|######7   | 27/40 [00:05<00:02,  5.61it/s]
    470/499      0.206G      0.02012    0.007729      0.01843          2          320:
70%|#######   | 28/40 [00:05<00:02,  5.49it/s]
    470/499      0.206G      0.01975     0.00768      0.01833          2          320:
70%|#######   | 28/40 [00:05<00:02,  5.49it/s]
    470/499      0.206G      0.01975     0.00768      0.01833          2          320:
72%|#######2  | 29/40 [00:05<00:01,  5.59it/s]
```

```
     470/499      0.206G      0.01992     0.008072     0.01835          4           320:
72%|#######2  | 29/40 [00:05<00:01,  5.59it/s]
     470/499      0.206G      0.01992     0.008072     0.01835          4           320:
75%|#######5  | 30/40 [00:05<00:01,  5.37it/s]
     470/499      0.206G      0.01952     0.00799      0.01833          2           320:
75%|#######5  | 30/40 [00:05<00:01,  5.37it/s]
     470/499      0.206G      0.01952     0.00799      0.01833          2           320:
78%|#######7  | 31/40 [00:05<00:01,  5.47it/s]
     470/499      0.206G      0.02021     0.008285     0.01858          4           320:
78%|#######7  | 31/40 [00:05<00:01,  5.47it/s]
     470/499      0.206G      0.02021     0.008285     0.01858          4           320:
80%|########  | 32/40 [00:05<00:01,  5.57it/s]
     470/499      0.206G      0.02073     0.008411     0.01856          4           320:
80%|########  | 32/40 [00:05<00:01,  5.57it/s]
     470/499      0.206G      0.02073     0.008411     0.01856          4           320:
82%|########2 | 33/40 [00:05<00:01,  5.49it/s]
     470/499      0.206G      0.02043     0.008273     0.01846          1           320:
82%|########2 | 33/40 [00:06<00:01,  5.49it/s]
     470/499      0.206G      0.02043     0.008273     0.01846          1           320:
85%|########5 | 34/40 [00:06<00:01,  5.58it/s]
     470/499      0.206G      0.02038     0.008272     0.01832          2           320:
85%|########5 | 34/40 [00:06<00:01,  5.58it/s]
     470/499      0.206G      0.02038     0.008272     0.01832          2           320:
88%|########7 | 35/40 [00:06<00:00,  5.51it/s]
     470/499      0.206G      0.02013     0.008149     0.01822          1           320:
88%|########7 | 35/40 [00:06<00:00,  5.51it/s]
     470/499      0.206G      0.02013     0.008149     0.01822          1           320:
90%|######### | 36/40 [00:06<00:00,  5.60it/s]
     470/499      0.206G      0.02014      0.0083      0.01819          4           320:
90%|######### | 36/40 [00:06<00:00,  5.60it/s]
     470/499      0.206G      0.02014      0.0083      0.01819          4           320:
92%|#########2| 37/40 [00:06<00:00,  5.36it/s]
     470/499      0.206G      0.02063      0.0086      0.01841          4           320:
92%|#########2| 37/40 [00:06<00:00,  5.36it/s]
     470/499      0.206G      0.02063      0.0086      0.01841          4           320:
95%|#########5| 38/40 [00:06<00:00,  5.35it/s]
     470/499      0.206G      0.02042     0.008531     0.01834          1           320:
95%|#########5| 38/40 [00:07<00:00,  5.35it/s]
     470/499      0.206G      0.02042     0.008531     0.01834          1           320:
98%|#########7| 39/40 [00:07<00:00,  5.34it/s]
     470/499      0.206G      0.02018     0.008439     0.01834          2           320:
98%|#########7| 39/40 [00:07<00:00,  5.34it/s]
     470/499      0.206G      0.02018     0.008439     0.01834          2           320:
100%|##########| 40/40 [00:07<00:00,  5.47it/s]
     470/499      0.206G      0.02018     0.008439     0.01834          2           320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]

                 Class      Images   Instances           P           R       mAP50
```

```
mAP50-95:    0%|              | 0/20 [00:00<?, ?it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:   10%|#           | 2/20 [00:00<00:00, 18.28it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:   20%|##          | 4/20 [00:00<00:00, 18.28it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:   30%|###         | 6/20 [00:00<00:00, 18.28it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:   40%|####        | 8/20 [00:00<00:00, 18.12it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:   50%|#####       | 10/20 [00:00<00:00, 15.76it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:   60%|######      | 12/20 [00:00<00:00, 16.52it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:   70%|#######     | 14/20 [00:00<00:00, 16.35it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:   80%|########    | 16/20 [00:00<00:00, 16.79it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:   95%|#########5| 19/20 [00:01<00:00, 17.69it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:  100%|##########| 20/20 [00:01<00:00, 17.45it/s]
                  all          40          40       0.98      0.975      0.992
0.791

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|             | 0/40 [00:00<?, ?it/s]
     471/499     0.206G    0.05054   0.008832    0.04122          2        320:
0%|            | 0/40 [00:00<?, ?it/s]
     471/499     0.206G    0.05054   0.008832    0.04122          2        320:
2%|2           | 1/40 [00:00<00:06,  5.84it/s]
     471/499     0.206G    0.03599   0.007212    0.02763          1        320:
2%|2           | 1/40 [00:00<00:06,  5.84it/s]
     471/499     0.206G    0.03599   0.007212    0.02763          1        320:
5%|5           | 2/40 [00:00<00:06,  5.83it/s]
     471/499     0.206G    0.03049   0.006985    0.02374          2        320:
5%|5           | 2/40 [00:00<00:06,  5.83it/s]
     471/499     0.206G    0.03049   0.006985    0.02374          2        320:
8%|7           | 3/40 [00:00<00:06,  5.56it/s]
     471/499     0.206G    0.02577   0.006171    0.02197          1        320:
8%|7           | 3/40 [00:00<00:06,  5.56it/s]
     471/499     0.206G    0.02577   0.006171    0.02197          1        320:
10%|#           | 4/40 [00:00<00:06,  5.66it/s]
     471/499     0.206G     0.0262    0.00769     0.0212          4        320:
10%|#           | 4/40 [00:00<00:06,  5.66it/s]
     471/499     0.206G     0.0262    0.00769     0.0212          4        320:
12%|#2          | 5/40 [00:00<00:06,  5.72it/s]
     471/499     0.206G    0.02531   0.008819    0.02054          4        320:
```

```
12%|#2           | 5/40 [00:01<00:06,  5.72it/s]
    471/499      0.206G     0.02531    0.008819    0.02054         4         320:
15%|#5           | 6/40 [00:01<00:06,  5.42it/s]
    471/499      0.206G     0.02423    0.01009      0.0197         4         320:
15%|#5           | 6/40 [00:01<00:06,  5.42it/s]
    471/499      0.206G     0.02423    0.01009      0.0197         4         320:
18%|#7           | 7/40 [00:01<00:06,  4.98it/s]
    471/499      0.206G     0.02366    0.01011     0.01995         2         320:
18%|#7           | 7/40 [00:01<00:06,  4.98it/s]
    471/499      0.206G     0.02366    0.01011     0.01995         2         320:
20%|##           | 8/40 [00:01<00:06,  4.94it/s]
    471/499      0.206G     0.02376    0.01088     0.02071         4         320:
20%|##           | 8/40 [00:01<00:06,  4.94it/s]
    471/499      0.206G     0.02376    0.01088     0.02071         4         320:
22%|##2          | 9/40 [00:01<00:06,  4.82it/s]
    471/499      0.206G     0.02336    0.01106     0.02056         4         320:
22%|##2          | 9/40 [00:01<00:06,  4.82it/s]
    471/499      0.206G     0.02336    0.01106     0.02056         4         320:
25%|##5          | 10/40 [00:01<00:06,  4.97it/s]
    471/499      0.206G     0.02214     0.0105     0.02008         1         320:
25%|##5          | 10/40 [00:02<00:06,  4.97it/s]
    471/499      0.206G     0.02214     0.0105     0.02008         1         320:
28%|##7          | 11/40 [00:02<00:05,  4.93it/s]
    471/499      0.206G     0.02133    0.01018     0.02033         2         320:
28%|##7          | 11/40 [00:02<00:05,  4.93it/s]
    471/499      0.206G     0.02133    0.01018     0.02033         2         320:
30%|###          | 12/40 [00:02<00:05,  4.93it/s]
    471/499      0.206G      0.0204    0.009605    0.01975         1         320:
30%|###          | 12/40 [00:02<00:05,  4.93it/s]
    471/499      0.206G      0.0204    0.009605    0.01975         1         320:
32%|###2         | 13/40 [00:02<00:05,  5.13it/s]
    471/499      0.206G     0.02003    0.009434    0.01925         2         320:
32%|###2         | 13/40 [00:02<00:05,  5.13it/s]
    471/499      0.206G     0.02003    0.009434    0.01925         2         320:
35%|###5         | 14/40 [00:02<00:05,  5.07it/s]
    471/499      0.206G     0.01982     0.00943    0.02002         4         320:
35%|###5         | 14/40 [00:02<00:05,  5.07it/s]
    471/499      0.206G     0.01982     0.00943    0.02002         4         320:
38%|###7         | 15/40 [00:02<00:04,  5.15it/s]
    471/499      0.206G     0.01954     0.00923    0.01942         1         320:
38%|###7         | 15/40 [00:03<00:04,  5.15it/s]
    471/499      0.206G     0.01954     0.00923    0.01942         1         320:
40%|####         | 16/40 [00:03<00:04,  5.08it/s]
    471/499      0.206G      0.0195    0.009506    0.01954         4         320:
40%|####         | 16/40 [00:03<00:04,  5.08it/s]
    471/499      0.206G      0.0195    0.009506    0.01954         4         320:
42%|####2        | 17/40 [00:03<00:04,  5.02it/s]
    471/499      0.206G     0.02061    0.009406    0.01961         2         320:
```

```
42%|####2      | 17/40 [00:03<00:04,  5.02it/s]
    471/499    0.206G    0.02061   0.009406   0.01961        2        320:
45%|####5      | 18/40 [00:03<00:04,  4.99it/s]
    471/499    0.206G    0.02027   0.00972    0.01938        4        320:
45%|####5      | 18/40 [00:03<00:04,  4.99it/s]
    471/499    0.206G    0.02027   0.00972    0.01938        4        320:
48%|####7      | 19/40 [00:03<00:04,  4.97it/s]
    471/499    0.206G    0.02026   0.01009    0.0197         4        320:
48%|####7      | 19/40 [00:03<00:04,  4.97it/s]
    471/499    0.206G    0.02026   0.01009    0.0197         4        320:
50%|#####      | 20/40 [00:03<00:04,  4.73it/s]
    471/499    0.206G    0.02061   0.01024    0.01969        4        320:
50%|#####      | 20/40 [00:04<00:04,  4.73it/s]
    471/499    0.206G    0.02061   0.01024    0.01969        4        320:
52%|#####2     | 21/40 [00:04<00:03,  4.90it/s]
    471/499    0.206G    0.02045   0.01035    0.01989        4        320:
52%|#####2     | 21/40 [00:04<00:03,  4.90it/s]
    471/499    0.206G    0.02045   0.01035    0.01989        4        320:
55%|#####5     | 22/40 [00:04<00:03,  5.01it/s]
    471/499    0.206G    0.02072   0.01037    0.01988        3        320:
55%|#####5     | 22/40 [00:04<00:03,  5.01it/s]
    471/499    0.206G    0.02072   0.01037    0.01988        3        320:
57%|#####7     | 23/40 [00:04<00:03,  5.10it/s]
    471/499    0.206G    0.0204    0.01006    0.0197         1        320:
57%|#####7     | 23/40 [00:04<00:03,  5.10it/s]
    471/499    0.206G    0.0204    0.01006    0.0197         1        320:
60%|######     | 24/40 [00:04<00:03,  5.16it/s]
    471/499    0.206G    0.01987   0.009831   0.01943        1        320:
60%|######     | 24/40 [00:04<00:03,  5.16it/s]
    471/499    0.206G    0.01987   0.009831   0.01943        1        320:
62%|######2    | 25/40 [00:04<00:02,  5.33it/s]
    471/499    0.206G    0.01944   0.009584   0.01921        1        320:
62%|######2    | 25/40 [00:05<00:02,  5.33it/s]
    471/499    0.206G    0.01944   0.009584   0.01921        1        320:
65%|######5    | 26/40 [00:05<00:02,  5.33it/s]
    471/499    0.206G    0.01917   0.00935    0.01903        1        320:
65%|######5    | 26/40 [00:05<00:02,  5.33it/s]
    471/499    0.206G    0.01917   0.00935    0.01903        1        320:
68%|######7    | 27/40 [00:05<00:02,  5.32it/s]
    471/499    0.206G    0.02048   0.009358   0.01902        3        320:
68%|######7    | 27/40 [00:05<00:02,  5.32it/s]
    471/499    0.206G    0.02048   0.009358   0.01902        3        320:
70%|#######    | 28/40 [00:05<00:02,  5.31it/s]
    471/499    0.206G    0.02041   0.009446   0.01895        4        320:
70%|#######    | 28/40 [00:05<00:02,  5.31it/s]
    471/499    0.206G    0.02041   0.009446   0.01895        4        320:
72%|#######2   | 29/40 [00:05<00:02,  5.20it/s]
    471/499    0.206G    0.02042   0.009605   0.01894        4        320:
```

```
72%|#######2  | 29/40 [00:05<00:02,  5.20it/s]
    471/499      0.206G     0.02042    0.009605     0.01894        4        320:
75%|#######5  | 30/40 [00:05<00:01,  5.35it/s]
    471/499      0.206G     0.02115    0.009662     0.01916        2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.35it/s]
    471/499      0.206G     0.02115    0.009662     0.01916        2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.48it/s]
    471/499      0.206G     0.02192    0.009595      0.0191        2        320:
78%|#######7  | 31/40 [00:06<00:01,  5.48it/s]
    471/499      0.206G     0.02192    0.009595      0.0191        2        320:
80%|########  | 32/40 [00:06<00:01,  5.44it/s]
    471/499      0.206G     0.02319    0.009485      0.0191        2        320:
80%|########  | 32/40 [00:06<00:01,  5.44it/s]
    471/499      0.206G     0.02319    0.009485      0.0191        2        320:
82%|########2 | 33/40 [00:06<00:01,  5.54it/s]
    471/499      0.206G     0.02288    0.009406     0.01946        2        320:
82%|########2 | 33/40 [00:06<00:01,  5.54it/s]
    471/499      0.206G     0.02288    0.009406     0.01946        2        320:
85%|########5 | 34/40 [00:06<00:01,  5.34it/s]
    471/499      0.206G     0.02277    0.009558     0.01946        4        320:
85%|########5 | 34/40 [00:06<00:01,  5.34it/s]
    471/499      0.206G     0.02277    0.009558     0.01946        4        320:
88%|########7 | 35/40 [00:06<00:00,  5.34it/s]
    471/499      0.206G     0.02258     0.00948     0.01933        2        320:
88%|########7 | 35/40 [00:06<00:00,  5.34it/s]
    471/499      0.206G     0.02258     0.00948     0.01933        2        320:
90%|######### | 36/40 [00:06<00:00,  5.59it/s]
    471/499      0.206G     0.02265    0.009423     0.01926        2        320:
90%|######### | 36/40 [00:07<00:00,  5.59it/s]
    471/499      0.206G     0.02265    0.009423     0.01926        2        320:
92%|#########2| 37/40 [00:07<00:00,  5.66it/s]
    471/499      0.206G     0.02244    0.009252     0.01924        1        320:
92%|#########2| 37/40 [00:07<00:00,  5.66it/s]
    471/499      0.206G     0.02244    0.009252     0.01924        1        320:
95%|#########5| 38/40 [00:07<00:00,  5.70it/s]
    471/499      0.206G     0.02202    0.009102     0.01917        1        320:
95%|#########5| 38/40 [00:07<00:00,  5.70it/s]
    471/499      0.206G     0.02202    0.009102     0.01917        1        320:
98%|#########7| 39/40 [00:07<00:00,  5.87it/s]
    471/499      0.206G     0.02199    0.009018     0.01903        2        320:
98%|#########7| 39/40 [00:07<00:00,  5.87it/s]
    471/499      0.206G     0.02199    0.009018     0.01903        2        320:
100%|##########| 40/40 [00:07<00:00,  5.70it/s]
    471/499      0.206G     0.02199    0.009018     0.01903        2        320:
100%|##########| 40/40 [00:07<00:00,  5.27it/s]

             Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
```

225

```
              Class     Images  Instances          P           R       mAP50
mAP50-95:  10%|#         | 2/20 [00:00<00:01, 16.00it/s]
              Class     Images  Instances          P           R       mAP50
mAP50-95:  20%|##        | 4/20 [00:00<00:01, 16.00it/s]
              Class     Images  Instances          P           R       mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 15.01it/s]
              Class     Images  Instances          P           R       mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 15.39it/s]
              Class     Images  Instances          P           R       mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 15.60it/s]
              Class     Images  Instances          P           R       mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 15.10it/s]
              Class     Images  Instances          P           R       mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 15.96it/s]
              Class     Images  Instances          P           R       mAP50
mAP50-95:  80%|########  | 16/20 [00:01<00:00, 16.64it/s]
              Class     Images  Instances          P           R       mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.12it/s]
              Class     Images  Instances          P           R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.57it/s]
                all        40         40       0.98       0.975       0.992
0.791

      Epoch     GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    472/499     0.206G   0.005587   0.002557    0.01384          1        320:
0%|           | 0/40 [00:00<?, ?it/s]
    472/499     0.206G   0.005587   0.002557    0.01384          1        320:
2%|2          | 1/40 [00:00<00:06,  5.81it/s]
    472/499     0.206G   0.008506   0.004682     0.0164          2        320:
2%|2          | 1/40 [00:00<00:06,  5.81it/s]
    472/499     0.206G   0.008506   0.004682     0.0164          2        320:
5%|5          | 2/40 [00:00<00:06,  5.76it/s]
    472/499     0.206G    0.01017   0.004171    0.01317          1        320:
5%|5          | 2/40 [00:00<00:06,  5.76it/s]
    472/499     0.206G    0.01017   0.004171    0.01317          1        320:
8%|7          | 3/40 [00:00<00:06,  6.04it/s]
    472/499     0.206G   0.009686   0.003894    0.01413          1        320:
8%|7          | 3/40 [00:00<00:06,  6.04it/s]
    472/499     0.206G   0.009686   0.003894    0.01413          1        320:
10%|#          | 4/40 [00:00<00:06,  5.54it/s]
    472/499     0.206G    0.01082   0.004833    0.01542          2        320:
10%|#          | 4/40 [00:00<00:06,  5.54it/s]
    472/499     0.206G    0.01082   0.004833    0.01542          2        320:
12%|#2         | 5/40 [00:00<00:06,  5.62it/s]
    472/499     0.206G    0.01029   0.004464    0.01481          1        320:
12%|#2         | 5/40 [00:01<00:06,  5.62it/s]
```

```
    472/499      0.206G     0.01029    0.004464     0.01481          1        320:
15%|#5          | 6/40 [00:01<00:06,  5.36it/s]
    472/499      0.206G      0.0115    0.00429      0.01506          1        320:
15%|#5          | 6/40 [00:01<00:06,  5.36it/s]
    472/499      0.206G      0.0115    0.00429      0.01506          1        320:
18%|#7          | 7/40 [00:01<00:05,  5.66it/s]
    472/499      0.206G     0.01278    0.004892     0.01872          2        320:
18%|#7          | 7/40 [00:01<00:05,  5.66it/s]
    472/499      0.206G     0.01278    0.004892     0.01872          2        320:
20%|##          | 8/40 [00:01<00:05,  5.35it/s]
    472/499      0.206G     0.01434    0.004958     0.01866          1        320:
20%|##          | 8/40 [00:01<00:05,  5.35it/s]
    472/499      0.206G     0.01434    0.004958     0.01866          1        320:
22%|##2         | 9/40 [00:01<00:05,  5.66it/s]
    472/499      0.206G     0.01384    0.005019     0.01885          1        320:
22%|##2         | 9/40 [00:01<00:05,  5.66it/s]
    472/499      0.206G     0.01384    0.005019     0.01885          1        320:
25%|##5         | 10/40 [00:01<00:05,  5.70it/s]
    472/499      0.206G     0.01336    0.004945     0.01818          1        320:
25%|##5         | 10/40 [00:01<00:05,  5.70it/s]
    472/499      0.206G     0.01336    0.004945     0.01818          1        320:
28%|##7         | 11/40 [00:01<00:05,  5.49it/s]
    472/499      0.206G      0.0157    0.005393     0.01837          4        320:
28%|##7         | 11/40 [00:02<00:05,  5.49it/s]
    472/499      0.206G      0.0157    0.005393     0.01837          4        320:
30%|###         | 12/40 [00:02<00:05,  5.52it/s]
    472/499      0.206G     0.01515    0.005368     0.01794          1        320:
30%|###         | 12/40 [00:02<00:05,  5.52it/s]
    472/499      0.206G     0.01515    0.005368     0.01794          1        320:
32%|###2        | 13/40 [00:02<00:04,  5.61it/s]
    472/499      0.206G     0.01623    0.006051     0.01903          4        320:
32%|###2        | 13/40 [00:02<00:04,  5.61it/s]
    472/499      0.206G     0.01623    0.006051     0.01903          4        320:
35%|###5        | 14/40 [00:02<00:04,  5.39it/s]
    472/499      0.206G     0.01702    0.006695      0.0194          4        320:
35%|###5        | 14/40 [00:02<00:04,  5.39it/s]
    472/499      0.206G     0.01702    0.006695      0.0194          4        320:
38%|###7        | 15/40 [00:02<00:04,  5.51it/s]
    472/499      0.206G      0.0167    0.006474      0.0192          1        320:
38%|###7        | 15/40 [00:02<00:04,  5.51it/s]
    472/499      0.206G      0.0167    0.006474      0.0192          1        320:
40%|####        | 16/40 [00:02<00:04,  5.60it/s]
    472/499      0.206G     0.01635    0.006507     0.01881          2        320:
40%|####        | 16/40 [00:03<00:04,  5.60it/s]
    472/499      0.206G     0.01635    0.006507     0.01881          2        320:
42%|####2       | 17/40 [00:03<00:04,  5.50it/s]
    472/499      0.206G     0.01589    0.006507     0.01858          2        320:
42%|####2       | 17/40 [00:03<00:04,  5.50it/s]
```

227

```
     472/499        0.206G      0.01589    0.006507      0.01858           2          320:
45%|####5      | 18/40 [00:03<00:03,  5.74it/s]
     472/499        0.206G      0.01611    0.006953      0.01848           2          320:
45%|####5      | 18/40 [00:03<00:03,  5.74it/s]
     472/499        0.206G      0.01611    0.006953      0.01848           2          320:
48%|####7      | 19/40 [00:03<00:03,  5.61it/s]
     472/499        0.206G      0.01561    0.006722      0.01811           1          320:
48%|####7      | 19/40 [00:03<00:03,  5.61it/s]
     472/499        0.206G      0.01561    0.006722      0.01811           1          320:
50%|#####      | 20/40 [00:03<00:03,  5.65it/s]
     472/499        0.206G      0.01529    0.006697      0.01814           2          320:
50%|#####      | 20/40 [00:03<00:03,  5.65it/s]
     472/499        0.206G      0.01529    0.006697      0.01814           2          320:
52%|#####2     | 21/40 [00:03<00:03,  5.70it/s]
     472/499        0.206G      0.01591    0.006779      0.01825           2          320:
52%|#####2     | 21/40 [00:03<00:03,  5.70it/s]
     472/499        0.206G      0.01591    0.006779      0.01825           2          320:
55%|#####5     | 22/40 [00:03<00:03,  5.30it/s]
     472/499        0.206G        0.017    0.007033      0.01875           2          320:
55%|#####5     | 22/40 [00:04<00:03,  5.30it/s]
     472/499        0.206G        0.017    0.007033      0.01875           2          320:
57%|#####7     | 23/40 [00:04<00:03,  5.43it/s]
     472/499        0.206G      0.01845    0.007124      0.01866           2          320:
57%|#####7     | 23/40 [00:04<00:03,  5.43it/s]
     472/499        0.206G      0.01845    0.007124      0.01866           2          320:
60%|######     | 24/40 [00:04<00:02,  5.40it/s]
     472/499        0.206G      0.01813    0.007055      0.01856           1          320:
60%|######     | 24/40 [00:04<00:02,  5.40it/s]
     472/499        0.206G      0.01813    0.007055      0.01856           1          320:
62%|######2    | 25/40 [00:04<00:02,  5.51it/s]
     472/499        0.206G      0.01782    0.006922      0.01842           1          320:
62%|######2    | 25/40 [00:04<00:02,  5.51it/s]
     472/499        0.206G      0.01782    0.006922      0.01842           1          320:
65%|######5    | 26/40 [00:04<00:02,  5.59it/s]
     472/499        0.206G      0.01747    0.006783      0.01846           1          320:
65%|######5    | 26/40 [00:04<00:02,  5.59it/s]
     472/499        0.206G      0.01747    0.006783      0.01846           1          320:
68%|######7    | 27/40 [00:04<00:02,  5.66it/s]
     472/499        0.206G      0.01721     0.00663      0.01816           1          320:
68%|######7    | 27/40 [00:05<00:02,  5.66it/s]
     472/499        0.206G      0.01721     0.00663      0.01816           1          320:
70%|#######    | 28/40 [00:05<00:02,  5.70it/s]
     472/499        0.206G      0.01728    0.006808      0.01815           4          320:
70%|#######    | 28/40 [00:05<00:02,  5.70it/s]
     472/499        0.206G      0.01728    0.006808      0.01815           4          320:
72%|#######2   | 29/40 [00:05<00:01,  5.58it/s]
     472/499        0.206G      0.01694    0.006697      0.01793           1          320:
72%|#######2   | 29/40 [00:05<00:01,  5.58it/s]
```

228

```
    472/499      0.206G      0.01694     0.006697     0.01793         1         320:
75%|#######5  | 30/40 [00:05<00:01,  5.81it/s]
    472/499      0.206G      0.01721     0.007131     0.01795         4         320:
75%|#######5  | 30/40 [00:05<00:01,  5.81it/s]
    472/499      0.206G      0.01721     0.007131     0.01795         4         320:
78%|#######7  | 31/40 [00:05<00:01,  5.66it/s]
    472/499      0.206G      0.01753     0.007321     0.01824         4         320:
78%|#######7  | 31/40 [00:05<00:01,  5.66it/s]
    472/499      0.206G      0.01753     0.007321     0.01824         4         320:
80%|########  | 32/40 [00:05<00:01,  5.54it/s]
    472/499      0.206G      0.01813     0.007555     0.01822         4         320:
80%|########  | 32/40 [00:05<00:01,  5.54it/s]
    472/499      0.206G      0.01813     0.007555     0.01822         4         320:
82%|########2 | 33/40 [00:05<00:01,  5.47it/s]
    472/499      0.206G      0.01773     0.007434     0.01809         1         320:
82%|########2 | 33/40 [00:06<00:01,  5.47it/s]
    472/499      0.206G      0.01773     0.007434     0.01809         1         320:
85%|########5 | 34/40 [00:06<00:01,  5.43it/s]
    472/499      0.206G      0.01759     0.007356     0.01807         1         320:
85%|########5 | 34/40 [00:06<00:01,  5.43it/s]
    472/499      0.206G      0.01759     0.007356     0.01807         1         320:
88%|########7 | 35/40 [00:06<00:00,  5.66it/s]
    472/499      0.206G      0.01759     0.007376     0.01824         2         320:
88%|########7 | 35/40 [00:06<00:00,  5.66it/s]
    472/499      0.206G      0.01759     0.007376     0.01824         2         320:
90%|######### | 36/40 [00:06<00:00,  5.71it/s]
    472/499      0.206G      0.01736     0.007449     0.01815         4         320:
90%|######### | 36/40 [00:06<00:00,  5.71it/s]
    472/499      0.206G      0.01736     0.007449     0.01815         4         320:
92%|#########2| 37/40 [00:06<00:00,  5.74it/s]
    472/499      0.206G      0.01719     0.007424     0.01829         2         320:
92%|#########2| 37/40 [00:06<00:00,  5.74it/s]
    472/499      0.206G      0.01719     0.007424     0.01829         2         320:
95%|#########5| 38/40 [00:06<00:00,  5.59it/s]
    472/499      0.206G      0.01761     0.007558     0.01825         4         320:
95%|#########5| 38/40 [00:07<00:00,  5.59it/s]
    472/499      0.206G      0.01761     0.007558     0.01825         4         320:
98%|#########7| 39/40 [00:07<00:00,  5.33it/s]
    472/499      0.206G      0.01756     0.007639     0.01835         4         320:
98%|#########7| 39/40 [00:07<00:00,  5.33it/s]
    472/499      0.206G      0.01756     0.007639     0.01835         4         320:
100%|##########| 40/40 [00:07<00:00,  5.37it/s]
    472/499      0.206G      0.01756     0.007639     0.01835         4         320:
100%|##########| 40/40 [00:07<00:00,  5.56it/s]

                Class     Images  Instances          P          R      mAP50
mAP50-95:    0%|          | 0/20 [00:00<?, ?it/s]
                Class     Images  Instances          P          R      mAP50
```

229

```
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 15.80it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 17.17it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 16.62it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 17.24it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 16.96it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 16.43it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 16.29it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 16.87it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.29it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.48it/s]
                Class      Images  Instances         P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.15it/s]
                  all         40         40       0.98      0.975      0.993
0.79

      Epoch    GPU_mem    box_loss    obj_loss    cls_loss   Instances      Size

  0%|            | 0/40 [00:00<?, ?it/s]
     473/499     0.206G     0.03503    0.008045      0.0316          3       320:
0%|            | 0/40 [00:00<?, ?it/s]
     473/499     0.206G     0.03503    0.008045      0.0316          3       320:
2%|2           | 1/40 [00:00<00:07,  5.44it/s]
     473/499     0.206G     0.02859    0.006243     0.02551          1       320:
2%|2           | 1/40 [00:00<00:07,  5.44it/s]
     473/499     0.206G     0.02859    0.006243     0.02551          1       320:
5%|5           | 2/40 [00:00<00:07,  5.12it/s]
     473/499     0.206G     0.02263    0.007833     0.02184          4       320:
5%|5           | 2/40 [00:00<00:07,  5.12it/s]
     473/499     0.206G     0.02263    0.007833     0.02184          4       320:
8%|7           | 3/40 [00:00<00:07,  5.19it/s]
     473/499     0.206G      0.0289    0.008884     0.02136          3       320:
8%|7           | 3/40 [00:00<00:07,  5.19it/s]
     473/499     0.206G      0.0289    0.008884     0.02136          3       320:
10%|#           | 4/40 [00:00<00:07,  5.08it/s]
     473/499     0.206G      0.0266     0.01011      0.0199          4       320:
10%|#           | 4/40 [00:00<00:07,  5.08it/s]
     473/499     0.206G      0.0266     0.01011      0.0199          4       320:
12%|#2          | 5/40 [00:00<00:07,  4.88it/s]
     473/499     0.206G     0.03051     0.01057      0.0199          4       320:
```

```
12%|#2          | 5/40 [00:01<00:07,  4.88it/s]
     473/499     0.206G     0.03051     0.01057     0.0199        4        320:
15%|#5          | 6/40 [00:01<00:06,  4.89it/s]
     473/499     0.206G     0.02749     0.009836    0.01929       2        320:
15%|#5          | 6/40 [00:01<00:06,  4.89it/s]
     473/499     0.206G     0.02749     0.009836    0.01929       2        320:
18%|#7          | 7/40 [00:01<00:06,  4.90it/s]
     473/499     0.206G     0.0253      0.009084    0.01875       1        320:
18%|#7          | 7/40 [00:01<00:06,  4.90it/s]
     473/499     0.206G     0.0253      0.009084    0.01875       1        320:
20%|##          | 8/40 [00:01<00:06,  4.91it/s]
     473/499     0.206G     0.02469     0.01026     0.01879       4        320:
20%|##          | 8/40 [00:01<00:06,  4.91it/s]
     473/499     0.206G     0.02469     0.01026     0.01879       4        320:
22%|##2         | 9/40 [00:01<00:06,  4.91it/s]
     473/499     0.206G     0.02434     0.01016     0.01938       2        320:
22%|##2         | 9/40 [00:01<00:06,  4.91it/s]
     473/499     0.206G     0.02434     0.01016     0.01938       2        320:
25%|##5         | 10/40 [00:01<00:05,  5.03it/s]
     473/499     0.206G     0.02297     0.009755    0.01897       2        320:
25%|##5         | 10/40 [00:02<00:05,  5.03it/s]
     473/499     0.206G     0.02297     0.009755    0.01897       2        320:
28%|##7         | 11/40 [00:02<00:05,  5.11it/s]
     473/499     0.206G     0.02227     0.009226    0.01878       1        320:
28%|##7         | 11/40 [00:02<00:05,  5.11it/s]
     473/499     0.206G     0.02227     0.009226    0.01878       1        320:
30%|###         | 12/40 [00:02<00:05,  5.30it/s]
     473/499     0.206G     0.02419     0.009316    0.0186        3        320:
30%|###         | 12/40 [00:02<00:05,  5.30it/s]
     473/499     0.206G     0.02419     0.009316    0.0186        3        320:
32%|###2        | 13/40 [00:02<00:05,  5.31it/s]
     473/499     0.206G     0.0251      0.01004     0.01852       4        320:
32%|###2        | 13/40 [00:02<00:05,  5.31it/s]
     473/499     0.206G     0.0251      0.01004     0.01852       4        320:
35%|###5        | 14/40 [00:02<00:04,  5.30it/s]
     473/499     0.206G     0.02467     0.01026     0.01876       4        320:
35%|###5        | 14/40 [00:02<00:04,  5.30it/s]
     473/499     0.206G     0.02467     0.01026     0.01876       4        320:
38%|###7        | 15/40 [00:02<00:04,  5.31it/s]
     473/499     0.206G     0.02406     0.01024     0.01871       2        320:
38%|###7        | 15/40 [00:03<00:04,  5.31it/s]
     473/499     0.206G     0.02406     0.01024     0.01871       2        320:
40%|####        | 16/40 [00:03<00:04,  5.32it/s]
     473/499     0.206G     0.02387     0.01071     0.01873       4        320:
40%|####        | 16/40 [00:03<00:04,  5.32it/s]
     473/499     0.206G     0.02387     0.01071     0.01873       4        320:
42%|####2       | 17/40 [00:03<00:04,  5.30it/s]
     473/499     0.206G     0.02341     0.01044     0.01845       1        320:
```

```
42%|####2        | 17/40 [00:03<00:04,  5.30it/s]
     473/499      0.206G     0.02341    0.01044    0.01845          1       320:
45%|####5        | 18/40 [00:03<00:04,  5.45it/s]
     473/499      0.206G      0.0243    0.01072    0.01881          3       320:
45%|####5        | 18/40 [00:03<00:04,  5.45it/s]
     473/499      0.206G      0.0243    0.01072    0.01881          3       320:
48%|####7        | 19/40 [00:03<00:03,  5.55it/s]
     473/499      0.206G     0.02605    0.01048    0.02026          2       320:
48%|####7        | 19/40 [00:03<00:03,  5.55it/s]
     473/499      0.206G     0.02605    0.01048    0.02026          2       320:
50%|#####        | 20/40 [00:03<00:03,  5.47it/s]
     473/499      0.206G     0.02541    0.01016    0.01986          1       320:
50%|#####        | 20/40 [00:04<00:03,  5.47it/s]
     473/499      0.206G     0.02541    0.01016    0.01986          1       320:
52%|#####2       | 21/40 [00:04<00:03,  5.57it/s]
     473/499      0.206G     0.02491   0.009977    0.01973          2       320:
52%|#####2       | 21/40 [00:04<00:03,  5.57it/s]
     473/499      0.206G     0.02491   0.009977    0.01973          2       320:
55%|#####5       | 22/40 [00:04<00:03,  5.64it/s]
     473/499      0.206G     0.02435   0.009791    0.01944          2       320:
55%|#####5       | 22/40 [00:04<00:03,  5.64it/s]
     473/499      0.206G     0.02435   0.009791    0.01944          2       320:
57%|#####7       | 23/40 [00:04<00:03,  5.55it/s]
     473/499      0.206G     0.02414   0.009697    0.01931          2       320:
57%|#####7       | 23/40 [00:04<00:03,  5.55it/s]
     473/499      0.206G     0.02414   0.009697    0.01931          2       320:
60%|######       | 24/40 [00:04<00:02,  5.63it/s]
     473/499      0.206G     0.02369   0.009611    0.01913          2       320:
60%|######       | 24/40 [00:04<00:02,  5.63it/s]
     473/499      0.206G     0.02369   0.009611    0.01913          2       320:
62%|######2      | 25/40 [00:04<00:02,  5.84it/s]
     473/499      0.206G     0.02313   0.009372    0.01895          1       320:
62%|######2      | 25/40 [00:04<00:02,  5.84it/s]
     473/499      0.206G     0.02313   0.009372    0.01895          1       320:
65%|######5      | 26/40 [00:04<00:02,  5.81it/s]
     473/499      0.206G     0.02252   0.009257    0.01894          2       320:
65%|######5      | 26/40 [00:05<00:02,  5.81it/s]
     473/499      0.206G     0.02252   0.009257    0.01894          2       320:
68%|######7      | 27/40 [00:05<00:02,  5.81it/s]
     473/499      0.206G     0.02193    0.00904    0.01867          1       320:
68%|######7      | 27/40 [00:05<00:02,  5.81it/s]
     473/499      0.206G     0.02193    0.00904    0.01867          1       320:
70%|#######      | 28/40 [00:05<00:02,  5.24it/s]
     473/499      0.206G     0.02173    0.00926    0.01866          4       320:
70%|#######      | 28/40 [00:05<00:02,  5.24it/s]
     473/499      0.206G     0.02173    0.00926    0.01866          4       320:
72%|#######2     | 29/40 [00:05<00:01,  5.51it/s]
     473/499      0.206G     0.02148   0.009098     0.0184          1       320:
```

```
72%|#######2  | 29/40 [00:05<00:01,  5.51it/s]
     473/499     0.206G    0.02148    0.009098    0.0184        1        320:
75%|#######5  | 30/40 [00:05<00:01,  5.45it/s]
     473/499     0.206G    0.02165    0.009013    0.01846       2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.45it/s]
     473/499     0.206G    0.02165    0.009013    0.01846       2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.71it/s]
     473/499     0.206G    0.02145    0.008869    0.01841       1        320:
78%|#######7  | 31/40 [00:05<00:01,  5.71it/s]
     473/499     0.206G    0.02145    0.008869    0.01841       1        320:
80%|########  | 32/40 [00:05<00:01,  5.44it/s]
     473/499     0.206G    0.02246    0.008775    0.0185        2        320:
80%|########  | 32/40 [00:06<00:01,  5.44it/s]
     473/499     0.206G    0.02246    0.008775    0.0185        2        320:
82%|########2 | 33/40 [00:06<00:01,  5.41it/s]
     473/499     0.206G    0.02258    0.008883    0.01855       4        320:
82%|########2 | 33/40 [00:06<00:01,  5.41it/s]
     473/499     0.206G    0.02258    0.008883    0.01855       4        320:
85%|########5 | 34/40 [00:06<00:01,  5.30it/s]
     473/499     0.206G    0.02212    0.008714    0.01842       1        320:
85%|########5 | 34/40 [00:06<00:01,  5.30it/s]
     473/499     0.206G    0.02212    0.008714    0.01842       1        320:
88%|########7 | 35/40 [00:06<00:00,  5.51it/s]
     473/499     0.206G    0.02236    0.008901    0.01845       4        320:
88%|########7 | 35/40 [00:06<00:00,  5.51it/s]
     473/499     0.206G    0.02236    0.008901    0.01845       4        320:
90%|######### | 36/40 [00:06<00:00,  5.32it/s]
     473/499     0.206G      0.022    0.008871    0.01835       2        320:
90%|######### | 36/40 [00:06<00:00,  5.32it/s]
     473/499     0.206G      0.022    0.008871    0.01835       2        320:
92%|#########2| 37/40 [00:06<00:00,  5.46it/s]
     473/499     0.206G    0.02268    0.009018    0.01833       4        320:
92%|#########2| 37/40 [00:07<00:00,  5.46it/s]
     473/499     0.206G    0.02268    0.009018    0.01833       4        320:
95%|#########5| 38/40 [00:07<00:00,  5.42it/s]
     473/499     0.206G    0.02307    0.008972    0.0183        2        320:
95%|#########5| 38/40 [00:07<00:00,  5.42it/s]
     473/499     0.206G    0.02307    0.008972    0.0183        2        320:
98%|#########7| 39/40 [00:07<00:00,  5.39it/s]
     473/499     0.206G    0.02292    0.008932    0.01829       2        320:
98%|#########7| 39/40 [00:07<00:00,  5.39it/s]
     473/499     0.206G    0.02292    0.008932    0.01829       2        320:
100%|##########| 40/40 [00:07<00:00,  5.64it/s]
     473/499     0.206G    0.02292    0.008932    0.01829       2        320:
100%|##########| 40/40 [00:07<00:00,  5.37it/s]

            Class      Images  Instances          P         R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
```

```
                  Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:01, 17.91it/s]
                  Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:01, 15.53it/s]
                  Class     Images  Instances          P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 16.68it/s]
                  Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 16.78it/s]
                  Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 17.74it/s]
                  Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 17.92it/s]
                  Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 18.04it/s]
                  Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:00<00:00, 18.12it/s]
                  Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.37it/s]
                  Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.70it/s]
                    all       40          40      0.979      0.975      0.992
0.796

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
    474/499     0.206G    0.02608   0.005533     0.0175          2       320:
0%|            | 0/40 [00:00<?, ?it/s]
    474/499     0.206G    0.02608   0.005533     0.0175          2       320:
2%|2           | 1/40 [00:00<00:06,  5.74it/s]
    474/499     0.206G    0.03531   0.006746    0.01693          2       320:
2%|2           | 1/40 [00:00<00:06,  5.74it/s]
    474/499     0.206G    0.03531   0.006746    0.01693          2       320:
5%|5           | 2/40 [00:00<00:06,  5.79it/s]
    474/499     0.206G    0.04418   0.006716    0.01844          2       320:
5%|5           | 2/40 [00:00<00:06,  5.79it/s]
    474/499     0.206G    0.04418   0.006716    0.01844          2       320:
8%|7           | 3/40 [00:00<00:06,  5.80it/s]
    474/499     0.206G    0.03565    0.00595    0.01704          1       320:
8%|7           | 3/40 [00:00<00:06,  5.80it/s]
    474/499     0.206G    0.03565    0.00595    0.01704          1       320:
10%|#           | 4/40 [00:00<00:06,  5.81it/s]
    474/499     0.206G    0.03226   0.007026    0.01714          4       320:
10%|#           | 4/40 [00:00<00:06,  5.81it/s]
    474/499     0.206G    0.03226   0.007026    0.01714          4       320:
12%|#2          | 5/40 [00:00<00:06,  5.63it/s]
    474/499     0.206G    0.03165   0.008069    0.01922          4       320:
12%|#2          | 5/40 [00:01<00:06,  5.63it/s]
```

234

```
     474/499      0.206G    0.03165    0.008069     0.01922         4           320:
15%|#5          | 6/40 [00:01<00:05,  5.69it/s]
     474/499      0.206G    0.03074    0.008275     0.02026         4           320:
15%|#5          | 6/40 [00:01<00:05,  5.69it/s]
     474/499      0.206G    0.03074    0.008275     0.02026         4           320:
18%|#7          | 7/40 [00:01<00:05,  5.55it/s]
     474/499      0.206G    0.03373    0.008635     0.01977         2           320:
18%|#7          | 7/40 [00:01<00:05,  5.55it/s]
     474/499      0.206G    0.03373    0.008635     0.01977         2           320:
20%|##          | 8/40 [00:01<00:05,  5.63it/s]
     474/499      0.206G    0.03292    0.009178     0.01983         4           320:
20%|##          | 8/40 [00:01<00:05,  5.63it/s]
     474/499      0.206G    0.03292    0.009178     0.01983         4           320:
22%|##2         | 9/40 [00:01<00:05,  5.53it/s]
     474/499      0.206G    0.03168    0.009052     0.01943         2           320:
22%|##2         | 9/40 [00:01<00:05,  5.53it/s]
     474/499      0.206G    0.03168    0.009052     0.01943         2           320:
25%|##5         | 10/40 [00:01<00:05,  5.59it/s]
     474/499      0.206G    0.03129    0.009015     0.02086         2           320:
25%|##5         | 10/40 [00:01<00:05,  5.59it/s]
     474/499      0.206G    0.03129    0.009015     0.02086         2           320:
28%|##7         | 11/40 [00:01<00:05,  5.65it/s]
     474/499      0.206G    0.03295    0.008874     0.02039         2           320:
28%|##7         | 11/40 [00:02<00:05,  5.65it/s]
     474/499      0.206G    0.03295    0.008874     0.02039         2           320:
30%|###         | 12/40 [00:02<00:04,  5.70it/s]
     474/499      0.206G    0.03104    0.008454     0.01962         1           320:
30%|###         | 12/40 [00:02<00:04,  5.70it/s]
     474/499      0.206G    0.03104    0.008454     0.01962         1           320:
32%|###2        | 13/40 [00:02<00:04,  5.58it/s]
     474/499      0.206G    0.03009    0.008325     0.01946         2           320:
32%|###2        | 13/40 [00:02<00:04,  5.58it/s]
     474/499      0.206G    0.03009    0.008325     0.01946         2           320:
35%|###5        | 14/40 [00:02<00:04,  5.36it/s]
     474/499      0.206G    0.03049    0.008908     0.02005         4           320:
35%|###5        | 14/40 [00:02<00:04,  5.36it/s]
     474/499      0.206G    0.03049    0.008908     0.02005         4           320:
38%|###7        | 15/40 [00:02<00:04,  5.35it/s]
     474/499      0.206G    0.03015    0.008834     0.01969         2           320:
38%|###7        | 15/40 [00:02<00:04,  5.35it/s]
     474/499      0.206G    0.03015    0.008834     0.01969         2           320:
40%|####        | 16/40 [00:02<00:04,  5.32it/s]
     474/499      0.206G    0.02876    0.008553     0.01927         1           320:
40%|####        | 16/40 [00:03<00:04,  5.32it/s]
     474/499      0.206G    0.02876    0.008553     0.01927         1           320:
42%|####2       | 17/40 [00:03<00:04,  5.46it/s]
     474/499      0.206G    0.02778    0.008397     0.01925         2           320:
42%|####2       | 17/40 [00:03<00:04,  5.46it/s]
```

```
     474/499      0.206G      0.02778    0.008397     0.01925           2          320:
45%|####5      | 18/40 [00:03<00:03,  5.54it/s]
     474/499      0.206G      0.02704    0.008149     0.01933           1          320:
45%|####5      | 18/40 [00:03<00:03,  5.54it/s]
     474/499      0.206G      0.02704    0.008149     0.01933           1          320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
     474/499      0.206G      0.02698    0.008409     0.01913           4          320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
     474/499      0.206G      0.02698    0.008409     0.01913           4          320:
50%|#####      | 20/40 [00:03<00:03,  5.46it/s]
     474/499      0.206G       0.0266    0.008459     0.01922           4          320:
50%|#####      | 20/40 [00:03<00:03,  5.46it/s]
     474/499      0.206G       0.0266    0.008459     0.01922           4          320:
52%|#####2     | 21/40 [00:03<00:03,  5.42it/s]
     474/499      0.206G      0.02694     0.00841     0.01931           2          320:
52%|#####2     | 21/40 [00:03<00:03,  5.42it/s]
     474/499      0.206G      0.02694     0.00841     0.01931           2          320:
55%|#####5     | 22/40 [00:03<00:03,  5.51it/s]
     474/499      0.206G      0.02642    0.008157     0.01916           1          320:
55%|#####5     | 22/40 [00:04<00:03,  5.51it/s]
     474/499      0.206G      0.02642    0.008157     0.01916           1          320:
57%|#####7     | 23/40 [00:04<00:02,  5.75it/s]
     474/499      0.206G      0.02723    0.008171     0.01909           2          320:
57%|#####7     | 23/40 [00:04<00:02,  5.75it/s]
     474/499      0.206G      0.02723    0.008171     0.01909           2          320:
60%|######     | 24/40 [00:04<00:03,  5.31it/s]
     474/499      0.206G      0.02748    0.008431     0.01903           4          320:
60%|######     | 24/40 [00:04<00:03,  5.31it/s]
     474/499      0.206G      0.02748    0.008431     0.01903           4          320:
62%|######2    | 25/40 [00:04<00:02,  5.31it/s]
     474/499      0.206G      0.02675    0.008243     0.01889           1          320:
62%|######2    | 25/40 [00:04<00:02,  5.31it/s]
     474/499      0.206G      0.02675    0.008243     0.01889           1          320:
65%|######5    | 26/40 [00:04<00:02,  5.46it/s]
     474/499      0.206G      0.02603    0.008056     0.01858           1          320:
65%|######5    | 26/40 [00:04<00:02,  5.46it/s]
     474/499      0.206G      0.02603    0.008056     0.01858           1          320:
68%|######7    | 27/40 [00:04<00:02,  5.55it/s]
     474/499      0.206G      0.02671    0.008023     0.01843           2          320:
68%|######7    | 27/40 [00:05<00:02,  5.55it/s]
     474/499      0.206G      0.02671    0.008023     0.01843           2          320:
70%|#######    | 28/40 [00:05<00:02,  5.48it/s]
     474/499      0.206G      0.02612    0.007854     0.01827           1          320:
70%|#######    | 28/40 [00:05<00:02,  5.48it/s]
     474/499      0.206G      0.02612    0.007854     0.01827           1          320:
72%|#######2   | 29/40 [00:05<00:01,  5.58it/s]
     474/499      0.206G      0.02562     0.00771     0.01812           1          320:
72%|#######2   | 29/40 [00:05<00:01,  5.58it/s]
```

```
      474/499        0.206G      0.02562       0.00771        0.01812           1           320:
75%|#######5  | 30/40 [00:05<00:01,  5.62it/s]
      474/499        0.206G      0.02516       0.007549       0.01806           1           320:
75%|#######5  | 30/40 [00:05<00:01,  5.62it/s]
      474/499        0.206G      0.02516       0.007549       0.01806           1           320:
78%|#######7  | 31/40 [00:05<00:01,  5.63it/s]
      474/499        0.206G      0.02505       0.007495       0.01789           1           320:
78%|#######7  | 31/40 [00:05<00:01,  5.63it/s]
      474/499        0.206G      0.02505       0.007495       0.01789           1           320:
80%|########  | 32/40 [00:05<00:01,  5.73it/s]
      474/499        0.206G      0.02467       0.00748        0.01774           2           320:
80%|########  | 32/40 [00:05<00:01,  5.73it/s]
      474/499        0.206G      0.02467       0.00748        0.01774           2           320:
82%|########2 | 33/40 [00:05<00:01,  5.61it/s]
      474/499        0.206G      0.02448       0.00747        0.01768           2           320:
82%|########2 | 33/40 [00:06<00:01,  5.61it/s]
      474/499        0.206G      0.02448       0.00747        0.01768           2           320:
85%|########5 | 34/40 [00:06<00:01,  5.67it/s]
      474/499        0.206G      0.02434       0.007436       0.01756           2           320:
85%|########5 | 34/40 [00:06<00:01,  5.67it/s]
      474/499        0.206G      0.02434       0.007436       0.01756           2           320:
88%|########7 | 35/40 [00:06<00:00,  5.29it/s]
      474/499        0.206G      0.02408       0.007533       0.01755           4           320:
88%|########7 | 35/40 [00:06<00:00,  5.29it/s]
      474/499        0.206G      0.02408       0.007533       0.01755           4           320:
90%|######### | 36/40 [00:06<00:00,  5.28it/s]
      474/499        0.206G      0.02396       0.007687       0.01764           4           320:
90%|######### | 36/40 [00:06<00:00,  5.28it/s]
      474/499        0.206G      0.02396       0.007687       0.01764           4           320:
92%|#########2| 37/40 [00:06<00:00,  5.05it/s]
      474/499        0.206G      0.02359       0.007568       0.01745           1           320:
92%|#########2| 37/40 [00:06<00:00,  5.05it/s]
      474/499        0.206G      0.02359       0.007568       0.01745           1           320:
95%|#########5| 38/40 [00:06<00:00,  5.13it/s]
      474/499        0.206G      0.02329       0.007526       0.01734           1           320:
95%|#########5| 38/40 [00:07<00:00,  5.13it/s]
      474/499        0.206G      0.02329       0.007526       0.01734           1           320:
98%|#########7| 39/40 [00:07<00:00,  5.05it/s]
      474/499        0.206G      0.02329       0.00751        0.01732           2           320:
98%|#########7| 39/40 [00:07<00:00,  5.05it/s]
      474/499        0.206G      0.02329       0.00751        0.01732           2           320:
100%|##########| 40/40 [00:07<00:00,  4.89it/s]
      474/499        0.206G      0.02329       0.00751        0.01732           2           320:
100%|##########| 40/40 [00:07<00:00,  5.44it/s]

                 Class      Images  Instances              P           R        mAP50
mAP50-95:    0%|             | 0/20 [00:00<?, ?it/s]
                 Class      Images  Instances              P           R        mAP50
```

```
mAP50-95:  10%|#          |  2/20 [00:00<00:01, 13.70it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95:  20%|##         |  4/20 [00:00<00:01, 15.20it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95:  30%|###        |  6/20 [00:00<00:00, 14.00it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95:  40%|####       |  8/20 [00:00<00:00, 14.73it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 14.65it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 14.89it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 14.66it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95:  80%|########   | 16/20 [00:01<00:00, 15.06it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.34it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.45it/s]
               Class      Images  Instances          P          R     mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.67it/s]
                 all         40         40      0.979      0.975      0.992
0.796

     Epoch   GPU_mem   box_loss   obj_loss   cls_loss  Instances      Size

  0%|          | 0/40 [00:00<?, ?it/s]
   475/499    0.206G    0.01711   0.004888    0.01416          1       320:
0%|          | 0/40 [00:00<?, ?it/s]
   475/499    0.206G    0.01711   0.004888    0.01416          1       320:
2%|2         | 1/40 [00:00<00:06,  6.40it/s]
   475/499    0.206G    0.01383   0.005421     0.0132          2       320:
2%|2         | 1/40 [00:00<00:06,  6.40it/s]
   475/499    0.206G    0.01383   0.005421     0.0132          2       320:
5%|5         | 2/40 [00:00<00:06,  6.04it/s]
   475/499    0.206G    0.01566   0.006631    0.01697          2       320:
5%|5         | 2/40 [00:00<00:06,  6.04it/s]
   475/499    0.206G    0.01566   0.006631    0.01697          2       320:
8%|7         | 3/40 [00:00<00:06,  5.90it/s]
   475/499    0.206G     0.0134   0.005584    0.01562          1       320:
8%|7         | 3/40 [00:00<00:06,  5.90it/s]
   475/499    0.206G     0.0134   0.005584    0.01562          1       320:
10%|#         | 4/40 [00:00<00:06,  5.86it/s]
   475/499    0.206G    0.01399   0.006061    0.01529          2       320:
10%|#         | 4/40 [00:00<00:06,  5.86it/s]
   475/499    0.206G    0.01399   0.006061    0.01529          2       320:
12%|#2        | 5/40 [00:00<00:05,  5.85it/s]
   475/499    0.206G     0.0128   0.005523    0.01542          1       320:
```

238

```
12%|#2          | 5/40 [00:01<00:05,  5.85it/s]
    475/499     0.206G     0.0128    0.005523    0.01542          1        320:
15%|#5          | 6/40 [00:01<00:05,  5.81it/s]
    475/499     0.206G    0.01228    0.005921    0.01533          2        320:
15%|#5          | 6/40 [00:01<00:05,  5.81it/s]
    475/499     0.206G    0.01228    0.005921    0.01533          2        320:
18%|#7          | 7/40 [00:01<00:05,  5.81it/s]
    475/499     0.206G    0.01394     0.00627    0.01619          3        320:
18%|#7          | 7/40 [00:01<00:05,  5.81it/s]
    475/499     0.206G    0.01394     0.00627    0.01619          3        320:
20%|##          | 8/40 [00:01<00:05,  5.65it/s]
    475/499     0.206G    0.01534    0.006909    0.01665          4        320:
20%|##          | 8/40 [00:01<00:05,  5.65it/s]
    475/499     0.206G    0.01534    0.006909    0.01665          4        320:
22%|##2         | 9/40 [00:01<00:05,  5.69it/s]
    475/499     0.206G    0.01509    0.006777    0.01642          1        320:
22%|##2         | 9/40 [00:01<00:05,  5.69it/s]
    475/499     0.206G    0.01509    0.006777    0.01642          1        320:
25%|##5         | 10/40 [00:01<00:05,  5.73it/s]
    475/499     0.206G     0.0157    0.007291    0.01691          4        320:
25%|##5         | 10/40 [00:01<00:05,  5.73it/s]
    475/499     0.206G     0.0157    0.007291    0.01691          4        320:
28%|##7         | 11/40 [00:01<00:05,  5.60it/s]
    475/499     0.206G    0.01616    0.007696    0.01732          4        320:
28%|##7         | 11/40 [00:02<00:05,  5.60it/s]
    475/499     0.206G    0.01616    0.007696    0.01732          4        320:
30%|###         | 12/40 [00:02<00:05,  5.11it/s]
    475/499     0.206G    0.01627    0.007679    0.01741          2        320:
30%|###         | 12/40 [00:02<00:05,  5.11it/s]
    475/499     0.206G    0.01627    0.007679    0.01741          2        320:
32%|###2        | 13/40 [00:02<00:05,  5.18it/s]
    475/499     0.206G    0.01567    0.007601    0.01703          2        320:
32%|###2        | 13/40 [00:02<00:05,  5.18it/s]
    475/499     0.206G    0.01567    0.007601    0.01703          2        320:
35%|###5        | 14/40 [00:02<00:04,  5.38it/s]
    475/499     0.206G    0.01781    0.007733    0.01832          2        320:
35%|###5        | 14/40 [00:02<00:04,  5.38it/s]
    475/499     0.206G    0.01781    0.007733    0.01832          2        320:
38%|###7        | 15/40 [00:02<00:04,  5.32it/s]
    475/499     0.206G     0.0172    0.007597    0.01809          1        320:
38%|###7        | 15/40 [00:02<00:04,  5.32it/s]
    475/499     0.206G     0.0172    0.007597    0.01809          1        320:
40%|####        | 16/40 [00:02<00:04,  5.33it/s]
    475/499     0.206G    0.01659    0.007345    0.01782          1        320:
40%|####        | 16/40 [00:03<00:04,  5.33it/s]
    475/499     0.206G    0.01659    0.007345    0.01782          1        320:
42%|####2       | 17/40 [00:03<00:04,  5.59it/s]
    475/499     0.206G    0.01666    0.007374    0.01785          2        320:
```

```
42%|####2       | 17/40 [00:03<00:04,  5.59it/s]
    475/499     0.206G    0.01666   0.007374    0.01785         2         320:
45%|####5       | 18/40 [00:03<00:03,  5.50it/s]
    475/499     0.206G    0.01623   0.00719     0.0176          1         320:
45%|####5       | 18/40 [00:03<00:03,  5.50it/s]
    475/499     0.206G    0.01623   0.00719     0.0176          1         320:
48%|####7       | 19/40 [00:03<00:03,  5.59it/s]
    475/499     0.206G    0.01584   0.006966    0.01746         1         320:
48%|####7       | 19/40 [00:03<00:03,  5.59it/s]
    475/499     0.206G    0.01584   0.006966    0.01746         1         320:
50%|#####       | 20/40 [00:03<00:03,  5.63it/s]
    475/499     0.206G    0.01542   0.006774    0.01727         1         320:
50%|#####       | 20/40 [00:03<00:03,  5.63it/s]
    475/499     0.206G    0.01542   0.006774    0.01727         1         320:
52%|#####2      | 21/40 [00:03<00:03,  5.69it/s]
    475/499     0.206G    0.01539   0.006915    0.0171          2         320:
52%|#####2      | 21/40 [00:03<00:03,  5.69it/s]
    475/499     0.206G    0.01539   0.006915    0.0171          2         320:
55%|#####5      | 22/40 [00:03<00:03,  5.73it/s]
    475/499     0.206G    0.01668   0.006961    0.01716         3         320:
55%|#####5      | 22/40 [00:04<00:03,  5.73it/s]
    475/499     0.206G    0.01668   0.006961    0.01716         3         320:
57%|#####7      | 23/40 [00:04<00:03,  5.66it/s]
    475/499     0.206G    0.01646   0.007117    0.017           2         320:
57%|#####7      | 23/40 [00:04<00:03,  5.66it/s]
    475/499     0.206G    0.01646   0.007117    0.017           2         320:
60%|######      | 24/40 [00:04<00:02,  5.64it/s]
    475/499     0.206G    0.01647   0.007372    0.01694         4         320:
60%|######      | 24/40 [00:04<00:02,  5.64it/s]
    475/499     0.206G    0.01647   0.007372    0.01694         4         320:
62%|######2     | 25/40 [00:04<00:02,  5.54it/s]
    475/499     0.206G    0.01656   0.007303    0.01697         2         320:
62%|######2     | 25/40 [00:04<00:02,  5.54it/s]
    475/499     0.206G    0.01656   0.007303    0.01697         2         320:
65%|######5     | 26/40 [00:04<00:02,  5.48it/s]
    475/499     0.206G    0.01657   0.007244    0.01684         2         320:
65%|######5     | 26/40 [00:04<00:02,  5.48it/s]
    475/499     0.206G    0.01657   0.007244    0.01684         2         320:
68%|######7     | 27/40 [00:04<00:02,  5.43it/s]
    475/499     0.206G    0.01637   0.007143    0.01701         1         320:
68%|######7     | 27/40 [00:05<00:02,  5.43it/s]
    475/499     0.206G    0.01637   0.007143    0.01701         1         320:
70%|#######     | 28/40 [00:05<00:02,  5.54it/s]
    475/499     0.206G    0.01639   0.007359    0.01703         4         320:
70%|#######     | 28/40 [00:05<00:02,  5.54it/s]
    475/499     0.206G    0.01639   0.007359    0.01703         4         320:
72%|#######2    | 29/40 [00:05<00:02,  5.45it/s]
    475/499     0.206G    0.01618   0.007228    0.01681         1         320:
```

```
72%|#######2   | 29/40 [00:05<00:02,  5.45it/s]
    475/499      0.206G    0.01618    0.007228    0.01681         1       320:
75%|#######5   | 30/40 [00:05<00:01,  5.41it/s]
    475/499      0.206G    0.01613    0.007163    0.01671         1       320:
75%|#######5   | 30/40 [00:05<00:01,  5.41it/s]
    475/499      0.206G    0.01613    0.007163    0.01671         1       320:
78%|#######7   | 31/40 [00:05<00:01,  5.53it/s]
    475/499      0.206G    0.01609    0.00705     0.01661         1       320:
78%|#######7   | 31/40 [00:05<00:01,  5.53it/s]
    475/499      0.206G    0.01609    0.00705     0.01661         1       320:
80%|########   | 32/40 [00:05<00:01,  5.60it/s]
    475/499      0.206G    0.01606    0.007083    0.01677         2       320:
80%|########   | 32/40 [00:05<00:01,  5.60it/s]
    475/499      0.206G    0.01606    0.007083    0.01677         2       320:
82%|########2  | 33/40 [00:05<00:01,  5.66it/s]
    475/499      0.206G    0.01698    0.007133    0.01674         2       320:
82%|########2  | 33/40 [00:06<00:01,  5.66it/s]
    475/499      0.206G    0.01698    0.007133    0.01674         2       320:
85%|########5  | 34/40 [00:06<00:01,  5.55it/s]
    475/499      0.206G    0.01753    0.007097    0.01676         2       320:
85%|########5  | 34/40 [00:06<00:01,  5.55it/s]
    475/499      0.206G    0.01753    0.007097    0.01676         2       320:
88%|########7  | 35/40 [00:06<00:00,  5.62it/s]
    475/499      0.206G    0.01731    0.007073    0.01681         1       320:
88%|########7  | 35/40 [00:06<00:00,  5.62it/s]
    475/499      0.206G    0.01731    0.007073    0.01681         1       320:
90%|######### | 36/40 [00:06<00:00,  5.68it/s]
    475/499      0.206G    0.01712    0.006999    0.01672         1       320:
90%|######### | 36/40 [00:06<00:00,  5.68it/s]
    475/499      0.206G    0.01712    0.006999    0.01672         1       320:
92%|#########2| 37/40 [00:06<00:00,  5.72it/s]
    475/499      0.206G    0.01734    0.007159    0.01673         4       320:
92%|#########2| 37/40 [00:06<00:00,  5.72it/s]
    475/499      0.206G    0.01734    0.007159    0.01673         4       320:
95%|#########5| 38/40 [00:06<00:00,  5.73it/s]
    475/499      0.206G    0.01731    0.007129    0.01669         1       320:
95%|#########5| 38/40 [00:06<00:00,  5.73it/s]
    475/499      0.206G    0.01731    0.007129    0.01669         1       320:
98%|#########7| 39/40 [00:06<00:00,  5.60it/s]
    475/499      0.206G    0.01706    0.007022    0.01668         1       320:
98%|#########7| 39/40 [00:07<00:00,  5.60it/s]
    475/499      0.206G    0.01706    0.007022    0.01668         1       320:
100%|##########| 40/40 [00:07<00:00,  5.66it/s]
    475/499      0.206G    0.01706    0.007022    0.01668         1       320:
100%|##########| 40/40 [00:07<00:00,  5.59it/s]

              Class      Images  Instances          P          R      mAP50
mAP50-95:   0%|             | 0/20 [00:00<?, ?it/s]
```

```
                  Class       Images  Instances          P          R      mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:01, 16.29it/s]
                  Class       Images  Instances          P          R      mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:00, 16.96it/s]
                  Class       Images  Instances          P          R      mAP50
mAP50-95:  30%|###          | 6/20 [00:00<00:00, 15.59it/s]
                  Class       Images  Instances          P          R      mAP50
mAP50-95:  40%|####         | 8/20 [00:00<00:00, 15.75it/s]
                  Class       Images  Instances          P          R      mAP50
mAP50-95:  50%|#####        | 10/20 [00:00<00:00, 16.42it/s]
                  Class       Images  Instances          P          R      mAP50
mAP50-95:  60%|######       | 12/20 [00:00<00:00, 17.16it/s]
                  Class       Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5     | 15/20 [00:00<00:00, 17.96it/s]
                  Class       Images  Instances          P          R      mAP50
mAP50-95:  85%|########5    | 17/20 [00:01<00:00, 17.35it/s]
                  Class       Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5   | 19/20 [00:01<00:00, 17.61it/s]
                  Class       Images  Instances          P          R      mAP50
mAP50-95: 100%|##########|   | 20/20 [00:01<00:00, 16.99it/s]
                    all          40          40      0.979      0.975      0.993
0.799

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    476/499     0.206G   0.008232   0.004711    0.01716          1       320:
0%|           | 0/40 [00:00<?, ?it/s]
    476/499     0.206G   0.008232   0.004711    0.01716          1       320:
2%|2          | 1/40 [00:00<00:06,  6.40it/s]
    476/499     0.206G   0.008014    0.00531    0.01462          2       320:
2%|2          | 1/40 [00:00<00:06,  6.40it/s]
    476/499     0.206G   0.008014    0.00531    0.01462          2       320:
5%|5          | 2/40 [00:00<00:06,  6.00it/s]
    476/499     0.206G    0.01743   0.006266    0.01651          2       320:
5%|5          | 2/40 [00:00<00:06,  6.00it/s]
    476/499     0.206G    0.01743   0.006266    0.01651          2       320:
8%|7          | 3/40 [00:00<00:06,  5.68it/s]
    476/499     0.206G    0.02666   0.005742    0.01998          2       320:
8%|7          | 3/40 [00:00<00:06,  5.68it/s]
    476/499     0.206G    0.02666   0.005742    0.01998          2       320:
10%|#          | 4/40 [00:00<00:06,  5.73it/s]
    476/499     0.206G    0.02337   0.006279    0.01891          2       320:
10%|#          | 4/40 [00:00<00:06,  5.73it/s]
    476/499     0.206G    0.02337   0.006279    0.01891          2       320:
12%|#2         | 5/40 [00:00<00:06,  5.74it/s]
    476/499     0.206G    0.02962   0.005716    0.02064          2       320:
12%|#2         | 5/40 [00:01<00:06,  5.74it/s]
```

242

```
    476/499     0.206G     0.02962     0.005716     0.02064          2          320:
15%|#5         | 6/40 [00:01<00:06,  5.60it/s]
    476/499     0.206G     0.02872     0.005853     0.02074          2          320:
15%|#5         | 6/40 [00:01<00:06,  5.60it/s]
    476/499     0.206G     0.02872     0.005853     0.02074          2          320:
18%|#7         | 7/40 [00:01<00:05,  5.67it/s]
    476/499     0.206G     0.02993     0.005936     0.02035          2          320:
18%|#7         | 7/40 [00:01<00:05,  5.67it/s]
    476/499     0.206G     0.02993     0.005936     0.02035          2          320:
20%|##         | 8/40 [00:01<00:05,  5.40it/s]
    476/499     0.206G     0.02815     0.005777     0.01939          1          320:
20%|##         | 8/40 [00:01<00:05,  5.40it/s]
    476/499     0.206G     0.02815     0.005777     0.01939          1          320:
22%|##2        | 9/40 [00:01<00:05,  5.52it/s]
    476/499     0.206G     0.02781     0.005781     0.01893          2          320:
22%|##2        | 9/40 [00:01<00:05,  5.52it/s]
    476/499     0.206G     0.02781     0.005781     0.01893          2          320:
25%|##5        | 10/40 [00:01<00:05,  5.59it/s]
    476/499     0.206G     0.02749     0.006499     0.01897          4          320:
25%|##5        | 10/40 [00:01<00:05,  5.59it/s]
    476/499     0.206G     0.02749     0.006499     0.01897          4          320:
28%|##7        | 11/40 [00:01<00:05,  5.38it/s]
    476/499     0.206G     0.02642     0.007229     0.01904          4          320:
28%|##7        | 11/40 [00:02<00:05,  5.38it/s]
    476/499     0.206G     0.02642     0.007229     0.01904          4          320:
30%|###        | 12/40 [00:02<00:05,  5.36it/s]
    476/499     0.206G     0.02548     0.007282     0.01894          2          320:
30%|###        | 12/40 [00:02<00:05,  5.36it/s]
    476/499     0.206G     0.02548     0.007282     0.01894          2          320:
32%|###2       | 13/40 [00:02<00:05,  5.35it/s]
    476/499     0.206G     0.02505     0.00767     0.0191          4          320:
32%|###2       | 13/40 [00:02<00:05,  5.35it/s]
    476/499     0.206G     0.02505     0.00767     0.0191          4          320:
35%|###5       | 14/40 [00:02<00:04,  5.32it/s]
    476/499     0.206G     0.02388     0.00745     0.01871          1          320:
35%|###5       | 14/40 [00:02<00:04,  5.32it/s]
    476/499     0.206G     0.02388     0.00745     0.01871          1          320:
38%|###7       | 15/40 [00:02<00:04,  5.46it/s]
    476/499     0.206G     0.02367     0.007593     0.01863          2          320:
38%|###7       | 15/40 [00:02<00:04,  5.46it/s]
    476/499     0.206G     0.02367     0.007593     0.01863          2          320:
40%|####       | 16/40 [00:02<00:04,  5.40it/s]
    476/499     0.206G     0.02286     0.007702     0.01872          2          320:
40%|####       | 16/40 [00:03<00:04,  5.40it/s]
    476/499     0.206G     0.02286     0.007702     0.01872          2          320:
42%|####2      | 17/40 [00:03<00:04,  5.52it/s]
    476/499     0.206G     0.02278     0.0083     0.01966          4          320:
42%|####2      | 17/40 [00:03<00:04,  5.52it/s]
```

```
    476/499      0.206G      0.02278      0.0083     0.01966        4        320:
45%|####5      | 18/40 [00:03<00:03,  5.61it/s]
    476/499      0.206G      0.02271      0.00868     0.02039        4        320:
45%|####5      | 18/40 [00:03<00:03,  5.61it/s]
    476/499      0.206G      0.02271      0.00868     0.02039        4        320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
    476/499      0.206G      0.02317      0.008973    0.02032        4        320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
    476/499      0.206G      0.02317      0.008973    0.02032        4        320:
50%|#####      | 20/40 [00:03<00:03,  5.32it/s]
    476/499      0.206G      0.02379      0.009208    0.02045        4        320:
50%|#####      | 20/40 [00:03<00:03,  5.32it/s]
    476/499      0.206G      0.02379      0.009208    0.02045        4        320:
52%|#####2     | 21/40 [00:03<00:03,  5.45it/s]
    476/499      0.206G      0.0231       0.00905     0.0202         2        320:
52%|#####2     | 21/40 [00:03<00:03,  5.45it/s]
    476/499      0.206G      0.0231       0.00905     0.0202         2        320:
55%|#####5     | 22/40 [00:03<00:03,  5.40it/s]
    476/499      0.206G      0.02359      0.008985    0.0215         2        320:
55%|#####5     | 22/40 [00:04<00:03,  5.40it/s]
    476/499      0.206G      0.02359      0.008985    0.0215         2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.25it/s]
    476/499      0.206G      0.0235       0.0094      0.0213         4        320:
57%|#####7     | 23/40 [00:04<00:03,  5.25it/s]
    476/499      0.206G      0.0235       0.0094      0.0213         4        320:
60%|######     | 24/40 [00:04<00:03,  5.15it/s]
    476/499      0.206G      0.02392      0.009605    0.02125        4        320:
60%|######     | 24/40 [00:04<00:03,  5.15it/s]
    476/499      0.206G      0.02392      0.009605    0.02125        4        320:
62%|######2    | 25/40 [00:04<00:02,  5.03it/s]
    476/499      0.206G      0.02349      0.009432    0.02109        2        320:
62%|######2    | 25/40 [00:04<00:02,  5.03it/s]
    476/499      0.206G      0.02349      0.009432    0.02109        2        320:
65%|######5    | 26/40 [00:04<00:02,  5.03it/s]
    476/499      0.206G      0.02396      0.009621    0.02091        4        320:
65%|######5    | 26/40 [00:05<00:02,  5.03it/s]
    476/499      0.206G      0.02396      0.009621    0.02091        4        320:
68%|######7    | 27/40 [00:05<00:02,  4.99it/s]
    476/499      0.206G      0.02349      0.009399    0.02039        1        320:
68%|######7    | 27/40 [00:05<00:02,  4.99it/s]
    476/499      0.206G      0.02349      0.009399    0.02039        1        320:
70%|#######    | 28/40 [00:05<00:02,  5.21it/s]
    476/499      0.206G      0.02292      0.009155    0.02017        1        320:
70%|#######    | 28/40 [00:05<00:02,  5.21it/s]
    476/499      0.206G      0.02292      0.009155    0.02017        1        320:
72%|#######2   | 29/40 [00:05<00:02,  5.12it/s]
    476/499      0.206G      0.02241      0.008932    0.01987        1        320:
72%|#######2   | 29/40 [00:05<00:02,  5.12it/s]
```

```
      476/499      0.206G     0.02241    0.008932     0.01987          1         320:
75%|#######5  | 30/40 [00:05<00:01,  5.16it/s]
      476/499      0.206G     0.02274    0.008895     0.01985          2         320:
75%|#######5  | 30/40 [00:05<00:01,  5.16it/s]
      476/499      0.206G     0.02274    0.008895     0.01985          2         320:
78%|#######7  | 31/40 [00:05<00:01,  4.97it/s]
      476/499      0.206G     0.02232    0.008779      0.0197          2         320:
78%|#######7  | 31/40 [00:05<00:01,  4.97it/s]
      476/499      0.206G     0.02232    0.008779      0.0197          2         320:
80%|########  | 32/40 [00:05<00:01,  5.07it/s]
      476/499      0.206G     0.02242    0.009012     0.02014          4         320:
80%|########  | 32/40 [00:06<00:01,  5.07it/s]
      476/499      0.206G     0.02242    0.009012     0.02014          4         320:
82%|########2 | 33/40 [00:06<00:01,  4.90it/s]
      476/499      0.206G     0.02332    0.008915     0.02016          2         320:
82%|########2 | 33/40 [00:06<00:01,  4.90it/s]
      476/499      0.206G     0.02332    0.008915     0.02016          2         320:
85%|########5 | 34/40 [00:06<00:01,  4.91it/s]
      476/499      0.206G     0.02291    0.008776      0.0199          1         320:
85%|########5 | 34/40 [00:06<00:01,  4.91it/s]
      476/499      0.206G     0.02291    0.008776      0.0199          1         320:
88%|########7 | 35/40 [00:06<00:00,  5.02it/s]
      476/499      0.206G     0.02338    0.008782        0.02          4         320:
88%|########7 | 35/40 [00:06<00:00,  5.02it/s]
      476/499      0.206G     0.02338    0.008782        0.02          4         320:
90%|######### | 36/40 [00:06<00:00,  4.77it/s]
      476/499      0.206G     0.02354    0.008885     0.02008          4         320:
90%|######### | 36/40 [00:07<00:00,  4.77it/s]
      476/499      0.206G     0.02354    0.008885     0.02008          4         320:
92%|#########2| 37/40 [00:07<00:00,  4.81it/s]
      476/499      0.206G     0.02307    0.008748     0.02004          1         320:
92%|#########2| 37/40 [00:07<00:00,  4.81it/s]
      476/499      0.206G     0.02307    0.008748     0.02004          1         320:
95%|#########5| 38/40 [00:07<00:00,  4.73it/s]
      476/499      0.206G      0.0231    0.008937     0.02008          4         320:
95%|#########5| 38/40 [00:07<00:00,  4.73it/s]
      476/499      0.206G      0.0231    0.008937     0.02008          4         320:
98%|#########7| 39/40 [00:07<00:00,  4.89it/s]
      476/499      0.206G     0.02275    0.008783     0.02009          1         320:
98%|#########7| 39/40 [00:07<00:00,  4.89it/s]
      476/499      0.206G     0.02275    0.008783     0.02009          1         320:
100%|##########| 40/40 [00:07<00:00,  5.04it/s]
      476/499      0.206G     0.02275    0.008783     0.02009          1         320:
100%|##########| 40/40 [00:07<00:00,  5.24it/s]

               Class      Images  Instances          P          R       mAP50
mAP50-95:    0%|          | 0/20 [00:00<?, ?it/s]
               Class      Images  Instances          P          R       mAP50
```

```
mAP50-95:  15%|#5          | 3/20 [00:00<00:00, 18.48it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:  25%|##5         | 5/20 [00:00<00:00, 17.17it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:  35%|###5        | 7/20 [00:00<00:00, 17.61it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:  45%|####5       | 9/20 [00:00<00:00, 16.43it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:  55%|#####5      | 11/20 [00:00<00:00, 17.46it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:  65%|######5     | 13/20 [00:00<00:00, 17.72it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5    | 15/20 [00:00<00:00, 16.43it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:  85%|########5 | 17/20 [00:01<00:00, 16.29it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 16.16it/s]
                Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.93it/s]
                  all         40         40      0.979      0.975      0.994
0.797


      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
     477/499     0.206G    0.02565    0.01175    0.01865          4        320:
0%|            | 0/40 [00:00<?, ?it/s]
     477/499     0.206G    0.02565    0.01175    0.01865          4        320:
2%|2          | 1/40 [00:00<00:06,  6.28it/s]
     477/499     0.206G      0.017   0.008954    0.01527          2        320:
2%|2          | 1/40 [00:00<00:06,  6.28it/s]
     477/499     0.206G      0.017   0.008954    0.01527          2        320:
5%|5          | 2/40 [00:00<00:06,  5.59it/s]
     477/499     0.206G    0.01638   0.008427    0.01578          2        320:
5%|5          | 2/40 [00:00<00:06,  5.59it/s]
     477/499     0.206G    0.01638   0.008427    0.01578          2        320:
8%|7          | 3/40 [00:00<00:06,  5.75it/s]
     477/499     0.206G     0.0196     0.0083    0.01555          2        320:
8%|7          | 3/40 [00:00<00:06,  5.75it/s]
     477/499     0.206G     0.0196     0.0083    0.01555          2        320:
10%|#          | 4/40 [00:00<00:06,  5.58it/s]
     477/499     0.206G    0.01747   0.007381    0.01539          1        320:
10%|#          | 4/40 [00:00<00:06,  5.58it/s]
     477/499     0.206G    0.01747   0.007381    0.01539          1        320:
12%|#2         | 5/40 [00:00<00:06,  5.66it/s]
     477/499     0.206G    0.01566   0.006779    0.01518          1        320:
12%|#2         | 5/40 [00:01<00:06,  5.66it/s]
     477/499     0.206G    0.01566   0.006779    0.01518          1        320:
```

```
 15%|#5          | 6/40 [00:01<00:05,  5.89it/s]
      477/499     0.206G    0.01494   0.007385   0.01487         4         320:
 15%|#5          | 6/40 [00:01<00:05,  5.89it/s]
      477/499     0.206G    0.01494   0.007385   0.01487         4         320:
 18%|#7          | 7/40 [00:01<00:05,  5.53it/s]
      477/499     0.206G    0.01423   0.007375   0.01463         2         320:
 18%|#7          | 7/40 [00:01<00:05,  5.53it/s]
      477/499     0.206G    0.01423   0.007375   0.01463         2         320:
 20%|##          | 8/40 [00:01<00:05,  5.62it/s]
      477/499     0.206G    0.01566    0.00808   0.01479         2         320:
 20%|##          | 8/40 [00:01<00:05,  5.62it/s]
      477/499     0.206G    0.01566    0.00808   0.01479         2         320:
 22%|##2         | 9/40 [00:01<00:05,  5.52it/s]
      477/499     0.206G     0.0156   0.008746   0.01548         4         320:
 22%|##2         | 9/40 [00:01<00:05,  5.52it/s]
      477/499     0.206G     0.0156   0.008746   0.01548         4         320:
 25%|##5         | 10/40 [00:01<00:05,  5.44it/s]
      477/499     0.206G    0.01664    0.00929   0.01683         2         320:
 25%|##5         | 10/40 [00:01<00:05,  5.44it/s]
      477/499     0.206G    0.01664    0.00929   0.01683         2         320:
 28%|##7         | 11/40 [00:01<00:05,  5.41it/s]
      477/499     0.206G     0.0158   0.008791   0.01656         1         320:
 28%|##7         | 11/40 [00:02<00:05,  5.41it/s]
      477/499     0.206G     0.0158   0.008791   0.01656         1         320:
 30%|###         | 12/40 [00:02<00:05,  5.36it/s]
      477/499     0.206G    0.01679   0.009391   0.01651         4         320:
 30%|###         | 12/40 [00:02<00:05,  5.36it/s]
      477/499     0.206G    0.01679   0.009391   0.01651         4         320:
 32%|###2        | 13/40 [00:02<00:05,  5.23it/s]
      477/499     0.206G    0.01755   0.009306    0.0181         2         320:
 32%|###2        | 13/40 [00:02<00:05,  5.23it/s]
      477/499     0.206G    0.01755   0.009306    0.0181         2         320:
 35%|###5        | 14/40 [00:02<00:04,  5.39it/s]
      477/499     0.206G     0.0187   0.009545   0.01827         4         320:
 35%|###5        | 14/40 [00:02<00:04,  5.39it/s]
      477/499     0.206G     0.0187   0.009545   0.01827         4         320:
 38%|###7        | 15/40 [00:02<00:04,  5.35it/s]
      477/499     0.206G     0.0186   0.009762   0.01851         4         320:
 38%|###7        | 15/40 [00:02<00:04,  5.35it/s]
      477/499     0.206G     0.0186   0.009762   0.01851         4         320:
 40%|####        | 16/40 [00:02<00:04,  5.34it/s]
      477/499     0.206G    0.01863    0.01006   0.01862         4         320:
 40%|####        | 16/40 [00:03<00:04,  5.34it/s]
      477/499     0.206G    0.01863    0.01006   0.01862         4         320:
 42%|####2       | 17/40 [00:03<00:04,  5.34it/s]
      477/499     0.206G    0.01992   0.009977   0.01845         3         320:
 42%|####2       | 17/40 [00:03<00:04,  5.34it/s]
      477/499     0.206G    0.01992   0.009977   0.01845         3         320:
```

```
45%|####5      | 18/40 [00:03<00:04,  5.33it/s]
    477/499     0.206G     0.02093     0.01053     0.01883         4        320:
45%|####5      | 18/40 [00:03<00:04,  5.33it/s]
    477/499     0.206G     0.02093     0.01053     0.01883         4        320:
48%|####7      | 19/40 [00:03<00:03,  5.34it/s]
    477/499     0.206G      0.0207     0.01011     0.01822         1        320:
48%|####7      | 19/40 [00:03<00:03,  5.34it/s]
    477/499     0.206G      0.0207     0.01011     0.01822         1        320:
50%|#####      | 20/40 [00:03<00:03,  5.62it/s]
    477/499     0.206G     0.02135    0.009963      0.0182         2        320:
50%|#####      | 20/40 [00:03<00:03,  5.62it/s]
    477/499     0.206G     0.02135    0.009963      0.0182         2        320:
52%|#####2     | 21/40 [00:03<00:03,  5.66it/s]
    477/499     0.206G     0.02196     0.01019     0.01858         4        320:
52%|#####2     | 21/40 [00:03<00:03,  5.66it/s]
    477/499     0.206G     0.02196     0.01019     0.01858         4        320:
55%|#####5     | 22/40 [00:03<00:03,  5.55it/s]
    477/499     0.206G     0.02179     0.01029     0.01855         4        320:
55%|#####5     | 22/40 [00:04<00:03,  5.55it/s]
    477/499     0.206G     0.02179     0.01029     0.01855         4        320:
57%|#####7     | 23/40 [00:04<00:03,  5.35it/s]
    477/499     0.206G     0.02182     0.01039     0.01875         4        320:
57%|#####7     | 23/40 [00:04<00:03,  5.35it/s]
    477/499     0.206G     0.02182     0.01039     0.01875         4        320:
60%|######     | 24/40 [00:04<00:03,  4.95it/s]
    477/499     0.206G     0.02265     0.01027      0.0193         2        320:
60%|######     | 24/40 [00:04<00:03,  4.95it/s]
    477/499     0.206G     0.02265     0.01027      0.0193         2        320:
62%|######2    | 25/40 [00:04<00:03,  4.94it/s]
    477/499     0.206G     0.02342     0.01025     0.01944         2        320:
62%|######2    | 25/40 [00:04<00:03,  4.94it/s]
    477/499     0.206G     0.02342     0.01025     0.01944         2        320:
65%|######5    | 26/40 [00:04<00:02,  4.99it/s]
    477/499     0.206G     0.02308     0.01031     0.01932         4        320:
65%|######5    | 26/40 [00:05<00:02,  4.99it/s]
    477/499     0.206G     0.02308     0.01031     0.01932         4        320:
68%|######7    | 27/40 [00:05<00:02,  5.02it/s]
    477/499     0.206G     0.02341     0.01023     0.02013         2        320:
68%|######7    | 27/40 [00:05<00:02,  5.02it/s]
    477/499     0.206G     0.02341     0.01023     0.02013         2        320:
70%|#######    | 28/40 [00:05<00:02,  5.11it/s]
    477/499     0.206G     0.02311     0.01007     0.01992         1        320:
70%|#######    | 28/40 [00:05<00:02,  5.11it/s]
    477/499     0.206G     0.02311     0.01007     0.01992         1        320:
72%|#######2   | 29/40 [00:05<00:02,  5.30it/s]
    477/499     0.206G     0.02349     0.01007     0.01989         3        320:
72%|#######2   | 29/40 [00:05<00:02,  5.30it/s]
    477/499     0.206G     0.02349     0.01007     0.01989         3        320:
```

```
75%|#######5   | 30/40 [00:05<00:01,  5.18it/s]
    477/499      0.206G    0.02301    0.01001     0.01972           4          320:
75%|#######5   | 30/40 [00:05<00:01,  5.18it/s]
    477/499      0.206G    0.02301    0.01001     0.01972           4          320:
78%|#######7   | 31/40 [00:05<00:01,  5.36it/s]
    477/499      0.206G     0.0228   0.009873     0.01956           2          320:
78%|#######7   | 31/40 [00:05<00:01,  5.36it/s]
    477/499      0.206G     0.0228   0.009873     0.01956           2          320:
80%|########   | 32/40 [00:05<00:01,  5.34it/s]
    477/499      0.206G    0.02248   0.009717     0.01942           2          320:
80%|########   | 32/40 [00:06<00:01,  5.34it/s]
    477/499      0.206G    0.02248   0.009717     0.01942           2          320:
82%|########2  | 33/40 [00:06<00:01,  5.33it/s]
    477/499      0.206G    0.02288    0.00967     0.01927           2          320:
82%|########2  | 33/40 [00:06<00:01,  5.33it/s]
    477/499      0.206G    0.02288    0.00967     0.01927           2          320:
85%|########5  | 34/40 [00:06<00:01,  5.47it/s]
    477/499      0.206G    0.02248   0.009585     0.01907           2          320:
85%|########5  | 34/40 [00:06<00:01,  5.47it/s]
    477/499      0.206G    0.02248   0.009585     0.01907           2          320:
88%|########7  | 35/40 [00:06<00:00,  5.48it/s]
    477/499      0.206G    0.02242   0.009723      0.0192           4          320:
88%|########7  | 35/40 [00:06<00:00,  5.48it/s]
    477/499      0.206G    0.02242   0.009723      0.0192           4          320:
90%|######### | 36/40 [00:06<00:00,  5.36it/s]
    477/499      0.206G    0.02198   0.009557     0.01937           1          320:
90%|######### | 36/40 [00:06<00:00,  5.36it/s]
    477/499      0.206G    0.02198   0.009557     0.01937           1          320:
92%|#########2| 37/40 [00:06<00:00,  5.49it/s]
    477/499      0.206G    0.02206   0.009409     0.01926           1          320:
92%|#########2| 37/40 [00:07<00:00,  5.49it/s]
    477/499      0.206G    0.02206   0.009409     0.01926           1          320:
95%|#########5| 38/40 [00:07<00:00,  5.56it/s]
    477/499      0.206G    0.02196   0.009549     0.01922           4          320:
95%|#########5| 38/40 [00:07<00:00,  5.56it/s]
    477/499      0.206G    0.02196   0.009549     0.01922           4          320:
98%|#########7| 39/40 [00:07<00:00,  5.48it/s]
    477/499      0.206G    0.02249   0.009507     0.01925           2          320:
98%|#########7| 39/40 [00:07<00:00,  5.48it/s]
    477/499      0.206G    0.02249   0.009507     0.01925           2          320:
100%|##########| 40/40 [00:07<00:00,  5.30it/s]
    477/499      0.206G    0.02249   0.009507     0.01925           2          320:
100%|##########| 40/40 [00:07<00:00,  5.38it/s]

                Class      Images  Instances          P           R      mAP50
mAP50-95:    0%|            | 0/20 [00:00<?, ?it/s]
                Class      Images  Instances          P           R      mAP50
mAP50-95:   10%|#           | 2/20 [00:00<00:01, 14.20it/s]
```

```
              Class      Images  Instances          P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:00, 16.35it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 17.17it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 17.60it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 17.08it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  65%|######5     | 13/20 [00:00<00:00, 18.50it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  75%|#######5    | 15/20 [00:00<00:00, 18.44it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  85%|########5   | 17/20 [00:00<00:00, 18.39it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  95%|#########5  | 19/20 [00:01<00:00, 16.56it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########  | 20/20 [00:01<00:00, 17.46it/s]
                all          40         40      0.979      0.975      0.994
0.797


      Epoch    GPU_mem    box_loss    obj_loss    cls_loss   Instances      Size

   0%|           | 0/40 [00:00<?, ?it/s]
     478/499     0.206G    0.03883    0.009446    0.01682          2        320:
 0%|           | 0/40 [00:00<?, ?it/s]
     478/499     0.206G    0.03883    0.009446    0.01682          2        320:
 2%|2          | 1/40 [00:00<00:06,  5.86it/s]
     478/499     0.206G    0.03486    0.00898     0.01747          2        320:
 2%|2          | 1/40 [00:00<00:06,  5.86it/s]
     478/499     0.206G    0.03486    0.00898     0.01747          2        320:
 5%|5          | 2/40 [00:00<00:06,  5.79it/s]
     478/499     0.206G    0.02746    0.008429    0.01566          2        320:
 5%|5          | 2/40 [00:00<00:06,  5.79it/s]
     478/499     0.206G    0.02746    0.008429    0.01566          2        320:
 8%|7          | 3/40 [00:00<00:06,  5.81it/s]
     478/499     0.206G    0.03206    0.009212    0.0157           3        320:
 8%|7          | 3/40 [00:00<00:06,  5.81it/s]
     478/499     0.206G    0.03206    0.009212    0.0157           3        320:
10%|#          | 4/40 [00:00<00:06,  5.57it/s]
     478/499     0.206G    0.03748    0.01042     0.01592          4        320:
10%|#          | 4/40 [00:00<00:06,  5.57it/s]
     478/499     0.206G    0.03748    0.01042     0.01592          4        320:
12%|#2         | 5/40 [00:00<00:06,  5.48it/s]
     478/499     0.206G    0.03347    0.009385    0.01558          1        320:
12%|#2         | 5/40 [00:01<00:06,  5.48it/s]
     478/499     0.206G    0.03347    0.009385    0.01558          1        320:
15%|#5         | 6/40 [00:01<00:06,  5.59it/s]
```

```
    478/499      0.206G     0.03525    0.008976      0.01545            2          320:
15%|#5          | 6/40 [00:01<00:06,  5.59it/s]
    478/499      0.206G     0.03525    0.008976      0.01545            2          320:
18%|#7          | 7/40 [00:01<00:06,  5.49it/s]
    478/499      0.206G     0.03676    0.008918      0.01562            2          320:
18%|#7          | 7/40 [00:01<00:06,  5.49it/s]
    478/499      0.206G     0.03676    0.008918      0.01562            2          320:
20%|##          | 8/40 [00:01<00:05,  5.44it/s]
    478/499      0.206G     0.03362    0.008284       0.0154            1          320:
20%|##          | 8/40 [00:01<00:05,  5.44it/s]
    478/499      0.206G     0.03362    0.008284       0.0154            1          320:
22%|##2         | 9/40 [00:01<00:05,  5.55it/s]
    478/499      0.206G     0.03105    0.007885      0.01527            1          320:
22%|##2         | 9/40 [00:01<00:05,  5.55it/s]
    478/499      0.206G     0.03105    0.007885      0.01527            1          320:
25%|##5         | 10/40 [00:01<00:05,  5.61it/s]
    478/499      0.206G     0.03002    0.008729      0.01626            4          320:
25%|##5         | 10/40 [00:01<00:05,  5.61it/s]
    478/499      0.206G     0.03002    0.008729      0.01626            4          320:
28%|##7         | 11/40 [00:01<00:05,  5.67it/s]
    478/499      0.206G     0.02845    0.008507      0.01686            2          320:
28%|##7         | 11/40 [00:02<00:05,  5.67it/s]
    478/499      0.206G     0.02845    0.008507      0.01686            2          320:
30%|###         | 12/40 [00:02<00:05,  5.57it/s]
    478/499      0.206G     0.02687    0.008066      0.01642            1          320:
30%|###         | 12/40 [00:02<00:05,  5.57it/s]
    478/499      0.206G     0.02687    0.008066      0.01642            1          320:
32%|###2        | 13/40 [00:02<00:04,  5.44it/s]
    478/499      0.206G     0.02666    0.007738      0.01624            1          320:
32%|###2        | 13/40 [00:02<00:04,  5.44it/s]
    478/499      0.206G     0.02666    0.007738      0.01624            1          320:
35%|###5        | 14/40 [00:02<00:04,  5.45it/s]
    478/499      0.206G     0.02625    0.008087      0.01651            4          320:
35%|###5        | 14/40 [00:02<00:04,  5.45it/s]
    478/499      0.206G     0.02625    0.008087      0.01651            4          320:
38%|###7        | 15/40 [00:02<00:04,  5.15it/s]
    478/499      0.206G     0.02532    0.007803      0.01635            1          320:
38%|###7        | 15/40 [00:02<00:04,  5.15it/s]
    478/499      0.206G     0.02532    0.007803      0.01635            1          320:
40%|####        | 16/40 [00:02<00:04,  5.06it/s]
    478/499      0.206G     0.02464    0.007901      0.01635            2          320:
40%|####        | 16/40 [00:03<00:04,  5.06it/s]
    478/499      0.206G     0.02464    0.007901      0.01635            2          320:
42%|####2       | 17/40 [00:03<00:04,  5.14it/s]
    478/499      0.206G     0.02508    0.007879      0.01817            2          320:
42%|####2       | 17/40 [00:03<00:04,  5.14it/s]
    478/499      0.206G     0.02508    0.007879      0.01817            2          320:
45%|####5       | 18/40 [00:03<00:04,  4.97it/s]
```

```
     478/499      0.206G     0.02477    0.008476      0.01874          4          320:
45%|####5     | 18/40 [00:03<00:04,  4.97it/s]
     478/499      0.206G     0.02477    0.008476      0.01874          4          320:
48%|####7     | 19/40 [00:03<00:04,  4.93it/s]
     478/499      0.206G      0.0239    0.008274      0.01841          1          320:
48%|####7     | 19/40 [00:03<00:04,  4.93it/s]
     478/499      0.206G      0.0239    0.008274      0.01841          1          320:
50%|#####     | 20/40 [00:03<00:04,  4.71it/s]
     478/499      0.206G     0.02323    0.008139      0.01827          1          320:
50%|#####     | 20/40 [00:03<00:04,  4.71it/s]
     478/499      0.206G     0.02323    0.008139      0.01827          1          320:
52%|#####2    | 21/40 [00:03<00:03,  4.87it/s]
     478/499      0.206G     0.02354    0.008413      0.01845          4          320:
52%|#####2    | 21/40 [00:04<00:03,  4.87it/s]
     478/499      0.206G     0.02354    0.008413      0.01845          4          320:
55%|#####5    | 22/40 [00:04<00:03,  4.88it/s]
     478/499      0.206G     0.02335    0.008611      0.01853          4          320:
55%|#####5    | 22/40 [00:04<00:03,  4.88it/s]
     478/499      0.206G     0.02335    0.008611      0.01853          4          320:
57%|#####7    | 23/40 [00:04<00:03,  4.73it/s]
     478/499      0.206G     0.02341    0.009131      0.01864          4          320:
57%|#####7    | 23/40 [00:04<00:03,  4.73it/s]
     478/499      0.206G     0.02341    0.009131      0.01864          4          320:
60%|######    | 24/40 [00:04<00:03,  4.83it/s]
     478/499      0.206G     0.02307    0.009039      0.01844          2          320:
60%|######    | 24/40 [00:04<00:03,  4.83it/s]
     478/499      0.206G     0.02307    0.009039      0.01844          2          320:
62%|######2   | 25/40 [00:04<00:03,  4.97it/s]
     478/499      0.206G     0.02239     0.00879      0.01815          1          320:
62%|######2   | 25/40 [00:05<00:03,  4.97it/s]
     478/499      0.206G     0.02239     0.00879      0.01815          1          320:
65%|######5   | 26/40 [00:05<00:02,  4.94it/s]
     478/499      0.206G     0.02332    0.008738      0.01849          2          320:
65%|######5   | 26/40 [00:05<00:02,  4.94it/s]
     478/499      0.206G     0.02332    0.008738      0.01849          2          320:
68%|######7   | 27/40 [00:05<00:02,  5.05it/s]
     478/499      0.206G     0.02291    0.008626      0.01833          1          320:
68%|######7   | 27/40 [00:05<00:02,  5.05it/s]
     478/499      0.206G     0.02291    0.008626      0.01833          1          320:
70%|#######   | 28/40 [00:05<00:02,  5.13it/s]
     478/499      0.206G     0.02243    0.008488      0.01821          1          320:
70%|#######   | 28/40 [00:05<00:02,  5.13it/s]
     478/499      0.206G     0.02243    0.008488      0.01821          1          320:
72%|#######2  | 29/40 [00:05<00:02,  5.30it/s]
     478/499      0.206G     0.02227    0.008597      0.01842          4          320:
72%|#######2  | 29/40 [00:05<00:02,  5.30it/s]
     478/499      0.206G     0.02227    0.008597      0.01842          4          320:
75%|#######5  | 30/40 [00:05<00:01,  5.18it/s]
```

```
   478/499      0.206G      0.02192    0.008543      0.01831          2          320:
75%|#######5  | 30/40 [00:05<00:01,  5.18it/s]
   478/499      0.206G      0.02192    0.008543      0.01831          2          320:
78%|#######7  | 31/40 [00:05<00:01,  5.36it/s]
   478/499      0.206G      0.02168    0.008367      0.01817          1          320:
78%|#######7  | 31/40 [00:06<00:01,  5.36it/s]
   478/499      0.206G      0.02168    0.008367      0.01817          1          320:
80%|########  | 32/40 [00:06<00:01,  5.48it/s]
   478/499      0.206G      0.02163    0.008301      0.01849          2          320:
80%|########  | 32/40 [00:06<00:01,  5.48it/s]
   478/499      0.206G      0.02163    0.008301      0.01849          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.44it/s]
   478/499      0.206G      0.02169    0.008414      0.01858          3          320:
82%|########2 | 33/40 [00:06<00:01,  5.44it/s]
   478/499      0.206G      0.02169    0.008414      0.01858          3          320:
85%|########5 | 34/40 [00:06<00:01,  5.40it/s]
   478/499      0.206G      0.02166    0.008381      0.01855          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.40it/s]
   478/499      0.206G      0.02166    0.008381      0.01855          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.50it/s]
   478/499      0.206G      0.02183    0.008494      0.01857          4          320:
88%|########7 | 35/40 [00:06<00:00,  5.50it/s]
   478/499      0.206G      0.02183    0.008494      0.01857          4          320:
90%|######### | 36/40 [00:06<00:00,  5.59it/s]
   478/499      0.206G      0.02185    0.008463      0.01857          2          320:
90%|######### | 36/40 [00:07<00:00,  5.59it/s]
   478/499      0.206G      0.02185    0.008463      0.01857          2          320:
92%|#########2| 37/40 [00:07<00:00,  5.49it/s]
   478/499      0.206G      0.02215    0.008624      0.01889          4          320:
92%|#########2| 37/40 [00:07<00:00,  5.49it/s]
   478/499      0.206G      0.02215    0.008624      0.01889          4          320:
95%|#########5| 38/40 [00:07<00:00,  5.47it/s]
   478/499      0.206G      0.02177    0.008551      0.01889          2          320:
95%|#########5| 38/40 [00:07<00:00,  5.47it/s]
   478/499      0.206G      0.02177    0.008551      0.01889          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.42it/s]
   478/499      0.206G      0.02219    0.008551      0.01879          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.42it/s]
   478/499      0.206G      0.02219    0.008551      0.01879          2          320:
100%|##########| 40/40 [00:07<00:00,  5.43it/s]
   478/499      0.206G      0.02219    0.008551      0.01879          2          320:
100%|##########| 40/40 [00:07<00:00,  5.29it/s]

                Class      Images  Instances           P          R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
                Class      Images  Instances           P          R      mAP50
mAP50-95:  10%|#             | 2/20 [00:00<00:01, 13.37it/s]
                Class      Images  Instances           P          R      mAP50
```

```
mAP50-95:  20%|##        | 4/20 [00:00<00:01, 15.80it/s]
              Class     Images  Instances          P         R      mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 16.84it/s]
              Class     Images  Instances          P         R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 17.37it/s]
              Class     Images  Instances          P         R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 17.64it/s]
              Class     Images  Instances          P         R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 17.85it/s]
              Class     Images  Instances          P         R      mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 17.20it/s]
              Class     Images  Instances          P         R      mAP50
mAP50-95:  85%|########5 | 17/20 [00:00<00:00, 17.97it/s]
              Class     Images  Instances          P         R      mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 17.99it/s]
              Class     Images  Instances          P         R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.34it/s]
                all         40         40      0.976     0.975      0.993
0.798

      Epoch    GPU_mem    box_loss    obj_loss    cls_loss  Instances        Size

  0%|            | 0/40 [00:00<?, ?it/s]
    479/499      0.206G    0.008067    0.004623     0.01443          1        320:
0%|            | 0/40 [00:00<?, ?it/s]
    479/499      0.206G    0.008067    0.004623     0.01443          1        320:
2%|2           | 1/40 [00:00<00:06,  6.35it/s]
    479/499      0.206G     0.01259    0.006674     0.01535          2        320:
2%|2           | 1/40 [00:00<00:06,  6.35it/s]
    479/499      0.206G     0.01259    0.006674     0.01535          2        320:
5%|5           | 2/40 [00:00<00:06,  6.02it/s]
    479/499      0.206G     0.01275     0.01004     0.01519          4        320:
5%|5           | 2/40 [00:00<00:06,  6.02it/s]
    479/499      0.206G     0.01275     0.01004     0.01519          4        320:
8%|7           | 3/40 [00:00<00:06,  5.93it/s]
    479/499      0.206G     0.01768     0.01113     0.01647          3        320:
8%|7           | 3/40 [00:00<00:06,  5.93it/s]
    479/499      0.206G     0.01768     0.01113     0.01647          3        320:
10%|#           | 4/40 [00:00<00:06,  5.86it/s]
    479/499      0.206G     0.01629     0.01078     0.01599          2        320:
10%|#           | 4/40 [00:00<00:06,  5.86it/s]
    479/499      0.206G     0.01629     0.01078     0.01599          2        320:
12%|#2          | 5/40 [00:00<00:05,  5.84it/s]
    479/499      0.206G     0.01684     0.01141     0.01664          4        320:
12%|#2          | 5/40 [00:01<00:05,  5.84it/s]
    479/499      0.206G     0.01684     0.01141     0.01664          4        320:
15%|#5          | 6/40 [00:01<00:06,  5.66it/s]
    479/499      0.206G     0.01798     0.01066     0.01766          2        320:
```

```
15%|#5          | 6/40 [00:01<00:06,  5.66it/s]
    479/499     0.206G    0.01798    0.01066    0.01766        2       320:
18%|#7          | 7/40 [00:01<00:06,  5.39it/s]
    479/499     0.206G    0.01698    0.009789   0.01764        1       320:
18%|#7          | 7/40 [00:01<00:06,  5.39it/s]
    479/499     0.206G    0.01698    0.009789   0.01764        1       320:
20%|##          | 8/40 [00:01<00:05,  5.68it/s]
    479/499     0.206G    0.01855    0.009642   0.01831        2       320:
20%|##          | 8/40 [00:01<00:05,  5.68it/s]
    479/499     0.206G    0.01855    0.009642   0.01831        2       320:
22%|##2         | 9/40 [00:01<00:05,  5.56it/s]
    479/499     0.206G    0.0194     0.01048    0.0189         4       320:
22%|##2         | 9/40 [00:01<00:05,  5.56it/s]
    479/499     0.206G    0.0194     0.01048    0.0189         4       320:
25%|##5         | 10/40 [00:01<00:05,  5.60it/s]
    479/499     0.206G    0.0196     0.01017    0.01903        2       320:
25%|##5         | 10/40 [00:01<00:05,  5.60it/s]
    479/499     0.206G    0.0196     0.01017    0.01903        2       320:
28%|##7         | 11/40 [00:01<00:05,  5.67it/s]
    479/499     0.206G    0.01853    0.009591   0.01924        1       320:
28%|##7         | 11/40 [00:02<00:05,  5.67it/s]
    479/499     0.206G    0.01853    0.009591   0.01924        1       320:
30%|###         | 12/40 [00:02<00:05,  5.42it/s]
    479/499     0.206G    0.01769    0.00912    0.01948        1       320:
30%|###         | 12/40 [00:02<00:05,  5.42it/s]
    479/499     0.206G    0.01769    0.00912    0.01948        1       320:
32%|###2        | 13/40 [00:02<00:04,  5.67it/s]
    479/499     0.206G    0.01799    0.008853   0.01967        2       320:
32%|###2        | 13/40 [00:02<00:04,  5.67it/s]
    479/499     0.206G    0.01799    0.008853   0.01967        2       320:
35%|###5        | 14/40 [00:02<00:04,  5.71it/s]
    479/499     0.206G    0.01824    0.008877   0.02012        2       320:
35%|###5        | 14/40 [00:02<00:04,  5.71it/s]
    479/499     0.206G    0.01824    0.008877   0.02012        2       320:
38%|###7        | 15/40 [00:02<00:04,  5.59it/s]
    479/499     0.206G    0.01805    0.008896   0.01974        2       320:
38%|###7        | 15/40 [00:02<00:04,  5.59it/s]
    479/499     0.206G    0.01805    0.008896   0.01974        2       320:
40%|####        | 16/40 [00:02<00:04,  5.64it/s]
    479/499     0.206G    0.01775    0.009019   0.02016        4       320:
40%|####        | 16/40 [00:03<00:04,  5.64it/s]
    479/499     0.206G    0.01775    0.009019   0.02016        4       320:
42%|####2       | 17/40 [00:03<00:04,  5.55it/s]
    479/499     0.206G    0.0176     0.008769   0.01982        2       320:
42%|####2       | 17/40 [00:03<00:04,  5.55it/s]
    479/499     0.206G    0.0176     0.008769   0.01982        2       320:
45%|####5       | 18/40 [00:03<00:03,  5.78it/s]
    479/499     0.206G    0.01726    0.008673   0.01957        2       320:
```

```
45%|####5        | 18/40 [00:03<00:03,  5.78it/s]
    479/499     0.206G     0.01726   0.008673   0.01957        2        320:
48%|####7        | 19/40 [00:03<00:03,  5.77it/s]
    479/499     0.206G     0.01895   0.008597   0.01948        2        320:
48%|####7        | 19/40 [00:03<00:03,  5.77it/s]
    479/499     0.206G     0.01895   0.008597   0.01948        2        320:
50%|#####        | 20/40 [00:03<00:03,  5.35it/s]
    479/499     0.206G     0.02031   0.00855    0.02003        2        320:
50%|#####        | 20/40 [00:03<00:03,  5.35it/s]
    479/499     0.206G     0.02031   0.00855    0.02003        2        320:
52%|#####2       | 21/40 [00:03<00:03,  5.34it/s]
    479/499     0.206G     0.02002   0.008563   0.02042        3        320:
52%|#####2       | 21/40 [00:03<00:03,  5.34it/s]
    479/499     0.206G     0.02002   0.008563   0.02042        3        320:
55%|#####5       | 22/40 [00:03<00:03,  5.19it/s]
    479/499     0.206G     0.0202    0.008759   0.02028        4        320:
55%|#####5       | 22/40 [00:04<00:03,  5.19it/s]
    479/499     0.206G     0.0202    0.008759   0.02028        4        320:
57%|#####7       | 23/40 [00:04<00:03,  5.23it/s]
    479/499     0.206G     0.02016   0.008665   0.02009        2        320:
57%|#####7       | 23/40 [00:04<00:03,  5.23it/s]
    479/499     0.206G     0.02016   0.008665   0.02009        2        320:
60%|######       | 24/40 [00:04<00:03,  5.19it/s]
    479/499     0.206G     0.02055   0.008667   0.01981        2        320:
60%|######       | 24/40 [00:04<00:03,  5.19it/s]
    479/499     0.206G     0.02055   0.008667   0.01981        2        320:
62%|######2      | 25/40 [00:04<00:02,  5.17it/s]
    479/499     0.206G     0.02039   0.008447   0.01956        1        320:
62%|######2      | 25/40 [00:04<00:02,  5.17it/s]
    479/499     0.206G     0.02039   0.008447   0.01956        1        320:
65%|######5      | 26/40 [00:04<00:02,  5.34it/s]
    479/499     0.206G     0.02056   0.008425   0.01961        3        320:
65%|######5      | 26/40 [00:04<00:02,  5.34it/s]
    479/499     0.206G     0.02056   0.008425   0.01961        3        320:
68%|######7      | 27/40 [00:04<00:02,  5.33it/s]
    479/499     0.206G     0.02014   0.00824    0.0193         1        320:
68%|######7      | 27/40 [00:05<00:02,  5.33it/s]
    479/499     0.206G     0.02014   0.00824    0.0193         1        320:
70%|#######      | 28/40 [00:05<00:02,  5.47it/s]
    479/499     0.206G     0.01974   0.008048   0.01907        1        320:
70%|#######      | 28/40 [00:05<00:02,  5.47it/s]
    479/499     0.206G     0.01974   0.008048   0.01907        1        320:
72%|#######2     | 29/40 [00:05<00:01,  5.57it/s]
    479/499     0.206G     0.01948   0.007958   0.01903        1        320:
72%|#######2     | 29/40 [00:05<00:01,  5.57it/s]
    479/499     0.206G     0.01948   0.007958   0.01903        1        320:
75%|#######5     | 30/40 [00:05<00:01,  5.52it/s]
    479/499     0.206G     0.0194    0.008038   0.01916        4        320:
```

```
75%|#######5   | 30/40 [00:05<00:01,  5.52it/s]
     479/499      0.206G      0.0194    0.008038     0.01916          4        320:
78%|#######7   | 31/40 [00:05<00:01,  5.56it/s]
     479/499      0.206G     0.01948     0.00801     0.01897          2        320:
78%|#######7   | 31/40 [00:05<00:01,  5.56it/s]
     479/499      0.206G     0.01948     0.00801     0.01897          2        320:
80%|########   | 32/40 [00:05<00:01,  5.63it/s]
     479/499      0.206G     0.01982     0.00812     0.01893          4        320:
80%|########   | 32/40 [00:05<00:01,  5.63it/s]
     479/499      0.206G     0.01982     0.00812     0.01893          4        320:
82%|########2  | 33/40 [00:05<00:01,  5.67it/s]
     479/499      0.206G     0.01964    0.008221     0.01901          4        320:
82%|########2  | 33/40 [00:06<00:01,  5.67it/s]
     479/499      0.206G     0.01964    0.008221     0.01901          4        320:
85%|########5  | 34/40 [00:06<00:01,  5.56it/s]
     479/499      0.206G      0.0198    0.008344     0.01904          4        320:
85%|########5  | 34/40 [00:06<00:01,  5.56it/s]
     479/499      0.206G      0.0198    0.008344     0.01904          4        320:
88%|########7  | 35/40 [00:06<00:00,  5.64it/s]
     479/499      0.206G     0.02008     0.00853     0.01923          4        320:
88%|########7  | 35/40 [00:06<00:00,  5.64it/s]
     479/499      0.206G     0.02008     0.00853     0.01923          4        320:
90%|######### | 36/40 [00:06<00:00,  5.54it/s]
     479/499      0.206G     0.02106    0.008552     0.01921          2        320:
90%|######### | 36/40 [00:06<00:00,  5.54it/s]
     479/499      0.206G     0.02106    0.008552     0.01921          2        320:
92%|#########2| 37/40 [00:06<00:00,  5.48it/s]
     479/499      0.206G     0.02085     0.00848     0.01911          2        320:
92%|#########2| 37/40 [00:06<00:00,  5.48it/s]
     479/499      0.206G     0.02085     0.00848     0.01911          2        320:
95%|#########5| 38/40 [00:06<00:00,  5.43it/s]
     479/499      0.206G     0.02058    0.008373     0.01894          1        320:
95%|#########5| 38/40 [00:07<00:00,  5.43it/s]
     479/499      0.206G     0.02058    0.008373     0.01894          1        320:
98%|#########7| 39/40 [00:07<00:00,  5.52it/s]
     479/499      0.206G     0.02051    0.008542      0.0189          4        320:
98%|#########7| 39/40 [00:07<00:00,  5.52it/s]
     479/499      0.206G     0.02051    0.008542      0.0189          4        320:
100%|##########| 40/40 [00:07<00:00,  5.60it/s]
     479/499      0.206G     0.02051    0.008542      0.0189          4        320:
100%|##########| 40/40 [00:07<00:00,  5.55it/s]


               Class      Images  Instances           P           R       mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
               Class      Images  Instances           P           R       mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 12.80it/s]
               Class      Images  Instances           P           R       mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:01, 15.37it/s]
```

```
                 Class      Images  Instances          P           R        mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 14.84it/s]
                 Class      Images  Instances          P           R        mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 16.04it/s]
                 Class      Images  Instances          P           R        mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 16.02it/s]
                 Class      Images  Instances          P           R        mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 16.73it/s]
                 Class      Images  Instances          P           R        mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 15.08it/s]
                 Class      Images  Instances          P           R        mAP50
mAP50-95:  80%|########    | 16/20 [00:01<00:00, 15.95it/s]
                 Class      Images  Instances          P           R        mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 17.15it/s]
                 Class      Images  Instances          P           R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.34it/s]
                   all         40          40       0.976       0.975       0.993
0.798

       Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
     480/499     0.206G    0.01959   0.007108    0.03285          2       320:
0%|           | 0/40 [00:00<?, ?it/s]
     480/499     0.206G    0.01959   0.007108    0.03285          2       320:
2%|2          | 1/40 [00:00<00:07,  5.33it/s]
     480/499     0.206G    0.02507   0.006908    0.02488          2       320:
2%|2          | 1/40 [00:00<00:07,  5.33it/s]
     480/499     0.206G    0.02507   0.006908    0.02488          2       320:
5%|5          | 2/40 [00:00<00:07,  5.30it/s]
     480/499     0.206G    0.02508   0.009643    0.02343          4       320:
5%|5          | 2/40 [00:00<00:07,  5.30it/s]
     480/499     0.206G    0.02508   0.009643    0.02343          4       320:
8%|7          | 3/40 [00:00<00:06,  5.32it/s]
     480/499     0.206G    0.02423     0.0108    0.02285          4       320:
8%|7          | 3/40 [00:00<00:06,  5.32it/s]
     480/499     0.206G    0.02423     0.0108    0.02285          4       320:
10%|#          | 4/40 [00:00<00:07,  4.57it/s]
     480/499     0.206G    0.02194    0.01018    0.02242          1       320:
10%|#          | 4/40 [00:01<00:07,  4.57it/s]
     480/499     0.206G    0.02194    0.01018    0.02242          1       320:
12%|#2         | 5/40 [00:01<00:07,  4.66it/s]
     480/499     0.206G    0.02208    0.01196    0.02193          4       320:
12%|#2         | 5/40 [00:01<00:07,  4.66it/s]
     480/499     0.206G    0.02208    0.01196    0.02193          4       320:
15%|#5         | 6/40 [00:01<00:07,  4.75it/s]
     480/499     0.206G    0.02739    0.01094    0.02333          2       320:
15%|#5         | 6/40 [00:01<00:07,  4.75it/s]
```

```
     480/499      0.206G      0.02739    0.01094      0.02333           2          320:
18%|#7           | 7/40 [00:01<00:06,  4.92it/s]
     480/499      0.206G      0.02961    0.01029      0.02403           2          320:
18%|#7           | 7/40 [00:01<00:06,  4.92it/s]
     480/499      0.206G      0.02961    0.01029      0.02403           2          320:
20%|##           | 8/40 [00:01<00:06,  4.80it/s]
     480/499      0.206G      0.0274    0.009533      0.02282           1          320:
20%|##           | 8/40 [00:01<00:06,  4.80it/s]
     480/499      0.206G      0.0274    0.009533      0.02282           1          320:
22%|##2          | 9/40 [00:01<00:06,  4.84it/s]
     480/499      0.206G      0.02894    0.01004      0.02265           4          320:
22%|##2          | 9/40 [00:02<00:06,  4.84it/s]
     480/499      0.206G      0.02894    0.01004      0.02265           4          320:
25%|##5          | 10/40 [00:02<00:06,  4.84it/s]
     480/499      0.206G      0.02806    0.009897     0.02231           2          320:
25%|##5          | 10/40 [00:02<00:06,  4.84it/s]
     480/499      0.206G      0.02806    0.009897     0.02231           2          320:
28%|##7          | 11/40 [00:02<00:06,  4.75it/s]
     480/499      0.206G      0.02696    0.009353     0.02179           1          320:
28%|##7          | 11/40 [00:02<00:06,  4.75it/s]
     480/499      0.206G      0.02696    0.009353     0.02179           1          320:
30%|###          | 12/40 [00:02<00:05,  4.85it/s]
     480/499      0.206G      0.02534    0.008853     0.02129           1          320:
30%|###          | 12/40 [00:02<00:05,  4.85it/s]
     480/499      0.206G      0.02534    0.008853     0.02129           1          320:
32%|###2         | 13/40 [00:02<00:05,  4.95it/s]
     480/499      0.206G      0.02579    0.009268     0.02122           4          320:
32%|###2         | 13/40 [00:02<00:05,  4.95it/s]
     480/499      0.206G      0.02579    0.009268     0.02122           4          320:
35%|###5         | 14/40 [00:02<00:05,  4.94it/s]
     480/499      0.206G      0.02499    0.008859     0.02084           1          320:
35%|###5         | 14/40 [00:03<00:05,  4.94it/s]
     480/499      0.206G      0.02499    0.008859     0.02084           1          320:
38%|###7         | 15/40 [00:03<00:05,  4.92it/s]
     480/499      0.206G      0.0244     0.008603     0.0204            1          320:
38%|###7         | 15/40 [00:03<00:05,  4.92it/s]
     480/499      0.206G      0.0244     0.008603     0.0204            1          320:
40%|####         | 16/40 [00:03<00:04,  5.04it/s]
     480/499      0.206G      0.02403    0.009018     0.02034           4          320:
40%|####         | 16/40 [00:03<00:04,  5.04it/s]
     480/499      0.206G      0.02403    0.009018     0.02034           4          320:
42%|####2        | 17/40 [00:03<00:04,  5.00it/s]
     480/499      0.206G      0.02365    0.009437     0.02003           4          320:
42%|####2        | 17/40 [00:03<00:04,  5.00it/s]
     480/499      0.206G      0.02365    0.009437     0.02003           4          320:
45%|####5        | 18/40 [00:03<00:04,  5.08it/s]
     480/499      0.206G      0.02306    0.009112     0.01966           1          320:
45%|####5        | 18/40 [00:03<00:04,  5.08it/s]
```

```
     480/499      0.206G      0.02306    0.009112      0.01966           1           320:
48%|####7     | 19/40 [00:03<00:03,  5.28it/s]
     480/499      0.206G      0.02289    0.009203      0.01963           2           320:
48%|####7     | 19/40 [00:04<00:03,  5.28it/s]
     480/499      0.206G      0.02289    0.009203      0.01963           2           320:
50%|#####     | 20/40 [00:04<00:03,  5.30it/s]
     480/499      0.206G      0.02252    0.009157      0.01952           2           320:
50%|#####     | 20/40 [00:04<00:03,  5.30it/s]
     480/499      0.206G      0.02252    0.009157      0.01952           2           320:
52%|#####2    | 21/40 [00:04<00:03,  5.16it/s]
     480/499      0.206G      0.02218    0.008954      0.01937           1           320:
52%|#####2    | 21/40 [00:04<00:03,  5.16it/s]
     480/499      0.206G      0.02218    0.008954      0.01937           1           320:
55%|#####5    | 22/40 [00:04<00:03,  5.34it/s]
     480/499      0.206G      0.02247    0.009378      0.01933           4           320:
55%|#####5    | 22/40 [00:04<00:03,  5.34it/s]
     480/499      0.206G      0.02247    0.009378      0.01933           4           320:
57%|#####7    | 23/40 [00:04<00:03,  5.27it/s]
     480/499      0.206G      0.02214    0.009189      0.01926           2           320:
57%|#####7    | 23/40 [00:04<00:03,  5.27it/s]
     480/499      0.206G      0.02214    0.009189      0.01926           2           320:
60%|######    | 24/40 [00:04<00:02,  5.47it/s]
     480/499      0.206G      0.02158    0.008913      0.01896           1           320:
60%|######    | 24/40 [00:04<00:02,  5.47it/s]
     480/499      0.206G      0.02158    0.008913      0.01896           1           320:
62%|######2   | 25/40 [00:04<00:02,  5.72it/s]
     480/499      0.206G       0.0223   0.008997      0.01976           2           320:
62%|######2   | 25/40 [00:05<00:02,  5.72it/s]
     480/499      0.206G       0.0223   0.008997      0.01976           2           320:
65%|######5   | 26/40 [00:05<00:02,  5.32it/s]
     480/499      0.206G      0.02263    0.009102      0.01993           3           320:
65%|######5   | 26/40 [00:05<00:02,  5.32it/s]
     480/499      0.206G      0.02263    0.009102      0.01993           3           320:
68%|######7   | 27/40 [00:05<00:02,  5.33it/s]
     480/499      0.206G      0.02354    0.00907       0.01983           3           320:
68%|######7   | 27/40 [00:05<00:02,  5.33it/s]
     480/499      0.206G      0.02354    0.00907       0.01983           3           320:
70%|#######   | 28/40 [00:05<00:02,  5.46it/s]
     480/499      0.206G      0.02396    0.009192      0.01997           2           320:
70%|#######   | 28/40 [00:05<00:02,  5.46it/s]
     480/499      0.206G      0.02396    0.009192      0.01997           2           320:
72%|#######2  | 29/40 [00:05<00:02,  5.41it/s]
     480/499      0.206G      0.02354    0.008997      0.01977           1           320:
72%|#######2  | 29/40 [00:05<00:02,  5.41it/s]
     480/499      0.206G      0.02354    0.008997      0.01977           1           320:
75%|#######5  | 30/40 [00:05<00:01,  5.52it/s]
     480/499      0.206G      0.02316    0.008873      0.01973           1           320:
75%|#######5  | 30/40 [00:06<00:01,  5.52it/s]
```

```
     480/499      0.206G     0.02316    0.008873    0.01973          1        320:
78%|#######7  | 31/40 [00:06<00:01,  5.61it/s]
     480/499      0.206G      0.0232    0.009021     0.0199          3        320:
78%|#######7  | 31/40 [00:06<00:01,  5.61it/s]
     480/499      0.206G      0.0232    0.009021     0.0199          3        320:
80%|########  | 32/40 [00:06<00:01,  5.50it/s]
     480/499      0.206G     0.02314    0.009183    0.01992          4        320:
80%|########  | 32/40 [00:06<00:01,  5.50it/s]
     480/499      0.206G     0.02314    0.009183    0.01992          4        320:
82%|########2 | 33/40 [00:06<00:01,  5.59it/s]
     480/499      0.206G     0.02363    0.009109    0.01982          2        320:
82%|########2 | 33/40 [00:06<00:01,  5.59it/s]
     480/499      0.206G     0.02363    0.009109    0.01982          2        320:
85%|########5 | 34/40 [00:06<00:01,  5.37it/s]
     480/499      0.206G     0.02383    0.009372    0.01978          4        320:
85%|########5 | 34/40 [00:06<00:01,  5.37it/s]
     480/499      0.206G     0.02383    0.009372    0.01978          4        320:
88%|########7 | 35/40 [00:06<00:00,  5.34it/s]
     480/499      0.206G     0.02434    0.009432    0.01994          3        320:
88%|########7 | 35/40 [00:06<00:00,  5.34it/s]
     480/499      0.206G     0.02434    0.009432    0.01994          3        320:
90%|######### | 36/40 [00:06<00:00,  5.47it/s]
     480/499      0.206G     0.02464    0.009515     0.0199          4        320:
90%|######### | 36/40 [00:07<00:00,  5.47it/s]
     480/499      0.206G     0.02464    0.009515     0.0199          4        320:
92%|#########2| 37/40 [00:07<00:00,  5.43it/s]
     480/499      0.206G     0.02419    0.009342    0.01969          1        320:
92%|#########2| 37/40 [00:07<00:00,  5.43it/s]
     480/499      0.206G     0.02419    0.009342    0.01969          1        320:
95%|#########5| 38/40 [00:07<00:00,  5.52it/s]
     480/499      0.206G     0.02375    0.009163    0.01946          1        320:
95%|#########5| 38/40 [00:07<00:00,  5.52it/s]
     480/499      0.206G     0.02375    0.009163    0.01946          1        320:
98%|#########7| 39/40 [00:07<00:00,  5.61it/s]
     480/499      0.206G     0.02388    0.009269    0.01945          4        320:
98%|#########7| 39/40 [00:07<00:00,  5.61it/s]
     480/499      0.206G     0.02388    0.009269    0.01945          4        320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]
     480/499      0.206G     0.02388    0.009269    0.01945          4        320:
100%|##########| 40/40 [00:07<00:00,  5.22it/s]

                 Class      Images  Instances          P          R       mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
                 Class      Images  Instances          P          R       mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:01, 16.71it/s]
                 Class      Images  Instances          P          R       mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:00, 17.60it/s]
                 Class      Images  Instances          P          R       mAP50
```

```
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 17.91it/s]
                Class      Images  Instances           P           R       mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 18.04it/s]
                Class      Images  Instances           P           R       mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 17.11it/s]
                Class      Images  Instances           P           R       mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 16.75it/s]
                Class      Images  Instances           P           R       mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 17.22it/s]
                Class      Images  Instances           P           R       mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 17.55it/s]
                Class      Images  Instances           P           R       mAP50
mAP50-95:  95%|#########5 | 19/20 [00:01<00:00, 17.51it/s]
                Class      Images  Instances           P           R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.08it/s]
                  all         40         40       0.979       0.975       0.991
0.8

      Epoch    GPU_mem    box_loss    obj_loss    cls_loss   Instances        Size

  0%|            | 0/40 [00:00<?, ?it/s]
    481/499     0.206G     0.01065    0.003918      0.0107           1        320:
0%|            | 0/40 [00:00<?, ?it/s]
    481/499     0.206G     0.01065    0.003918      0.0107           1        320:
2%|2           | 1/40 [00:00<00:06,  5.71it/s]
    481/499     0.206G    0.009096     0.00327     0.01309           1        320:
2%|2           | 1/40 [00:00<00:06,  5.71it/s]
    481/499     0.206G    0.009096     0.00327     0.01309           1        320:
5%|5           | 2/40 [00:00<00:06,  5.50it/s]
    481/499     0.206G     0.01859    0.004795      0.0157           2        320:
5%|5           | 2/40 [00:00<00:06,  5.50it/s]
    481/499     0.206G     0.01859    0.004795      0.0157           2        320:
8%|7           | 3/40 [00:00<00:06,  5.64it/s]
    481/499     0.206G      0.0188     0.00481     0.01516           1        320:
8%|7           | 3/40 [00:00<00:06,  5.64it/s]
    481/499     0.206G      0.0188     0.00481     0.01516           1        320:
10%|#           | 4/40 [00:00<00:06,  5.61it/s]
    481/499     0.206G     0.01613    0.004622     0.01543           1        320:
10%|#           | 4/40 [00:00<00:06,  5.61it/s]
    481/499     0.206G     0.01613    0.004622     0.01543           1        320:
12%|#2          | 5/40 [00:00<00:06,  5.75it/s]
    481/499     0.206G     0.01512    0.004407     0.01512           1        320:
12%|#2          | 5/40 [00:01<00:06,  5.75it/s]
    481/499     0.206G     0.01512    0.004407     0.01512           1        320:
15%|#5          | 6/40 [00:01<00:05,  5.95it/s]
    481/499     0.206G     0.01394    0.004233     0.01509           1        320:
15%|#5          | 6/40 [00:01<00:05,  5.95it/s]
    481/499     0.206G     0.01394    0.004233     0.01509           1        320:
```

```
18%|#7          | 7/40 [00:01<00:05,  5.83it/s]
    481/499      0.206G     0.01735    0.004563     0.0157       2        320:
18%|#7          | 7/40 [00:01<00:05,  5.83it/s]
    481/499      0.206G     0.01735    0.004563     0.0157       2        320:
20%|##          | 8/40 [00:01<00:05,  5.71it/s]
    481/499      0.206G     0.01643    0.004873    0.01593       2        320:
20%|##          | 8/40 [00:01<00:05,  5.71it/s]
    481/499      0.206G     0.01643    0.004873    0.01593       2        320:
22%|##2         | 9/40 [00:01<00:05,  5.59it/s]
    481/499      0.206G     0.01855    0.005642    0.01717       4        320:
22%|##2         | 9/40 [00:01<00:05,  5.59it/s]
    481/499      0.206G     0.01855    0.005642    0.01717       4        320:
25%|##5         | 10/40 [00:01<00:05,  5.51it/s]
    481/499      0.206G     0.01821    0.005745     0.0169       2        320:
25%|##5         | 10/40 [00:01<00:05,  5.51it/s]
    481/499      0.206G     0.01821    0.005745     0.0169       2        320:
28%|##7         | 11/40 [00:01<00:05,  5.60it/s]
    481/499      0.206G     0.01945    0.006197    0.01708       4        320:
28%|##7         | 11/40 [00:02<00:05,  5.60it/s]
    481/499      0.206G     0.01945    0.006197    0.01708       4        320:
30%|###         | 12/40 [00:02<00:05,  5.37it/s]
    481/499      0.206G     0.02022    0.006545    0.01833       2        320:
30%|###         | 12/40 [00:02<00:05,  5.37it/s]
    481/499      0.206G     0.02022    0.006545    0.01833       2        320:
32%|###2        | 13/40 [00:02<00:05,  5.34it/s]
    481/499      0.206G     0.02014    0.006837    0.01972       4        320:
32%|###2        | 13/40 [00:02<00:05,  5.34it/s]
    481/499      0.206G     0.02014    0.006837    0.01972       4        320:
35%|###5        | 14/40 [00:02<00:04,  5.48it/s]
    481/499      0.206G     0.01941    0.006835    0.01936       2        320:
35%|###5        | 14/40 [00:02<00:04,  5.48it/s]
    481/499      0.206G     0.01941    0.006835    0.01936       2        320:
38%|###7        | 15/40 [00:02<00:04,  5.43it/s]
    481/499      0.206G      0.0192    0.006858    0.01906       2        320:
38%|###7        | 15/40 [00:02<00:04,  5.43it/s]
    481/499      0.206G      0.0192    0.006858    0.01906       2        320:
40%|####        | 16/40 [00:02<00:04,  5.67it/s]
    481/499      0.206G     0.01837    0.006661    0.01871       1        320:
40%|####        | 16/40 [00:03<00:04,  5.67it/s]
    481/499      0.206G     0.01837    0.006661    0.01871       1        320:
42%|####2       | 17/40 [00:03<00:04,  5.57it/s]
    481/499      0.206G     0.01885    0.007273    0.01881       4        320:
42%|####2       | 17/40 [00:03<00:04,  5.57it/s]
    481/499      0.206G     0.01885    0.007273    0.01881       4        320:
45%|####5       | 18/40 [00:03<00:03,  5.64it/s]
    481/499      0.206G     0.01827    0.007248    0.01845       2        320:
45%|####5       | 18/40 [00:03<00:03,  5.64it/s]
    481/499      0.206G     0.01827    0.007248    0.01845       2        320:
```

```
48%|####7      | 19/40 [00:03<00:03,  5.52it/s]
   481/499    0.206G    0.01774   0.007313    0.01878        2        320:
48%|####7      | 19/40 [00:03<00:03,  5.52it/s]
   481/499    0.206G    0.01774   0.007313    0.01878        2        320:
50%|#####      | 20/40 [00:03<00:03,  5.76it/s]
   481/499    0.206G    0.01839   0.007673    0.01885        4        320:
50%|#####      | 20/40 [00:03<00:03,  5.76it/s]
   481/499    0.206G    0.01839   0.007673    0.01885        4        320:
52%|#####2     | 21/40 [00:03<00:03,  5.63it/s]
   481/499    0.206G    0.01977   0.00782     0.01878        2        320:
52%|#####2     | 21/40 [00:03<00:03,  5.63it/s]
   481/499    0.206G    0.01977   0.00782     0.01878        2        320:
55%|#####5     | 22/40 [00:03<00:03,  5.46it/s]
   481/499    0.206G    0.01944   0.007655    0.01851        1        320:
55%|#####5     | 22/40 [00:04<00:03,  5.46it/s]
   481/499    0.206G    0.01944   0.007655    0.01851        1        320:
57%|#####7     | 23/40 [00:04<00:03,  5.33it/s]
   481/499    0.206G    0.01902   0.007662    0.01868        2        320:
57%|#####7     | 23/40 [00:04<00:03,  5.33it/s]
   481/499    0.206G    0.01902   0.007662    0.01868        2        320:
60%|######     | 24/40 [00:04<00:02,  5.47it/s]
   481/499    0.206G    0.01863   0.007555    0.01857        2        320:
60%|######     | 24/40 [00:04<00:02,  5.47it/s]
   481/499    0.206G    0.01863   0.007555    0.01857        2        320:
62%|######2    | 25/40 [00:04<00:02,  5.43it/s]
   481/499    0.206G    0.01831   0.007606    0.01836        2        320:
62%|######2    | 25/40 [00:04<00:02,  5.43it/s]
   481/499    0.206G    0.01831   0.007606    0.01836        2        320:
65%|######5    | 26/40 [00:04<00:02,  5.50it/s]
   481/499    0.206G    0.01876   0.007619    0.01897        2        320:
65%|######5    | 26/40 [00:04<00:02,  5.50it/s]
   481/499    0.206G    0.01876   0.007619    0.01897        2        320:
68%|######7    | 27/40 [00:04<00:02,  5.63it/s]
   481/499    0.206G    0.01838   0.007452    0.01881        1        320:
68%|######7    | 27/40 [00:05<00:02,  5.63it/s]
   481/499    0.206G    0.01838   0.007452    0.01881        1        320:
70%|#######    | 28/40 [00:05<00:02,  5.38it/s]
   481/499    0.206G    0.01977   0.007436    0.01896        2        320:
70%|#######    | 28/40 [00:05<00:02,  5.38it/s]
   481/499    0.206G    0.01977   0.007436    0.01896        2        320:
72%|#######2   | 29/40 [00:05<00:01,  5.50it/s]
   481/499    0.206G    0.01946   0.007359    0.01898        2        320:
72%|#######2   | 29/40 [00:05<00:01,  5.50it/s]
   481/499    0.206G    0.01946   0.007359    0.01898        2        320:
75%|#######5   | 30/40 [00:05<00:01,  5.45it/s]
   481/499    0.206G    0.01926   0.007244    0.01889        1        320:
75%|#######5   | 30/40 [00:05<00:01,  5.45it/s]
   481/499    0.206G    0.01926   0.007244    0.01889        1        320:
```

```
78%|#######7  | 31/40 [00:05<00:01,  5.68it/s]
     481/499      0.206G     0.01902    0.007318     0.01983           2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.68it/s]
     481/499      0.206G     0.01902    0.007318     0.01983           2        320:
80%|########  | 32/40 [00:05<00:01,  5.57it/s]
     481/499      0.206G     0.01917    0.007497     0.02017           4        320:
80%|########  | 32/40 [00:05<00:01,  5.57it/s]
     481/499      0.206G     0.01917    0.007497     0.02017           4        320:
82%|########2 | 33/40 [00:05<00:01,  5.50it/s]
     481/499      0.206G      0.0189    0.007363     0.01988           1        320:
82%|########2 | 33/40 [00:06<00:01,  5.50it/s]
     481/499      0.206G      0.0189    0.007363     0.01988           1        320:
85%|########5 | 34/40 [00:06<00:01,  5.73it/s]
     481/499      0.206G     0.01903    0.007531     0.01995           4        320:
85%|########5 | 34/40 [00:06<00:01,  5.73it/s]
     481/499      0.206G     0.01903    0.007531     0.01995           4        320:
88%|########7 | 35/40 [00:06<00:00,  5.32it/s]
     481/499      0.206G     0.01928    0.007714     0.01997           4        320:
88%|########7 | 35/40 [00:06<00:00,  5.32it/s]
     481/499      0.206G     0.01928    0.007714     0.01997           4        320:
90%|######### | 36/40 [00:06<00:00,  5.46it/s]
     481/499      0.206G     0.01954    0.008028     0.02003           4        320:
90%|######### | 36/40 [00:06<00:00,  5.46it/s]
     481/499      0.206G     0.01954    0.008028     0.02003           4        320:
92%|#########2| 37/40 [00:06<00:00,  5.54it/s]
     481/499      0.206G     0.01981    0.008059     0.01989           2        320:
92%|#########2| 37/40 [00:06<00:00,  5.54it/s]
     481/499      0.206G     0.01981    0.008059     0.01989           2        320:
95%|#########5| 38/40 [00:06<00:00,  5.47it/s]
     481/499      0.206G     0.02066    0.008149     0.01987           2        320:
95%|#########5| 38/40 [00:07<00:00,  5.47it/s]
     481/499      0.206G     0.02066    0.008149     0.01987           2        320:
98%|#########7| 39/40 [00:07<00:00,  5.24it/s]
     481/499      0.206G     0.02038    0.008021      0.0197           1        320:
98%|#########7| 39/40 [00:07<00:00,  5.24it/s]
     481/499      0.206G     0.02038    0.008021      0.0197           1        320:
100%|##########| 40/40 [00:07<00:00,  5.32it/s]
     481/499      0.206G     0.02038    0.008021      0.0197           1        320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]


            Class      Images  Instances          P          R      mAP50
mAP50-95:    0%|            | 0/20 [00:00<?, ?it/s]
            Class      Images  Instances          P          R      mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:01, 12.80it/s]
            Class      Images  Instances          P          R      mAP50
mAP50-95:   20%|##         | 4/20 [00:00<00:01, 12.41it/s]
            Class      Images  Instances          P          R      mAP50
mAP50-95:   30%|###        | 6/20 [00:00<00:00, 14.09it/s]
```

```
            Class       Images  Instances           P           R       mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 14.78it/s]
            Class       Images  Instances           P           R       mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 14.57it/s]
            Class       Images  Instances           P           R       mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 14.14it/s]
            Class       Images  Instances           P           R       mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 14.92it/s]
            Class       Images  Instances           P           R       mAP50
mAP50-95:  80%|########    | 16/20 [00:01<00:00, 14.71it/s]
            Class       Images  Instances           P           R       mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.67it/s]
            Class       Images  Instances           P           R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.77it/s]
            Class       Images  Instances           P           R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.83it/s]
              all          40          40       0.977       0.975        0.99
0.794

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    482/499     0.206G    0.01086   0.006759    0.01507          2       320:
0%|           | 0/40 [00:00<?, ?it/s]
    482/499     0.206G    0.01086   0.006759    0.01507          2       320:
2%|2         | 1/40 [00:00<00:07,  5.28it/s]
    482/499     0.206G     0.0265    0.00812    0.02546          3       320:
2%|2         | 1/40 [00:00<00:07,  5.28it/s]
    482/499     0.206G     0.0265    0.00812    0.02546          3       320:
5%|5         | 2/40 [00:00<00:07,  5.06it/s]
    482/499     0.206G    0.02433    0.01008     0.0222          4       320:
5%|5         | 2/40 [00:00<00:07,  5.06it/s]
    482/499     0.206G    0.02433    0.01008     0.0222          4       320:
8%|7         | 3/40 [00:00<00:07,  4.99it/s]
    482/499     0.206G    0.02397   0.009199    0.02137          2       320:
8%|7         | 3/40 [00:00<00:07,  4.99it/s]
    482/499     0.206G    0.02397   0.009199    0.02137          2       320:
10%|#         | 4/40 [00:00<00:07,  4.96it/s]
    482/499     0.206G    0.02141   0.007983    0.02114          1       320:
10%|#         | 4/40 [00:00<00:07,  4.96it/s]
    482/499     0.206G    0.02141   0.007983    0.02114          1       320:
12%|#2        | 5/40 [00:00<00:06,  5.09it/s]
    482/499     0.206G     0.0208   0.008831    0.02108          4       320:
12%|#2        | 5/40 [00:01<00:06,  5.09it/s]
    482/499     0.206G     0.0208   0.008831    0.02108          4       320:
15%|#5        | 6/40 [00:01<00:06,  5.17it/s]
    482/499     0.206G    0.02068   0.008738    0.02149          2       320:
15%|#5        | 6/40 [00:01<00:06,  5.17it/s]
```

```
   482/499      0.206G    0.02068    0.008738     0.02149        2         320:
18%|#7         | 7/40 [00:01<00:06,  5.07it/s]
   482/499      0.206G    0.01809    0.007749     0.01881        0         320:
18%|#7         | 7/40 [00:01<00:06,  5.07it/s]
   482/499      0.206G    0.01809    0.007749     0.01881        0         320:
20%|##         | 8/40 [00:01<00:05,  5.43it/s]
   482/499      0.206G    0.01709    0.007231     0.01831        1         320:
20%|##         | 8/40 [00:01<00:05,  5.43it/s]
   482/499      0.206G    0.01709    0.007231     0.01831        1         320:
22%|##2        | 9/40 [00:01<00:05,  5.70it/s]
   482/499      0.206G    0.01656    0.006809     0.01793        1         320:
22%|##2        | 9/40 [00:01<00:05,  5.70it/s]
   482/499      0.206G    0.01656    0.006809     0.01793        1         320:
25%|##5        | 10/40 [00:01<00:05,  5.56it/s]
   482/499      0.206G    0.01708    0.007363     0.01782        4         320:
25%|##5        | 10/40 [00:02<00:05,  5.56it/s]
   482/499      0.206G    0.01707    0.007469     0.01746        2         320:
28%|##7        | 11/40 [00:02<00:05,  5.64it/s]
   482/499      0.206G    0.01707    0.007469     0.01746        2         320:
28%|##7        | 11/40 [00:02<00:05,  5.64it/s]
   482/499      0.206G    0.01707    0.007469     0.01746        2         320:
30%|###        | 12/40 [00:02<00:04,  5.69it/s]
   482/499      0.206G    0.01727    0.007411     0.01754        2         320:
30%|###        | 12/40 [00:02<00:04,  5.69it/s]
   482/499      0.206G    0.01727    0.007411     0.01754        2         320:
32%|###2       | 13/40 [00:02<00:04,  5.71it/s]
   482/499      0.206G    0.01604    0.00694      0.01629        0         320:
32%|###2       | 13/40 [00:02<00:04,  5.71it/s]
   482/499      0.206G    0.01604    0.00694      0.01629        0         320:
35%|###5       | 14/40 [00:02<00:04,  5.90it/s]
   482/499      0.206G    0.01651    0.007551     0.01635        4         320:
35%|###5       | 14/40 [00:02<00:04,  5.90it/s]
   482/499      0.206G    0.01651    0.007551     0.01635        4         320:
38%|###7       | 15/40 [00:02<00:04,  5.88it/s]
   482/499      0.206G    0.01614    0.007237     0.01609        1         320:
38%|###7       | 15/40 [00:02<00:04,  5.88it/s]
   482/499      0.206G    0.01614    0.007237     0.01609        1         320:
40%|####       | 16/40 [00:02<00:04,  5.84it/s]
   482/499      0.206G    0.01691    0.007954     0.01633        4         320:
40%|####       | 16/40 [00:03<00:04,  5.84it/s]
   482/499      0.206G    0.01691    0.007954     0.01633        4         320:
42%|####2      | 17/40 [00:03<00:03,  5.83it/s]
   482/499      0.206G    0.01735    0.00793      0.01642        2         320:
42%|####2      | 17/40 [00:03<00:03,  5.83it/s]
   482/499      0.206G    0.01735    0.00793      0.01642        2         320:
45%|####5      | 18/40 [00:03<00:03,  5.83it/s]
   482/499      0.206G    0.01757    0.008179     0.01658        4         320:
45%|####5      | 18/40 [00:03<00:03,  5.83it/s]
```

```
    482/499      0.206G     0.01757    0.008179     0.01658          4          320:
48%|####7     | 19/40 [00:03<00:03,  5.52it/s]
    482/499      0.206G     0.01749     0.00811     0.01656          2          320:
48%|####7     | 19/40 [00:03<00:03,  5.52it/s]
    482/499      0.206G     0.01749     0.00811     0.01656          2          320:
50%|#####     | 20/40 [00:03<00:03,  5.61it/s]
    482/499      0.206G     0.01828    0.008014     0.01651          2          320:
50%|#####     | 20/40 [00:03<00:03,  5.61it/s]
    482/499      0.206G     0.01828    0.008014     0.01651          2          320:
52%|#####2    | 21/40 [00:03<00:03,  5.38it/s]
    482/499      0.206G     0.01843    0.008154      0.0173          4          320:
52%|#####2    | 21/40 [00:03<00:03,  5.38it/s]
    482/499      0.206G     0.01843    0.008154      0.0173          4          320:
55%|#####5    | 22/40 [00:03<00:03,  5.48it/s]
    482/499      0.206G     0.01781    0.007952      0.0171          1          320:
55%|#####5    | 22/40 [00:04<00:03,  5.48it/s]
    482/499      0.206G     0.01781    0.007952      0.0171          1          320:
57%|#####7    | 23/40 [00:04<00:03,  5.44it/s]
    482/499      0.206G     0.01762    0.007846      0.0171          2          320:
57%|#####7    | 23/40 [00:04<00:03,  5.44it/s]
    482/499      0.206G     0.01762    0.007846      0.0171          2          320:
60%|######    | 24/40 [00:04<00:02,  5.69it/s]
    482/499      0.206G     0.01752    0.008098     0.01716          4          320:
60%|######    | 24/40 [00:04<00:02,  5.69it/s]
    482/499      0.206G     0.01752    0.008098     0.01716          4          320:
62%|######2   | 25/40 [00:04<00:02,  5.55it/s]
    482/499      0.206G     0.01767    0.008471     0.01714          4          320:
62%|######2   | 25/40 [00:04<00:02,  5.55it/s]
    482/499      0.206G     0.01767    0.008471     0.01714          4          320:
65%|######5   | 26/40 [00:04<00:02,  5.48it/s]
    482/499      0.206G     0.01747    0.008293     0.01706          1          320:
65%|######5   | 26/40 [00:04<00:02,  5.48it/s]
    482/499      0.206G     0.01747    0.008293     0.01706          1          320:
68%|######7   | 27/40 [00:04<00:02,  5.42it/s]
    482/499      0.206G      0.0183    0.008331     0.01747          2          320:
68%|######7   | 27/40 [00:05<00:02,  5.42it/s]
    482/499      0.206G      0.0183    0.008331     0.01747          2          320:
70%|#######   | 28/40 [00:05<00:02,  5.53it/s]
    482/499      0.206G     0.01804    0.008302     0.01728          2          320:
70%|#######   | 28/40 [00:05<00:02,  5.53it/s]
    482/499      0.206G     0.01804    0.008302     0.01728          2          320:
72%|#######2  | 29/40 [00:05<00:01,  5.62it/s]
    482/499      0.206G     0.01806     0.00826     0.01729          1          320:
72%|#######2  | 29/40 [00:05<00:01,  5.62it/s]
    482/499      0.206G     0.01806     0.00826     0.01729          1          320:
75%|#######5  | 30/40 [00:05<00:01,  5.66it/s]
    482/499      0.206G     0.01835    0.008217     0.01722          2          320:
75%|#######5  | 30/40 [00:05<00:01,  5.66it/s]
```

```
   482/499     0.206G    0.01835    0.008217    0.01722         2         320:
78%|#######7  | 31/40 [00:05<00:01,  5.73it/s]
   482/499     0.206G     0.0184    0.008174    0.01756         2         320:
78%|#######7  | 31/40 [00:05<00:01,  5.73it/s]
   482/499     0.206G     0.0184    0.008174    0.01756         2         320:
80%|########  | 32/40 [00:05<00:01,  5.46it/s]
   482/499     0.206G    0.01813    0.008107    0.01743         1         320:
80%|########  | 32/40 [00:05<00:01,  5.46it/s]
   482/499     0.206G    0.01813    0.008107    0.01743         1         320:
82%|########2 | 33/40 [00:05<00:01,  5.39it/s]
   482/499     0.206G    0.01782    0.007987    0.01728         1         320:
82%|########2 | 33/40 [00:06<00:01,  5.39it/s]
   482/499     0.206G    0.01782    0.007987    0.01728         1         320:
85%|########5 | 34/40 [00:06<00:01,  5.52it/s]
   482/499     0.206G    0.01801    0.008002    0.01734         2         320:
85%|########5 | 34/40 [00:06<00:01,  5.52it/s]
   482/499     0.206G    0.01801    0.008002    0.01734         2         320:
88%|########7 | 35/40 [00:06<00:00,  5.46it/s]
   482/499     0.206G    0.01899    0.008011    0.01748         2         320:
88%|########7 | 35/40 [00:06<00:00,  5.46it/s]
   482/499     0.206G    0.01899    0.008011    0.01748         2         320:
90%|######### | 36/40 [00:06<00:00,  5.42it/s]
   482/499     0.206G    0.01954    0.008222     0.0178         4         320:
90%|######### | 36/40 [00:06<00:00,  5.42it/s]
   482/499     0.206G    0.01954    0.008222     0.0178         4         320:
92%|#########2| 37/40 [00:06<00:00,  5.52it/s]
   482/499     0.206G    0.01938    0.008097    0.01768         1         320:
92%|#########2| 37/40 [00:06<00:00,  5.52it/s]
   482/499     0.206G    0.01938    0.008097    0.01768         1         320:
95%|#########5| 38/40 [00:06<00:00,  5.60it/s]
   482/499     0.206G    0.01933    0.008099    0.01812         2         320:
95%|#########5| 38/40 [00:07<00:00,  5.60it/s]
   482/499     0.206G    0.01933    0.008099    0.01812         2         320:
98%|#########7| 39/40 [00:07<00:00,  5.51it/s]
   482/499     0.206G    0.01935    0.008268    0.01818         4         320:
98%|#########7| 39/40 [00:07<00:00,  5.51it/s]
   482/499     0.206G    0.01935    0.008268    0.01818         4         320:
100%|##########| 40/40 [00:07<00:00,  5.59it/s]
   482/499     0.206G    0.01935    0.008268    0.01818         4         320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]

              Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|             | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:00, 18.29it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:00, 16.86it/s]
              Class     Images  Instances          P          R      mAP50
```

```
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 17.34it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 16.77it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 17.29it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 17.60it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 17.82it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########  | 16/20 [00:00<00:00, 16.43it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.09it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.78it/s]
                all         40         40      0.977      0.975       0.99
0.794


      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    483/499     0.206G    0.00871   0.007754    0.01351          2       320:
0%|           | 0/40 [00:00<?, ?it/s]
    483/499     0.206G    0.00871   0.007754    0.01351          2       320:
2%|2         | 1/40 [00:00<00:06,  6.39it/s]
    483/499     0.206G   0.007544    0.00528    0.01313          1       320:
2%|2         | 1/40 [00:00<00:06,  6.39it/s]
    483/499     0.206G   0.007544    0.00528    0.01313          1       320:
5%|5         | 2/40 [00:00<00:06,  6.04it/s]
    483/499     0.206G   0.008668   0.004645     0.0127          1       320:
5%|5         | 2/40 [00:00<00:06,  6.04it/s]
    483/499     0.206G   0.008668   0.004645     0.0127          1       320:
8%|7         | 3/40 [00:00<00:06,  6.15it/s]
    483/499     0.206G    0.01228   0.005379    0.01541          2       320:
8%|7         | 3/40 [00:00<00:06,  6.15it/s]
    483/499     0.206G    0.01228   0.005379    0.01541          2       320:
10%|#         | 4/40 [00:00<00:05,  6.02it/s]
    483/499     0.206G    0.01234   0.004927    0.01546          1       320:
10%|#         | 4/40 [00:00<00:05,  6.02it/s]
    483/499     0.206G    0.01234   0.004927    0.01546          1       320:
12%|#2        | 5/40 [00:00<00:06,  5.75it/s]
    483/499     0.206G    0.01557   0.005601     0.0155          2       320:
12%|#2        | 5/40 [00:01<00:06,  5.75it/s]
    483/499     0.206G    0.01557   0.005601     0.0155          2       320:
15%|#5        | 6/40 [00:01<00:06,  5.58it/s]
    483/499     0.206G    0.01446   0.005652    0.01537          2       320:
15%|#5        | 6/40 [00:01<00:06,  5.58it/s]
    483/499     0.206G    0.01446   0.005652    0.01537          2       320:
```

```
18%|#7         | 7/40 [00:01<00:05,  5.82it/s]
    483/499    0.206G    0.01955    0.005555    0.01589        2        320:
18%|#7         | 7/40 [00:01<00:05,  5.82it/s]
    483/499    0.206G    0.01955    0.005555    0.01589        2        320:
20%|##         | 8/40 [00:01<00:05,  5.50it/s]
    483/499    0.206G    0.02003    0.006379    0.01631        4        320:
20%|##         | 8/40 [00:01<00:05,  5.50it/s]
    483/499    0.206G    0.02003    0.006379    0.01631        4        320:
22%|##2        | 9/40 [00:01<00:05,  5.57it/s]
    483/499    0.206G    0.01871    0.006048    0.01611        1        320:
22%|##2        | 9/40 [00:01<00:05,  5.57it/s]
    483/499    0.206G    0.01871    0.006048    0.01611        1        320:
25%|##5        | 10/40 [00:01<00:05,  5.64it/s]
    483/499    0.206G    0.02028    0.006466    0.01665        2        320:
25%|##5        | 10/40 [00:01<00:05,  5.64it/s]
    483/499    0.206G    0.02028    0.006466    0.01665        2        320:
28%|##7        | 11/40 [00:01<00:05,  5.41it/s]
    483/499    0.206G    0.02036    0.007174    0.01691        4        320:
28%|##7        | 11/40 [00:02<00:05,  5.41it/s]
    483/499    0.206G    0.02036    0.007174    0.01691        4        320:
30%|###        | 12/40 [00:02<00:05,  5.13it/s]
    483/499    0.206G    0.01981    0.007515    0.01685        4        320:
30%|###        | 12/40 [00:02<00:05,  5.13it/s]
    483/499    0.206G    0.01981    0.007515    0.01685        4        320:
32%|###2       | 13/40 [00:02<00:05,  5.19it/s]
    483/499    0.206G    0.0199    0.007205    0.01702        1        320:
32%|###2       | 13/40 [00:02<00:05,  5.19it/s]
    483/499    0.206G    0.0199    0.007205    0.01702        1        320:
35%|###5       | 14/40 [00:02<00:04,  5.33it/s]
    483/499    0.206G    0.01903    0.007072    0.01706        1        320:
35%|###5       | 14/40 [00:02<00:04,  5.33it/s]
    483/499    0.206G    0.01903    0.007072    0.01706        1        320:
38%|###7       | 15/40 [00:02<00:04,  5.45it/s]
    483/499    0.206G    0.0184    0.007037    0.01689        2        320:
38%|###7       | 15/40 [00:02<00:04,  5.45it/s]
    483/499    0.206G    0.0184    0.007037    0.01689        2        320:
40%|####       | 16/40 [00:02<00:04,  5.56it/s]
    483/499    0.206G    0.0187    0.007523    0.01708        4        320:
40%|####       | 16/40 [00:03<00:04,  5.56it/s]
    483/499    0.206G    0.0187    0.007523    0.01708        4        320:
42%|####2      | 17/40 [00:03<00:04,  5.35it/s]
    483/499    0.206G    0.01948    0.008124    0.01741        4        320:
42%|####2      | 17/40 [00:03<00:04,  5.35it/s]
    483/499    0.206G    0.01948    0.008124    0.01741        4        320:
45%|####5      | 18/40 [00:03<00:04,  5.48it/s]
    483/499    0.206G    0.01923    0.007971    0.01762        1        320:
45%|####5      | 18/40 [00:03<00:04,  5.48it/s]
    483/499    0.206G    0.01923    0.007971    0.01762        1        320:
```

```
48%|####7         | 19/40 [00:03<00:03,  5.58it/s]
    483/499      0.206G    0.01886    0.007922    0.01746         2         320:
48%|####7         | 19/40 [00:03<00:03,  5.58it/s]
    483/499      0.206G    0.01886    0.007922    0.01746         2         320:
50%|#####         | 20/40 [00:03<00:03,  5.64it/s]
    483/499      0.206G    0.01844    0.007682    0.01719         1         320:
50%|#####         | 20/40 [00:03<00:03,  5.64it/s]
    483/499      0.206G    0.01844    0.007682    0.01719         1         320:
52%|#####2        | 21/40 [00:03<00:03,  5.85it/s]
    483/499      0.206G    0.01854    0.008032    0.01755         4         320:
52%|#####2        | 21/40 [00:03<00:03,  5.85it/s]
    483/499      0.206G    0.01854    0.008032    0.01755         4         320:
55%|#####5        | 22/40 [00:03<00:03,  5.68it/s]
    483/499      0.206G    0.01859    0.007995    0.01747         2         320:
55%|#####5        | 22/40 [00:04<00:03,  5.68it/s]
    483/499      0.206G    0.01859    0.007995    0.01747         2         320:
57%|#####7        | 23/40 [00:04<00:03,  5.55it/s]
    483/499      0.206G    0.01884    0.008001    0.01741         1         320:
57%|#####7        | 23/40 [00:04<00:03,  5.55it/s]
    483/499      0.206G    0.01884    0.008001    0.01741         1         320:
60%|######        | 24/40 [00:04<00:02,  5.63it/s]
    483/499      0.206G    0.01858    0.00791     0.01727         2         320:
60%|######        | 24/40 [00:04<00:02,  5.63it/s]
    483/499      0.206G    0.01858    0.00791     0.01727         2         320:
62%|######2       | 25/40 [00:04<00:02,  5.69it/s]
    483/499      0.206G    0.01869    0.008021    0.0174          4         320:
62%|######2       | 25/40 [00:04<00:02,  5.69it/s]
    483/499      0.206G    0.01869    0.008021    0.0174          4         320:
65%|######5       | 26/40 [00:04<00:02,  5.71it/s]
    483/499      0.206G    0.01993    0.008034    0.01791         4         320:
65%|######5       | 26/40 [00:04<00:02,  5.71it/s]
    483/499      0.206G    0.01993    0.008034    0.01791         4         320:
68%|######7       | 27/40 [00:04<00:02,  5.45it/s]
    483/499      0.206G    0.01969    0.007843    0.01773         1         320:
68%|######7       | 27/40 [00:05<00:02,  5.45it/s]
    483/499      0.206G    0.01969    0.007843    0.01773         1         320:
70%|#######       | 28/40 [00:05<00:02,  5.55it/s]
    483/499      0.206G    0.01965    0.008057    0.01795         4         320:
70%|#######       | 28/40 [00:05<00:02,  5.55it/s]
    483/499      0.206G    0.01965    0.008057    0.01795         4         320:
72%|#######2      | 29/40 [00:05<00:01,  5.61it/s]
    483/499      0.206G    0.01953    0.008116    0.01799         2         320:
72%|#######2      | 29/40 [00:05<00:01,  5.61it/s]
    483/499      0.206G    0.01953    0.008116    0.01799         2         320:
75%|#######5      | 30/40 [00:05<00:01,  5.52it/s]
    483/499      0.206G    0.01934    0.008052    0.01784         1         320:
75%|#######5      | 30/40 [00:05<00:01,  5.52it/s]
    483/499      0.206G    0.01934    0.008052    0.01784         1         320:
```

```
78%|#######7  | 31/40 [00:05<00:01,  5.47it/s]
     483/499       0.206G     0.01909     0.007902       0.0177         1       320:
78%|#######7  | 31/40 [00:05<00:01,  5.47it/s]
     483/499       0.206G     0.01909     0.007902       0.0177         1       320:
80%|########  | 32/40 [00:05<00:01,  5.41it/s]
     483/499       0.206G      0.0188     0.007733      0.01755         1       320:
80%|########  | 32/40 [00:05<00:01,  5.41it/s]
     483/499       0.206G      0.0188     0.007733      0.01755         1       320:
82%|########2 | 33/40 [00:05<00:01,  5.39it/s]
     483/499       0.206G     0.01845     0.007591      0.01739         1       320:
82%|########2 | 33/40 [00:06<00:01,  5.39it/s]
     483/499       0.206G     0.01845     0.007591      0.01739         1       320:
85%|########5 | 34/40 [00:06<00:01,  5.24it/s]
     483/499       0.206G     0.01847      0.00773      0.01756         4       320:
85%|########5 | 34/40 [00:06<00:01,  5.24it/s]
     483/499       0.206G     0.01847      0.00773      0.01756         4       320:
88%|########7 | 35/40 [00:06<00:00,  5.00it/s]
     483/499       0.206G     0.01827     0.007657      0.01743         1       320:
88%|########7 | 35/40 [00:06<00:00,  5.00it/s]
     483/499       0.206G     0.01827     0.007657      0.01743         1       320:
90%|######### | 36/40 [00:06<00:00,  4.87it/s]
     483/499       0.206G     0.01813     0.007524      0.01723         1       320:
90%|######### | 36/40 [00:06<00:00,  4.87it/s]
     483/499       0.206G     0.01813     0.007524      0.01723         1       320:
92%|#########2| 37/40 [00:06<00:00,  4.98it/s]
     483/499       0.206G     0.01808     0.007585       0.0172         2       320:
92%|#########2| 37/40 [00:06<00:00,  4.98it/s]
     483/499       0.206G     0.01808     0.007585       0.0172         2       320:
95%|#########5| 38/40 [00:06<00:00,  5.08it/s]
     483/499       0.206G     0.01851      0.00763      0.01717         1       320:
95%|#########5| 38/40 [00:07<00:00,  5.08it/s]
     483/499       0.206G     0.01851      0.00763      0.01717         1       320:
98%|#########7| 39/40 [00:07<00:00,  5.03it/s]
     483/499       0.206G     0.01835     0.007551      0.01707         1       320:
98%|#########7| 39/40 [00:07<00:00,  5.03it/s]
     483/499       0.206G     0.01835     0.007551      0.01707         1       320:
100%|##########| 40/40 [00:07<00:00,  4.86it/s]
     483/499       0.206G     0.01835     0.007551      0.01707         1       320:
100%|##########| 40/40 [00:07<00:00,  5.41it/s]


             Class      Images  Instances           P           R       mAP50
mAP50-95:    0%|             | 0/20 [00:00<?, ?it/s]
             Class      Images  Instances           P           R       mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:01, 12.74it/s]
             Class      Images  Instances           P           R       mAP50
mAP50-95:   20%|##         | 4/20 [00:00<00:01, 12.80it/s]
             Class      Images  Instances           P           R       mAP50
mAP50-95:   30%|###        | 6/20 [00:00<00:01, 13.38it/s]
```

```
                Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 14.30it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 14.27it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 15.42it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 14.98it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:01<00:00, 14.73it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.68it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.40it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.04it/s]
                  all        40         40       0.98      0.975      0.992
0.789

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    484/499     0.206G    0.02612    0.01519    0.02085          4       320:
0%|           | 0/40 [00:00<?, ?it/s]
    484/499     0.206G    0.02612    0.01519    0.02085          4       320:
2%|2         | 1/40 [00:00<00:06,  5.81it/s]
    484/499     0.206G    0.03566    0.01535     0.0229          1       320:
2%|2         | 1/40 [00:00<00:06,  5.81it/s]
    484/499     0.206G    0.03566    0.01535     0.0229          1       320:
5%|5         | 2/40 [00:00<00:07,  5.24it/s]
    484/499     0.206G    0.02841    0.01364    0.02158          1       320:
5%|5         | 2/40 [00:00<00:07,  5.24it/s]
    484/499     0.206G    0.02841    0.01364    0.02158          1       320:
8%|7         | 3/40 [00:00<00:06,  5.49it/s]
    484/499     0.206G    0.02346     0.0121    0.01909          2       320:
8%|7         | 3/40 [00:00<00:06,  5.49it/s]
    484/499     0.206G    0.02346     0.0121    0.01909          2       320:
10%|#          | 4/40 [00:00<00:06,  5.43it/s]
    484/499     0.206G    0.02248    0.01258    0.01843          4       320:
10%|#          | 4/40 [00:00<00:06,  5.43it/s]
    484/499     0.206G    0.02248    0.01258    0.01843          4       320:
12%|#2        | 5/40 [00:00<00:06,  5.37it/s]
    484/499     0.206G    0.02656    0.01165     0.0231          2       320:
12%|#2        | 5/40 [00:01<00:06,  5.37it/s]
    484/499     0.206G    0.02656    0.01165     0.0231          2       320:
15%|#5        | 6/40 [00:01<00:06,  5.36it/s]
    484/499     0.206G    0.02391    0.01043    0.02158          1       320:
15%|#5        | 6/40 [00:01<00:06,  5.36it/s]
```

```
    484/499     0.206G    0.02391    0.01043    0.02158         1         320:
18%|#7         | 7/40 [00:01<00:05,  5.50it/s]
    484/499     0.206G    0.02311    0.01029    0.02058         2         320:
18%|#7         | 7/40 [00:01<00:05,  5.50it/s]
    484/499     0.206G    0.02311    0.01029    0.02058         2         320:
20%|##         | 8/40 [00:01<00:05,  5.43it/s]
    484/499     0.206G    0.02249    0.01096    0.02025         4         320:
20%|##         | 8/40 [00:01<00:05,  5.43it/s]
    484/499     0.206G    0.02249    0.01096    0.02025         4         320:
22%|##2        | 9/40 [00:01<00:05,  5.54it/s]
    484/499     0.206G    0.02164    0.01064    0.01967         2         320:
22%|##2        | 9/40 [00:01<00:05,  5.54it/s]
    484/499     0.206G    0.02164    0.01064    0.01967         2         320:
25%|##5        | 10/40 [00:01<00:05,  5.62it/s]
    484/499     0.206G    0.02248    0.01107    0.02017         4         320:
25%|##5        | 10/40 [00:02<00:05,  5.62it/s]
    484/499     0.206G    0.02248    0.01107    0.02017         4         320:
28%|##7        | 11/40 [00:02<00:05,  5.53it/s]
    484/499     0.206G    0.02213    0.01056    0.02036         1         320:
28%|##7        | 11/40 [00:02<00:05,  5.53it/s]
    484/499     0.206G    0.02213    0.01056    0.02036         1         320:
30%|###        | 12/40 [00:02<00:04,  5.61it/s]
    484/499     0.206G    0.02204    0.01071    0.02047         4         320:
30%|###        | 12/40 [00:02<00:04,  5.61it/s]
    484/499     0.206G    0.02204    0.01071    0.02047         4         320:
32%|###2       | 13/40 [00:02<00:05,  5.38it/s]
    484/499     0.206G    0.02161    0.01077    0.02014         2         320:
32%|###2       | 13/40 [00:02<00:05,  5.38it/s]
    484/499     0.206G    0.02161    0.01077    0.02014         2         320:
35%|###5       | 14/40 [00:02<00:04,  5.49it/s]
    484/499     0.206G    0.02277    0.01058    0.02059         2         320:
35%|###5       | 14/40 [00:02<00:04,  5.49it/s]
    484/499     0.206G    0.02277    0.01058    0.02059         2         320:
38%|###7       | 15/40 [00:02<00:04,  5.44it/s]
    484/499     0.206G    0.02188    0.01032    0.02048         2         320:
38%|###7       | 15/40 [00:02<00:04,  5.44it/s]
    484/499     0.206G    0.02188    0.01032    0.02048         2         320:
40%|####       | 16/40 [00:02<00:04,  5.41it/s]
    484/499     0.206G     0.022     0.01023    0.02027         2         320:
40%|####       | 16/40 [00:03<00:04,  5.41it/s]
    484/499     0.206G     0.022     0.01023    0.02027         2         320:
42%|####2      | 17/40 [00:03<00:04,  5.37it/s]
    484/499     0.206G    0.02176    0.009818   0.01975         1         320:
42%|####2      | 17/40 [00:03<00:04,  5.37it/s]
    484/499     0.206G    0.02176    0.009818   0.01975         1         320:
45%|####5      | 18/40 [00:03<00:04,  5.45it/s]
    484/499     0.206G    0.02136    0.009571   0.01977         2         320:
45%|####5      | 18/40 [00:03<00:04,  5.45it/s]
```

275

```
    484/499      0.206G      0.02136   0.009571      0.01977          2          320:
48%|####7       | 19/40 [00:03<00:03,  5.60it/s]
    484/499      0.206G       0.0213   0.009972      0.01977          4          320:
48%|####7       | 19/40 [00:03<00:03,  5.60it/s]
    484/499      0.206G       0.0213   0.009972      0.01977          4          320:
50%|#####       | 20/40 [00:03<00:03,  5.37it/s]
    484/499      0.206G      0.02065   0.009612      0.01931          1          320:
50%|#####       | 20/40 [00:03<00:03,  5.37it/s]
    484/499      0.206G      0.02065   0.009612      0.01931          1          320:
52%|#####2      | 21/40 [00:03<00:03,  5.64it/s]
    484/499      0.206G      0.02031   0.009638      0.01925          2          320:
52%|#####2      | 21/40 [00:03<00:03,  5.64it/s]
    484/499      0.206G      0.02031   0.009638      0.01925          2          320:
55%|#####5      | 22/40 [00:03<00:03,  5.67it/s]
    484/499      0.206G      0.01967   0.009355      0.01896          1          320:
55%|#####5      | 22/40 [00:04<00:03,  5.67it/s]
    484/499      0.206G      0.01967   0.009355      0.01896          1          320:
57%|#####7      | 23/40 [00:04<00:03,  5.58it/s]
    484/499      0.206G      0.01964   0.009239       0.0187          1          320:
57%|#####7      | 23/40 [00:04<00:03,  5.58it/s]
    484/499      0.206G      0.01964   0.009239       0.0187          1          320:
60%|######      | 24/40 [00:04<00:02,  5.65it/s]
    484/499      0.206G      0.01947   0.009047      0.01849          1          320:
60%|######      | 24/40 [00:04<00:02,  5.65it/s]
    484/499      0.206G      0.01947   0.009047      0.01849          1          320:
62%|######2     | 25/40 [00:04<00:02,  5.67it/s]
    484/499      0.206G      0.01914   0.008885      0.01831          2          320:
62%|######2     | 25/40 [00:04<00:02,  5.67it/s]
    484/499      0.206G      0.01914   0.008885      0.01831          2          320:
65%|######5     | 26/40 [00:04<00:02,  5.57it/s]
    484/499      0.206G       0.0188   0.008663      0.01814          1          320:
65%|######5     | 26/40 [00:04<00:02,  5.57it/s]
    484/499      0.206G       0.0188   0.008663      0.01814          1          320:
68%|######7     | 27/40 [00:04<00:02,  5.79it/s]
    484/499      0.206G      0.01927   0.008889      0.01831          4          320:
68%|######7     | 27/40 [00:05<00:02,  5.79it/s]
    484/499      0.206G      0.01927   0.008889      0.01831          4          320:
70%|#######     | 28/40 [00:05<00:02,  5.63it/s]
    484/499      0.206G      0.01889   0.008742      0.01816          1          320:
70%|#######     | 28/40 [00:05<00:02,  5.63it/s]
    484/499      0.206G      0.01889   0.008742      0.01816          1          320:
72%|#######2    | 29/40 [00:05<00:01,  5.68it/s]
    484/499      0.206G      0.01849   0.008534      0.01799          1          320:
72%|#######2    | 29/40 [00:05<00:01,  5.68it/s]
    484/499      0.206G      0.01849   0.008534      0.01799          1          320:
75%|#######5    | 30/40 [00:05<00:01,  5.72it/s]
    484/499      0.206G      0.01863   0.008634      0.01812          3          320:
75%|#######5    | 30/40 [00:05<00:01,  5.72it/s]
```

```
    484/499      0.206G     0.01863     0.008634     0.01812          3          320:
78%|#######7  | 31/40 [00:05<00:01,  5.75it/s]
    484/499      0.206G     0.01837     0.008497     0.01806          1          320:
78%|#######7  | 31/40 [00:05<00:01,  5.75it/s]
    484/499      0.206G     0.01837     0.008497     0.01806          1          320:
80%|########  | 32/40 [00:05<00:01,  5.74it/s]
    484/499      0.206G     0.01888     0.008631     0.01805          4          320:
80%|########  | 32/40 [00:05<00:01,  5.74it/s]
    484/499      0.206G     0.01888     0.008631     0.01805          4          320:
82%|########2 | 33/40 [00:05<00:01,  5.61it/s]
    484/499      0.206G     0.01907     0.008689     0.01811          2          320:
82%|########2 | 33/40 [00:06<00:01,  5.61it/s]
    484/499      0.206G     0.01907     0.008689     0.01811          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.67it/s]
    484/499      0.206G     0.01929     0.008656      0.0181          2          320:
85%|########5 | 34/40 [00:06<00:01,  5.67it/s]
    484/499      0.206G     0.01929     0.008656      0.0181          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.55it/s]
    484/499      0.206G     0.01901     0.008581     0.01798          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.55it/s]
    484/499      0.206G     0.01901     0.008581     0.01798          2          320:
90%|######### | 36/40 [00:06<00:00,  5.35it/s]
    484/499      0.206G     0.01975     0.008557     0.01806          3          320:
90%|######### | 36/40 [00:06<00:00,  5.35it/s]
    484/499      0.206G     0.01975     0.008557     0.01806          3          320:
92%|#########2| 37/40 [00:06<00:00,  5.21it/s]
    484/499      0.206G     0.01998     0.008758     0.01814          4          320:
92%|#########2| 37/40 [00:06<00:00,  5.21it/s]
    484/499      0.206G     0.01998     0.008758     0.01814          4          320:
95%|#########5| 38/40 [00:06<00:00,  5.12it/s]
    484/499      0.206G     0.02061     0.008661     0.01816          2          320:
95%|#########5| 38/40 [00:07<00:00,  5.12it/s]
    484/499      0.206G     0.02061     0.008661     0.01816          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.31it/s]
    484/499      0.206G     0.02034      0.0086     0.01813          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.31it/s]
    484/499      0.206G     0.02034      0.0086     0.01813          2          320:
100%|##########| 40/40 [00:07<00:00,  5.43it/s]
    484/499      0.206G     0.02034      0.0086     0.01813          2          320:
100%|##########| 40/40 [00:07<00:00,  5.51it/s]


              Class      Images  Instances            P          R       mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances            P          R       mAP50
mAP50-95:  10%|#          | 2/20 [00:00<00:00, 18.28it/s]
              Class      Images  Instances            P          R       mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 16.87it/s]
              Class      Images  Instances            P          R       mAP50
```

```
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 16.46it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 16.53it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  55%|#####5      | 11/20 [00:00<00:00, 18.12it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  65%|######5     | 13/20 [00:00<00:00, 17.41it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  75%|#######5    | 15/20 [00:00<00:00, 17.67it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 16.83it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.20it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.22it/s]
                all         40         40      0.983      0.992      0.995
0.807


      Epoch    GPU_mem    box_loss    obj_loss    cls_loss   Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
    485/499    0.206G     0.01616    0.006929     0.0229           2        320:
0%|          | 0/40 [00:00<?, ?it/s]
    485/499    0.206G     0.01616    0.006929     0.0229           2        320:
2%|2         | 1/40 [00:00<00:06,  5.79it/s]
    485/499    0.206G     0.03019     0.00937    0.02123           4        320:
2%|2         | 1/40 [00:00<00:06,  5.79it/s]
    485/499    0.206G     0.03019     0.00937    0.02123           4        320:
5%|5         | 2/40 [00:00<00:07,  5.25it/s]
    485/499    0.206G     0.03304    0.008665    0.02156           2        320:
5%|5         | 2/40 [00:00<00:07,  5.25it/s]
    485/499    0.206G     0.03304    0.008665    0.02156           2        320:
8%|7         | 3/40 [00:00<00:07,  5.17it/s]
    485/499    0.206G     0.03671    0.007852    0.01996           2        320:
8%|7         | 3/40 [00:00<00:07,  5.17it/s]
    485/499    0.206G     0.03671    0.007852    0.01996           2        320:
10%|#         | 4/40 [00:00<00:06,  5.16it/s]
    485/499    0.206G     0.03233    0.007591    0.02043           2        320:
10%|#         | 4/40 [00:00<00:06,  5.16it/s]
    485/499    0.206G     0.03233    0.007591    0.02043           2        320:
12%|#2        | 5/40 [00:00<00:06,  5.55it/s]
    485/499    0.206G       0.031    0.008897    0.01997           4        320:
12%|#2        | 5/40 [00:01<00:06,  5.55it/s]
    485/499    0.206G       0.031    0.008897    0.01997           4        320:
15%|#5        | 6/40 [00:01<00:06,  5.28it/s]
    485/499    0.206G     0.02947     0.01015     0.0196           4        320:
15%|#5        | 6/40 [00:01<00:06,  5.28it/s]
    485/499    0.206G     0.02947     0.01015     0.0196           4        320:
```

278

```
18%|#7          | 7/40 [00:01<00:06,  5.30it/s]
    485/499     0.206G     0.02655    0.009267     0.01937          1          320:
18%|#7          | 7/40 [00:01<00:06,  5.30it/s]
    485/499     0.206G     0.02655    0.009267     0.01937          1          320:
20%|##          | 8/40 [00:01<00:06,  5.31it/s]
    485/499     0.206G     0.02645    0.009653     0.02077          4          320:
20%|##          | 8/40 [00:01<00:06,  5.31it/s]
    485/499     0.206G     0.02645    0.009653     0.02077          4          320:
22%|##2         | 9/40 [00:01<00:05,  5.45it/s]
    485/499     0.206G     0.02488    0.009328     0.02095          2          320:
22%|##2         | 9/40 [00:01<00:05,  5.45it/s]
    485/499     0.206G     0.02488    0.009328     0.02095          2          320:
25%|##5         | 10/40 [00:01<00:05,  5.56it/s]
    485/499     0.206G     0.02685    0.009266      0.0209          2          320:
25%|##5         | 10/40 [00:02<00:05,  5.56it/s]
    485/499     0.206G     0.02685    0.009266      0.0209          2          320:
28%|##7         | 11/40 [00:02<00:05,  5.49it/s]
    485/499     0.206G     0.02845    0.00897      0.02209          2          320:
28%|##7         | 11/40 [00:02<00:05,  5.49it/s]
    485/499     0.206G     0.02845    0.00897      0.02209          2          320:
30%|###         | 12/40 [00:02<00:05,  5.56it/s]
    485/499     0.206G     0.02721    0.008504     0.02129          1          320:
30%|###         | 12/40 [00:02<00:05,  5.56it/s]
    485/499     0.206G     0.02721    0.008504     0.02129          1          320:
32%|###2        | 13/40 [00:02<00:04,  5.49it/s]
    485/499     0.206G      0.027     0.008753     0.02088          4          320:
32%|###2        | 13/40 [00:02<00:04,  5.49it/s]
    485/499     0.206G      0.027     0.008753     0.02088          4          320:
35%|###5        | 14/40 [00:02<00:04,  5.59it/s]
    485/499     0.206G      0.026     0.008761     0.02031          2          320:
35%|###5        | 14/40 [00:02<00:04,  5.59it/s]
    485/499     0.206G      0.026     0.008761     0.02031          2          320:
38%|###7        | 15/40 [00:02<00:04,  5.64it/s]
    485/499     0.206G     0.02496    0.00862      0.02003          2          320:
38%|###7        | 15/40 [00:02<00:04,  5.64it/s]
    485/499     0.206G     0.02496    0.00862      0.02003          2          320:
40%|####        | 16/40 [00:02<00:04,  5.69it/s]
    485/499     0.206G     0.0251     0.008786     0.01973          4          320:
40%|####        | 16/40 [00:03<00:04,  5.69it/s]
    485/499     0.206G     0.0251     0.008786     0.01973          4          320:
42%|####2       | 17/40 [00:03<00:04,  5.43it/s]
    485/499     0.206G     0.02442    0.008679      0.0194          2          320:
42%|####2       | 17/40 [00:03<00:04,  5.43it/s]
    485/499     0.206G     0.02442    0.008679      0.0194          2          320:
45%|####5       | 18/40 [00:03<00:03,  5.54it/s]
    485/499     0.206G     0.02367    0.008663     0.01917          4          320:
45%|####5       | 18/40 [00:03<00:03,  5.54it/s]
    485/499     0.206G     0.02367    0.008663     0.01917          4          320:
```

```
48%|####7        | 19/40 [00:03<00:03,  5.48it/s]
    485/499     0.206G    0.02349   0.008791    0.01919        4        320:
48%|####7        | 19/40 [00:03<00:03,  5.48it/s]
    485/499     0.206G    0.02349   0.008791    0.01919        4        320:
50%|#####        | 20/40 [00:03<00:03,  5.30it/s]
    485/499     0.206G    0.02266   0.008494    0.01881        1        320:
50%|#####        | 20/40 [00:03<00:03,  5.30it/s]
    485/499     0.206G    0.02266   0.008494    0.01881        1        320:
52%|#####2       | 21/40 [00:03<00:03,  5.03it/s]
    485/499     0.206G    0.02245   0.008426    0.01868        2        320:
52%|#####2       | 21/40 [00:04<00:03,  5.03it/s]
    485/499     0.206G    0.02245   0.008426    0.01868        2        320:
55%|#####5       | 22/40 [00:04<00:03,  5.12it/s]
    485/499     0.206G    0.02282   0.008669    0.01871        4        320:
55%|#####5       | 22/40 [00:04<00:03,  5.12it/s]
    485/499     0.206G    0.02282   0.008669    0.01871        4        320:
57%|#####7       | 23/40 [00:04<00:03,  5.05it/s]
    485/499     0.206G    0.02383   0.008672    0.01855        2        320:
57%|#####7       | 23/40 [00:04<00:03,  5.05it/s]
    485/499     0.206G    0.02383   0.008672    0.01855        2        320:
60%|######       | 24/40 [00:04<00:03,  4.90it/s]
    485/499     0.206G    0.02427   0.008593     0.0185        2        320:
60%|######       | 24/40 [00:04<00:03,  4.90it/s]
    485/499     0.206G    0.02427   0.008593     0.0185        2        320:
62%|######2      | 25/40 [00:04<00:03,  4.90it/s]
    485/499     0.206G    0.02441   0.008744    0.01843        4        320:
62%|######2      | 25/40 [00:04<00:03,  4.90it/s]
    485/499     0.206G    0.02441   0.008744    0.01843        4        320:
65%|######5      | 26/40 [00:04<00:02,  4.89it/s]
    485/499     0.206G     0.025    0.008761    0.01837        2        320:
65%|######5      | 26/40 [00:05<00:02,  4.89it/s]
    485/499     0.206G     0.025    0.008761    0.01837        2        320:
68%|######7      | 27/40 [00:05<00:02,  4.69it/s]
    485/499     0.206G    0.02486    0.00901    0.01848        4        320:
68%|######7      | 27/40 [00:05<00:02,  4.69it/s]
    485/499     0.206G    0.02486    0.00901    0.01848        4        320:
70%|#######      | 28/40 [00:05<00:02,  4.75it/s]
    485/499     0.206G    0.02425   0.008832     0.0182        1        320:
70%|#######      | 28/40 [00:05<00:02,  4.75it/s]
    485/499     0.206G    0.02425   0.008832     0.0182        1        320:
72%|#######2     | 29/40 [00:05<00:02,  4.79it/s]
    485/499     0.206G    0.02363   0.008607    0.01819        1        320:
72%|#######2     | 29/40 [00:05<00:02,  4.79it/s]
    485/499     0.206G    0.02363   0.008607    0.01819        1        320:
75%|#######5     | 30/40 [00:05<00:02,  4.83it/s]
    485/499     0.206G    0.02359   0.008763    0.01817        4        320:
75%|#######5     | 30/40 [00:05<00:02,  4.83it/s]
    485/499     0.206G    0.02359   0.008763    0.01817        4        320:
```

```
78%|#######7   | 31/40 [00:05<00:01,  4.97it/s]
    485/499      0.206G     0.02336   0.008606    0.01803          1         320:
78%|#######7   | 31/40 [00:06<00:01,  4.97it/s]
    485/499      0.206G     0.02336   0.008606    0.01803          1         320:
80%|########   | 32/40 [00:06<00:01,  4.95it/s]
    485/499      0.206G     0.02349   0.008677    0.01837          4         320:
80%|########   | 32/40 [00:06<00:01,  4.95it/s]
    485/499      0.206G     0.02349   0.008677    0.01837          4         320:
82%|########2  | 33/40 [00:06<00:01,  4.93it/s]
    485/499      0.206G     0.02339   0.008842    0.01839          4         320:
82%|########2  | 33/40 [00:06<00:01,  4.93it/s]
    485/499      0.206G     0.02339   0.008842    0.01839          4         320:
85%|########5  | 34/40 [00:06<00:01,  4.91it/s]
    485/499      0.206G     0.02331   0.008971    0.01837          4         320:
85%|########5  | 34/40 [00:06<00:01,  4.91it/s]
    485/499      0.206G     0.02331   0.008971    0.01837          4         320:
88%|########7  | 35/40 [00:06<00:00,  5.03it/s]
    485/499      0.206G     0.02286   0.008834    0.01843          2         320:
88%|########7  | 35/40 [00:06<00:00,  5.03it/s]
    485/499      0.206G     0.02286   0.008834    0.01843          2         320:
90%|######### | 36/40 [00:06<00:00,  5.11it/s]
    485/499      0.206G     0.02268   0.008933    0.01845          4         320:
90%|######### | 36/40 [00:07<00:00,  5.11it/s]
    485/499      0.206G     0.02268   0.008933    0.01845          4         320:
92%|#########2| 37/40 [00:07<00:00,  5.18it/s]
    485/499      0.206G     0.02249    0.00887    0.01833          2         320:
92%|#########2| 37/40 [00:07<00:00,  5.18it/s]
    485/499      0.206G     0.02249    0.00887    0.01833          2         320:
95%|#########5| 38/40 [00:07<00:00,  5.10it/s]
    485/499      0.206G     0.02248   0.008868    0.01831          2         320:
95%|#########5| 38/40 [00:07<00:00,  5.10it/s]
    485/499      0.206G     0.02248   0.008868    0.01831          2         320:
98%|#########7| 39/40 [00:07<00:00,  5.28it/s]
    485/499      0.206G     0.02245   0.009009     0.0184          4         320:
98%|#########7| 39/40 [00:07<00:00,  5.28it/s]
    485/499      0.206G     0.02245   0.009009     0.0184          4         320:
100%|##########| 40/40 [00:07<00:00,  5.29it/s]
    485/499      0.206G     0.02245   0.009009     0.0184          4         320:
100%|##########| 40/40 [00:07<00:00,  5.20it/s]


             Class      Images  Instances          P         R      mAP50
mAP50-95:    0%|            | 0/20 [00:00<?, ?it/s]
             Class      Images  Instances          P         R      mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:00, 18.29it/s]
             Class      Images  Instances          P         R      mAP50
mAP50-95:   20%|##         | 4/20 [00:00<00:00, 16.85it/s]
             Class      Images  Instances          P         R      mAP50
mAP50-95:   30%|###        | 6/20 [00:00<00:00, 17.27it/s]
```

```
              Class     Images  Instances         P         R     mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 17.65it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 17.87it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 16.43it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 15.66it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  80%|########    | 16/20 [00:00<00:00, 16.41it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.66it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.76it/s]
              Class     Images  Instances         P         R     mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.37it/s]
                all        40        40     0.983     0.992     0.995
0.807

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances      Size

  0%|          | 0/40 [00:00<?, ?it/s]
    486/499     0.206G   0.007277   0.002907    0.01443          1       320:
0%|          | 0/40 [00:00<?, ?it/s]
    486/499     0.206G   0.007277   0.002907    0.01443          1       320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
    486/499     0.206G   0.007909   0.004293    0.01307          2       320:
2%|2         | 1/40 [00:00<00:06,  5.82it/s]
    486/499     0.206G   0.007909   0.004293    0.01307          2       320:
5%|5         | 2/40 [00:00<00:06,  6.12it/s]
    486/499     0.206G   0.008579   0.004707    0.01289          2       320:
5%|5         | 2/40 [00:00<00:06,  6.12it/s]
    486/499     0.206G   0.008579   0.004707    0.01289          2       320:
8%|7         | 3/40 [00:00<00:06,  5.73it/s]
    486/499     0.206G    0.01179   0.007297    0.01603          3       320:
8%|7         | 3/40 [00:00<00:06,  5.73it/s]
    486/499     0.206G    0.01179   0.007297    0.01603          3       320:
10%|#         | 4/40 [00:00<00:06,  5.77it/s]
    486/499     0.206G    0.01125    0.00708    0.01635          1       320:
10%|#         | 4/40 [00:00<00:06,  5.77it/s]
    486/499     0.206G    0.01125    0.00708    0.01635          1       320:
12%|#2        | 5/40 [00:00<00:05,  5.95it/s]
    486/499     0.206G    0.01719   0.006918    0.01646          2       320:
12%|#2        | 5/40 [00:01<00:05,  5.95it/s]
    486/499     0.206G    0.01719   0.006918    0.01646          2       320:
15%|#5        | 6/40 [00:01<00:06,  5.39it/s]
    486/499     0.206G     0.0168   0.007877    0.01786          4       320:
15%|#5        | 6/40 [00:01<00:06,  5.39it/s]
```

282

```
    486/499      0.206G      0.0168    0.007877      0.01786           4          320:
18%|#7          | 7/40 [00:01<00:06,  5.21it/s]
    486/499      0.206G     0.01628    0.007689      0.01731           1          320:
18%|#7          | 7/40 [00:01<00:06,  5.21it/s]
    486/499      0.206G     0.01628    0.007689      0.01731           1          320:
20%|##          | 8/40 [00:01<00:06,  5.25it/s]
    486/499      0.206G     0.01605    0.007248      0.01784           1          320:
20%|##          | 8/40 [00:01<00:06,  5.25it/s]
    486/499      0.206G     0.01605    0.007248      0.01784           1          320:
22%|##2         | 9/40 [00:01<00:05,  5.42it/s]
    486/499      0.206G      0.0194    0.007292      0.01761           2          320:
22%|##2         | 9/40 [00:01<00:05,  5.42it/s]
    486/499      0.206G      0.0194    0.007292      0.01761           2          320:
25%|##5         | 10/40 [00:01<00:05,  5.41it/s]
    486/499      0.206G     0.01875    0.006931      0.01711           1          320:
25%|##5         | 10/40 [00:01<00:05,  5.41it/s]
    486/499      0.206G     0.01875    0.006931      0.01711           1          320:
28%|##7         | 11/40 [00:01<00:05,  5.50it/s]
    486/499      0.206G     0.01924    0.007499      0.01743           4          320:
28%|##7         | 11/40 [00:02<00:05,  5.50it/s]
    486/499      0.206G     0.01924    0.007499      0.01743           4          320:
30%|###         | 12/40 [00:02<00:05,  5.60it/s]
    486/499      0.206G     0.02107    0.007489      0.01737           2          320:
30%|###         | 12/40 [00:02<00:05,  5.60it/s]
    486/499      0.206G     0.02107    0.007489      0.01737           2          320:
32%|###2        | 13/40 [00:02<00:04,  5.47it/s]
    486/499      0.206G     0.02274    0.007384      0.01709           2          320:
32%|###2        | 13/40 [00:02<00:04,  5.47it/s]
    486/499      0.206G     0.02274    0.007384      0.01709           2          320:
35%|###5        | 14/40 [00:02<00:04,  5.44it/s]
    486/499      0.206G     0.02225    0.007337      0.01674           2          320:
35%|###5        | 14/40 [00:02<00:04,  5.44it/s]
    486/499      0.206G     0.02225    0.007337      0.01674           2          320:
38%|###7        | 15/40 [00:02<00:04,  5.41it/s]
    486/499      0.206G     0.02133    0.007057      0.01667           1          320:
38%|###7        | 15/40 [00:02<00:04,  5.41it/s]
    486/499      0.206G     0.02133    0.007057      0.01667           1          320:
40%|####        | 16/40 [00:02<00:04,  5.51it/s]
    486/499      0.206G     0.02163    0.007488      0.01817           4          320:
40%|####        | 16/40 [00:03<00:04,  5.51it/s]
    486/499      0.206G     0.02163    0.007488      0.01817           4          320:
42%|####2       | 17/40 [00:03<00:04,  5.46it/s]
    486/499      0.206G     0.02081    0.007216      0.01776           1          320:
42%|####2       | 17/40 [00:03<00:04,  5.46it/s]
    486/499      0.206G     0.02081    0.007216      0.01776           1          320:
45%|####5       | 18/40 [00:03<00:03,  5.56it/s]
    486/499      0.206G     0.02043    0.007398      0.01795           4          320:
45%|####5       | 18/40 [00:03<00:03,  5.56it/s]
```

283

```
    486/499      0.206G     0.02043    0.007398      0.01795         4         320:
48%|####7      | 19/40 [00:03<00:03,  5.34it/s]
    486/499      0.206G     0.01983    0.007571      0.01776         4         320:
48%|####7      | 19/40 [00:03<00:03,  5.34it/s]
    486/499      0.206G     0.01983    0.007571      0.01776         4         320:
50%|#####      | 20/40 [00:03<00:03,  5.20it/s]
    486/499      0.206G     0.01954    0.007641      0.01767         1         320:
50%|#####      | 20/40 [00:03<00:03,  5.20it/s]
    486/499      0.206G     0.01954    0.007641      0.01767         1         320:
52%|#####2     | 21/40 [00:03<00:03,  5.37it/s]
    486/499      0.206G     0.01991    0.007643      0.01762         3         320:
52%|#####2     | 21/40 [00:04<00:03,  5.37it/s]
    486/499      0.206G     0.01991    0.007643      0.01762         3         320:
55%|#####5     | 22/40 [00:04<00:03,  5.35it/s]
    486/499      0.206G      0.0196    0.007458      0.01744         1         320:
55%|#####5     | 22/40 [00:04<00:03,  5.35it/s]
    486/499      0.206G      0.0196    0.007458      0.01744         1         320:
57%|#####7     | 23/40 [00:04<00:03,  5.48it/s]
    486/499      0.206G     0.02081    0.007439      0.01749         2         320:
57%|#####7     | 23/40 [00:04<00:03,  5.48it/s]
    486/499      0.206G     0.02081    0.007439      0.01749         2         320:
60%|######     | 24/40 [00:04<00:02,  5.58it/s]
    486/499      0.206G     0.02049    0.007289      0.01761         1         320:
60%|######     | 24/40 [00:04<00:02,  5.58it/s]
    486/499      0.206G     0.02049    0.007289      0.01761         1         320:
62%|######2    | 25/40 [00:04<00:02,  5.50it/s]
    486/499      0.206G     0.02054    0.007331      0.01755         2         320:
62%|######2    | 25/40 [00:04<00:02,  5.50it/s]
    486/499      0.206G     0.02054    0.007331      0.01755         2         320:
65%|######5    | 26/40 [00:04<00:02,  5.59it/s]
    486/499      0.206G     0.02032    0.007271       0.0175         2         320:
65%|######5    | 26/40 [00:04<00:02,  5.59it/s]
    486/499      0.206G     0.02032    0.007271       0.0175         2         320:
68%|######7    | 27/40 [00:04<00:02,  5.66it/s]
    486/499      0.206G      0.0196    0.007069      0.01687         0         320:
68%|######7    | 27/40 [00:05<00:02,  5.66it/s]
    486/499      0.206G      0.0196    0.007069      0.01687         0         320:
70%|#######    | 28/40 [00:05<00:02,  5.83it/s]
    486/499      0.206G     0.01938    0.007145      0.01673         2         320:
70%|#######    | 28/40 [00:05<00:02,  5.83it/s]
    486/499      0.206G     0.01938    0.007145      0.01673         2         320:
72%|#######2   | 29/40 [00:05<00:01,  5.83it/s]
    486/499      0.206G     0.01928    0.007207      0.01669         3         320:
72%|#######2   | 29/40 [00:05<00:01,  5.83it/s]
    486/499      0.206G     0.01928    0.007207      0.01669         3         320:
75%|#######5   | 30/40 [00:05<00:01,  5.82it/s]
    486/499      0.206G     0.01903    0.007098      0.01653         1         320:
75%|#######5   | 30/40 [00:05<00:01,  5.82it/s]
```

```
    486/499      0.206G     0.01903    0.007098      0.01653          1          320:
78%|#######7  | 31/40 [00:05<00:01,  5.64it/s]
    486/499      0.206G     0.01862    0.007025      0.01652          1          320:
78%|#######7  | 31/40 [00:05<00:01,  5.64it/s]
    486/499      0.206G     0.01862    0.007025      0.01652          1          320:
80%|########  | 32/40 [00:05<00:01,  5.69it/s]
    486/499      0.206G     0.01865    0.006917      0.01664          1          320:
80%|########  | 32/40 [00:05<00:01,  5.69it/s]
    486/499      0.206G     0.01865    0.006917      0.01664          1          320:
82%|########2 | 33/40 [00:05<00:01,  5.73it/s]
    486/499      0.206G     0.01846     0.00685      0.01652          1          320:
82%|########2 | 33/40 [00:06<00:01,  5.73it/s]
    486/499      0.206G     0.01846     0.00685      0.01652          1          320:
85%|########5 | 34/40 [00:06<00:01,  5.74it/s]
    486/499      0.206G     0.01899    0.006953      0.01655          3          320:
85%|########5 | 34/40 [00:06<00:01,  5.74it/s]
    486/499      0.206G     0.01899    0.006953      0.01655          3          320:
88%|########7 | 35/40 [00:06<00:00,  5.61it/s]
    486/499      0.206G      0.0186    0.006853      0.01651          1          320:
88%|########7 | 35/40 [00:06<00:00,  5.61it/s]
    486/499      0.206G      0.0186    0.006853      0.01651          1          320:
90%|######### | 36/40 [00:06<00:00,  5.67it/s]
    486/499      0.206G     0.01852    0.006946      0.01702          4          320:
90%|######### | 36/40 [00:06<00:00,  5.67it/s]
    486/499      0.206G     0.01852    0.006946      0.01702          4          320:
92%|#########2| 37/40 [00:06<00:00,  5.70it/s]
    486/499      0.206G     0.01825    0.006857      0.01684          1          320:
92%|#########2| 37/40 [00:06<00:00,  5.70it/s]
    486/499      0.206G     0.01825    0.006857      0.01684          1          320:
95%|#########5| 38/40 [00:06<00:00,  5.58it/s]
    486/499      0.206G     0.01828    0.006872      0.01675          2          320:
95%|#########5| 38/40 [00:07<00:00,  5.58it/s]
    486/499      0.206G     0.01828    0.006872      0.01675          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.65it/s]
    486/499      0.206G     0.01832    0.006842      0.01696          2          320:
98%|#########7| 39/40 [00:07<00:00,  5.65it/s]
    486/499      0.206G     0.01832    0.006842      0.01696          2          320:
100%|##########| 40/40 [00:07<00:00,  5.55it/s]
    486/499      0.206G     0.01832    0.006842      0.01696          2          320:
100%|##########| 40/40 [00:07<00:00,  5.56it/s]


              Class      Images  Instances           P          R       mAP50
mAP50-95:   0%|             | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances           P          R       mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:01, 15.99it/s]
              Class      Images  Instances           P          R       mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:00, 17.27it/s]
              Class      Images  Instances           P          R       mAP50
```

```
mAP50-95:  35%|###5        | 7/20 [00:00<00:00, 18.29it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  45%|####5       | 9/20 [00:00<00:00, 18.08it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  55%|#####5      | 11/20 [00:00<00:00, 16.59it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  65%|######5     | 13/20 [00:00<00:00, 17.09it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:00<00:00, 17.89it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.25it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.56it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.46it/s]
                all         40         40      0.986      0.992      0.995
0.813
```

```
        Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

   0%|            | 0/40 [00:00<?, ?it/s]
      487/499    0.206G    0.02313   0.007112    0.01339          2       320:
0%|            | 0/40 [00:00<?, ?it/s]
      487/499    0.206G    0.02313   0.007112    0.01339          2       320:
2%|2          | 1/40 [00:00<00:06,  5.73it/s]
      487/499    0.206G    0.02067   0.007111    0.01772          2       320:
2%|2          | 1/40 [00:00<00:06,  5.73it/s]
      487/499    0.206G    0.02067   0.007111    0.01772          2       320:
5%|5          | 2/40 [00:00<00:06,  6.11it/s]
      487/499    0.206G    0.01625   0.005765    0.01982          1       320:
5%|5          | 2/40 [00:00<00:06,  6.11it/s]
      487/499    0.206G    0.01625   0.005765    0.01982          1       320:
8%|7          | 3/40 [00:00<00:06,  5.97it/s]
      487/499    0.206G    0.01609   0.006604    0.01931          2       320:
8%|7          | 3/40 [00:00<00:06,  5.97it/s]
      487/499    0.206G    0.01609   0.006604    0.01931          2       320:
10%|#          | 4/40 [00:00<00:06,  5.89it/s]
      487/499    0.206G     0.0219   0.006907    0.01883          2       320:
10%|#          | 4/40 [00:00<00:06,  5.89it/s]
      487/499    0.206G     0.0219   0.006907    0.01883          2       320:
12%|#2         | 5/40 [00:00<00:06,  5.50it/s]
      487/499    0.206G    0.02228   0.006727    0.02096          2       320:
12%|#2         | 5/40 [00:01<00:06,  5.50it/s]
      487/499    0.206G    0.02228   0.006727    0.02096          2       320:
15%|#5         | 6/40 [00:01<00:06,  5.44it/s]
      487/499    0.206G    0.02549   0.006877    0.02008          2       320:
15%|#5         | 6/40 [00:01<00:06,  5.44it/s]
      487/499    0.206G    0.02549   0.006877    0.02008          2       320:
```

```
18%|#7          | 7/40 [00:01<00:05,  5.56it/s]
    487/499    0.206G    0.02343   0.006463   0.01904        1       320:
18%|#7          | 7/40 [00:01<00:05,  5.56it/s]
    487/499    0.206G    0.02343   0.006463   0.01904        1       320:
20%|##          | 8/40 [00:01<00:05,  5.49it/s]
    487/499    0.206G    0.02194   0.006263   0.01802        1       320:
20%|##          | 8/40 [00:01<00:05,  5.49it/s]
    487/499    0.206G    0.02194   0.006263   0.01802        1       320:
22%|##2         | 9/40 [00:01<00:05,  5.25it/s]
    487/499    0.206G    0.02309   0.006516   0.01762        2       320:
22%|##2         | 9/40 [00:01<00:05,  5.25it/s]
    487/499    0.206G    0.02309   0.006516   0.01762        2       320:
25%|##5         | 10/40 [00:01<00:05,  5.17it/s]
    487/499    0.206G    0.02157   0.006497   0.01729        2       320:
25%|##5         | 10/40 [00:02<00:05,  5.17it/s]
    487/499    0.206G    0.02157   0.006497   0.01729        2       320:
28%|##7         | 11/40 [00:02<00:05,  5.22it/s]
    487/499    0.206G    0.02266   0.007751   0.01764        4       320:
28%|##7         | 11/40 [00:02<00:05,  5.22it/s]
    487/499    0.206G    0.02266   0.007751   0.01764        4       320:
30%|###         | 12/40 [00:02<00:05,  4.97it/s]
    487/499    0.206G    0.02183   0.007406   0.01732        1       320:
30%|###         | 12/40 [00:02<00:05,  4.97it/s]
    487/499    0.206G    0.02183   0.007406   0.01732        1       320:
32%|###2        | 13/40 [00:02<00:05,  5.08it/s]
    487/499    0.206G    0.02076   0.007086   0.01736        1       320:
32%|###2        | 13/40 [00:02<00:05,  5.08it/s]
    487/499    0.206G    0.02076   0.007086   0.01736        1       320:
35%|###5        | 14/40 [00:02<00:05,  5.15it/s]
    487/499    0.206G    0.01999   0.007241   0.01784        2       320:
35%|###5        | 14/40 [00:02<00:05,  5.15it/s]
    487/499    0.206G    0.01999   0.007241   0.01784        2       320:
38%|###7        | 15/40 [00:02<00:04,  5.07it/s]
    487/499    0.206G    0.0201    0.007751   0.01847        4       320:
38%|###7        | 15/40 [00:03<00:04,  5.07it/s]
    487/499    0.206G    0.0201    0.007751   0.01847        4       320:
40%|####        | 16/40 [00:03<00:04,  5.03it/s]
    487/499    0.206G    0.01993   0.007781   0.01811        2       320:
40%|####        | 16/40 [00:03<00:04,  5.03it/s]
    487/499    0.206G    0.01993   0.007781   0.01811        2       320:
42%|####2       | 17/40 [00:03<00:04,  5.10it/s]
    487/499    0.206G    0.01938   0.007569   0.01782        1       320:
42%|####2       | 17/40 [00:03<00:04,  5.10it/s]
    487/499    0.206G    0.01938   0.007569   0.01782        1       320:
45%|####5       | 18/40 [00:03<00:04,  5.17it/s]
    487/499    0.206G    0.01836   0.007452   0.01689        0       320:
45%|####5       | 18/40 [00:03<00:04,  5.17it/s]
    487/499    0.206G    0.01836   0.007452   0.01689        0       320:
```

```
48%|####7        | 19/40 [00:03<00:03,  5.34it/s]
    487/499     0.206G     0.01796    0.007595    0.01688        2        320:
48%|####7        | 19/40 [00:03<00:03,  5.34it/s]
    487/499     0.206G     0.01796    0.007595    0.01688        2        320:
50%|#####        | 20/40 [00:03<00:03,  5.30it/s]
    487/499     0.206G      0.0177    0.007483    0.01662        1        320:
50%|#####        | 20/40 [00:03<00:03,  5.30it/s]
    487/499     0.206G      0.0177    0.007483    0.01662        1        320:
52%|#####2       | 21/40 [00:03<00:03,  5.22it/s]
    487/499     0.206G     0.01835     0.00779    0.01717        4        320:
52%|#####2       | 21/40 [00:04<00:03,  5.22it/s]
    487/499     0.206G     0.01835     0.00779    0.01717        4        320:
55%|#####5       | 22/40 [00:04<00:03,  5.13it/s]
    487/499     0.206G      0.0183    0.008133    0.01774        4        320:
55%|#####5       | 22/40 [00:04<00:03,  5.13it/s]
    487/499     0.206G      0.0183    0.008133    0.01774        4        320:
57%|#####7       | 23/40 [00:04<00:03,  5.04it/s]
    487/499     0.206G     0.01795    0.008103    0.01764        2        320:
57%|#####7       | 23/40 [00:04<00:03,  5.04it/s]
    487/499     0.206G     0.01795    0.008103    0.01764        2        320:
60%|######       | 24/40 [00:04<00:03,  5.01it/s]
    487/499     0.206G     0.01763    0.007984    0.01761        1        320:
60%|######       | 24/40 [00:04<00:03,  5.01it/s]
    487/499     0.206G     0.01763    0.007984    0.01761        1        320:
62%|######2      | 25/40 [00:04<00:02,  5.23it/s]
    487/499     0.206G     0.01737    0.007848    0.01757        2        320:
62%|######2      | 25/40 [00:04<00:02,  5.23it/s]
    487/499     0.206G     0.01737    0.007848    0.01757        2        320:
65%|######5      | 26/40 [00:04<00:02,  5.38it/s]
    487/499     0.206G     0.01712    0.007863    0.01761        2        320:
65%|######5      | 26/40 [00:05<00:02,  5.38it/s]
    487/499     0.206G     0.01712    0.007863    0.01761        2        320:
68%|######7      | 27/40 [00:05<00:02,  5.50it/s]
    487/499     0.206G     0.01727    0.008062    0.01807        4        320:
68%|######7      | 27/40 [00:05<00:02,  5.50it/s]
    487/499     0.206G     0.01727    0.008062    0.01807        4        320:
70%|#######      | 28/40 [00:05<00:02,  5.27it/s]
    487/499     0.206G     0.01716    0.008012    0.01791        1        320:
70%|#######      | 28/40 [00:05<00:02,  5.27it/s]
    487/499     0.206G     0.01716    0.008012    0.01791        1        320:
72%|#######2     | 29/40 [00:05<00:02,  5.45it/s]
    487/499     0.206G     0.01696    0.008115    0.01779        2        320:
72%|#######2     | 29/40 [00:05<00:02,  5.45it/s]
    487/499     0.206G     0.01696    0.008115    0.01779        2        320:
75%|#######5     | 30/40 [00:05<00:01,  5.55it/s]
    487/499     0.206G     0.01743    0.008227    0.01796        3        320:
75%|#######5     | 30/40 [00:05<00:01,  5.55it/s]
    487/499     0.206G     0.01743    0.008227    0.01796        3        320:
```

```
78%|#######7   | 31/40 [00:05<00:01,  5.20it/s]
     487/499      0.206G    0.01743   0.008152     0.01781        1        320:
78%|#######7   | 31/40 [00:06<00:01,  5.20it/s]
     487/499      0.206G    0.01743   0.008152     0.01781        1        320:
80%|########   | 32/40 [00:06<00:01,  5.51it/s]
     487/499      0.206G    0.01836   0.008095     0.01774        2        320:
80%|########   | 32/40 [00:06<00:01,  5.51it/s]
     487/499      0.206G    0.01836   0.008095     0.01774        2        320:
82%|########2  | 33/40 [00:06<00:01,  5.45it/s]
     487/499      0.206G    0.01838   0.008221      0.0177        4        320:
82%|########2  | 33/40 [00:06<00:01,  5.45it/s]
     487/499      0.206G    0.01838   0.008221      0.0177        4        320:
85%|########5  | 34/40 [00:06<00:01,  5.39it/s]
     487/499      0.206G    0.01881   0.008404     0.01784        4        320:
85%|########5  | 34/40 [00:06<00:01,  5.39it/s]
     487/499      0.206G    0.01881   0.008404     0.01784        4        320:
88%|########7  | 35/40 [00:06<00:00,  5.41it/s]
     487/499      0.206G    0.01931   0.008604     0.01799        4        320:
88%|########7  | 35/40 [00:06<00:00,  5.41it/s]
     487/499      0.206G    0.01931   0.008604     0.01799        4        320:
90%|######### | 36/40 [00:06<00:00,  5.52it/s]
     487/499      0.206G    0.01932   0.008474     0.01798        1        320:
90%|######### | 36/40 [00:06<00:00,  5.52it/s]
     487/499      0.206G    0.01932   0.008474     0.01798        1        320:
92%|#########2| 37/40 [00:06<00:00,  5.50it/s]
     487/499      0.206G    0.01996   0.008495     0.01794        3        320:
92%|#########2| 37/40 [00:07<00:00,  5.50it/s]
     487/499      0.206G    0.01996   0.008495     0.01794        3        320:
95%|#########5| 38/40 [00:07<00:00,  5.53it/s]
     487/499      0.206G    0.02024   0.008657     0.01806        4        320:
95%|#########5| 38/40 [00:07<00:00,  5.53it/s]
     487/499      0.206G    0.02024   0.008657     0.01806        4        320:
98%|#########7| 39/40 [00:07<00:00,  5.33it/s]
     487/499      0.206G    0.02047   0.008742     0.01815        4        320:
98%|#########7| 39/40 [00:07<00:00,  5.33it/s]
     487/499      0.206G    0.02047   0.008742     0.01815        4        320:
100%|##########| 40/40 [00:07<00:00,  5.18it/s]
     487/499      0.206G    0.02047   0.008742     0.01815        4        320:
100%|##########| 40/40 [00:07<00:00,  5.31it/s]


            Class      Images  Instances            P         R      mAP50
mAP50-95:    0%|             | 0/20 [00:00<?, ?it/s]
            Class      Images  Instances            P         R      mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:01, 14.21it/s]
            Class      Images  Instances            P         R      mAP50
mAP50-95:   20%|##         | 4/20 [00:00<00:00, 16.31it/s]
            Class      Images  Instances            P         R      mAP50
mAP50-95:   30%|###        | 6/20 [00:00<00:00, 14.50it/s]
```

```
              Class      Images  Instances          P          R      mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 15.72it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 16.56it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 16.36it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 16.93it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  80%|########    | 16/20 [00:01<00:00, 15.61it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.37it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.17it/s]
              Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.94it/s]
                all        40         40       0.986      0.992      0.995
0.813

      Epoch    GPU_mem    box_loss    obj_loss    cls_loss   Instances       Size

  0%|            | 0/40 [00:00<?, ?it/s]
    488/499     0.206G     0.06756    0.008855     0.01823          3        320:
0%|            | 0/40 [00:00<?, ?it/s]
    488/499     0.206G     0.06756    0.008855     0.01823          3        320:
2%|2          | 1/40 [00:00<00:07,  5.33it/s]
    488/499     0.206G     0.03876     0.00739     0.01539          2        320:
2%|2          | 1/40 [00:00<00:07,  5.33it/s]
    488/499     0.206G     0.03876     0.00739     0.01539          2        320:
5%|5          | 2/40 [00:00<00:07,  5.33it/s]
    488/499     0.206G     0.02924    0.006583     0.01488          1        320:
5%|5          | 2/40 [00:00<00:07,  5.33it/s]
    488/499     0.206G     0.02924    0.006583     0.01488          1        320:
8%|7          | 3/40 [00:00<00:06,  5.74it/s]
    488/499     0.206G     0.02604    0.007796     0.01733          4        320:
8%|7          | 3/40 [00:00<00:06,  5.74it/s]
    488/499     0.206G     0.02604    0.007796     0.01733          4        320:
10%|#          | 4/40 [00:00<00:07,  5.05it/s]
    488/499     0.206G       0.026    0.008683     0.01746          4        320:
10%|#          | 4/40 [00:00<00:07,  5.05it/s]
    488/499     0.206G       0.026    0.008683     0.01746          4        320:
12%|#2         | 5/40 [00:00<00:06,  5.15it/s]
    488/499     0.206G     0.02288    0.007644      0.0168          1        320:
12%|#2         | 5/40 [00:01<00:06,  5.15it/s]
    488/499     0.206G     0.02288    0.007644      0.0168          1        320:
15%|#5         | 6/40 [00:01<00:06,  5.34it/s]
    488/499     0.206G     0.02068    0.007113     0.01633          1        320:
15%|#5         | 6/40 [00:01<00:06,  5.34it/s]
```

```
     488/499      0.206G     0.02068    0.007113     0.01633          1          320:
18%|#7           | 7/40 [00:01<00:06,  5.49it/s]
     488/499      0.206G     0.02123    0.007533     0.01703          4          320:
18%|#7           | 7/40 [00:01<00:06,  5.49it/s]
     488/499      0.206G     0.02123    0.007533     0.01703          4          320:
20%|##           | 8/40 [00:01<00:05,  5.59it/s]
     488/499      0.206G      0.0198    0.007012     0.01716          1          320:
20%|##           | 8/40 [00:01<00:05,  5.59it/s]
     488/499      0.206G      0.0198    0.007012     0.01716          1          320:
22%|##2          | 9/40 [00:01<00:05,  5.64it/s]
     488/499      0.206G     0.01846    0.006857     0.01671          2          320:
22%|##2          | 9/40 [00:01<00:05,  5.64it/s]
     488/499      0.206G     0.01846    0.006857     0.01671          2          320:
25%|##5          | 10/40 [00:01<00:05,  5.54it/s]
     488/499      0.206G     0.01895     0.00806     0.01705          4          320:
25%|##5          | 10/40 [00:02<00:05,  5.54it/s]
     488/499      0.206G     0.01895     0.00806     0.01705          4          320:
28%|##7          | 11/40 [00:02<00:05,  5.48it/s]
     488/499      0.206G     0.01827    0.007648     0.01672          1          320:
28%|##7          | 11/40 [00:02<00:05,  5.48it/s]
     488/499      0.206G     0.01827    0.007648     0.01672          1          320:
30%|###          | 12/40 [00:02<00:05,  5.55it/s]
     488/499      0.206G     0.01839    0.007582     0.01686          1          320:
30%|###          | 12/40 [00:02<00:05,  5.55it/s]
     488/499      0.206G     0.01839    0.007582     0.01686          1          320:
32%|###2         | 13/40 [00:02<00:04,  5.62it/s]
     488/499      0.206G     0.01831    0.007942     0.01703          4          320:
32%|###2         | 13/40 [00:02<00:04,  5.62it/s]
     488/499      0.206G     0.01831    0.007942     0.01703          4          320:
35%|###5         | 14/40 [00:02<00:04,  5.37it/s]
     488/499      0.206G     0.01767    0.007807     0.01694          1          320:
35%|###5         | 14/40 [00:02<00:04,  5.37it/s]
     488/499      0.206G     0.01767    0.007807     0.01694          1          320:
38%|###7         | 15/40 [00:02<00:04,  5.52it/s]
     488/499      0.206G     0.01733    0.007641     0.01684          1          320:
38%|###7         | 15/40 [00:02<00:04,  5.52it/s]
     488/499      0.206G     0.01733    0.007641     0.01684          1          320:
40%|####         | 16/40 [00:02<00:04,  5.47it/s]
     488/499      0.206G     0.01685     0.00752      0.0167          2          320:
40%|####         | 16/40 [00:03<00:04,  5.47it/s]
     488/499      0.206G     0.01685     0.00752      0.0167          2          320:
42%|####2        | 17/40 [00:03<00:04,  5.24it/s]
     488/499      0.206G     0.01759    0.007554      0.0166          3          320:
42%|####2        | 17/40 [00:03<00:04,  5.24it/s]
     488/499      0.206G     0.01759    0.007554      0.0166          3          320:
45%|####5        | 18/40 [00:03<00:04,  5.43it/s]
     488/499      0.206G     0.01702     0.00735     0.01647          1          320:
45%|####5        | 18/40 [00:03<00:04,  5.43it/s]
```

```
     488/499     0.206G    0.01702    0.00735    0.01647            1         320:
48%|####7     | 19/40 [00:03<00:03,  5.54it/s]
     488/499     0.206G    0.01676    0.00739    0.01626            2         320:
48%|####7     | 19/40 [00:03<00:03,  5.54it/s]
     488/499     0.206G    0.01676    0.00739    0.01626            2         320:
50%|#####     | 20/40 [00:03<00:03,  5.39it/s]
     488/499     0.206G    0.01697    0.007781   0.01648            4         320:
50%|#####     | 20/40 [00:03<00:03,  5.39it/s]
     488/499     0.206G    0.01697    0.007781   0.01648            4         320:
52%|#####2    | 21/40 [00:03<00:03,  5.57it/s]
     488/499     0.206G    0.01656    0.007597    0.0162            1         320:
52%|#####2    | 21/40 [00:04<00:03,  5.57it/s]
     488/499     0.206G    0.01656    0.007597    0.0162            1         320:
55%|#####5    | 22/40 [00:04<00:03,  5.64it/s]
     488/499     0.206G    0.01616    0.007402   0.01604            1         320:
55%|#####5    | 22/40 [00:04<00:03,  5.64it/s]
     488/499     0.206G    0.01616    0.007402   0.01604            1         320:
57%|#####7    | 23/40 [00:04<00:03,  5.65it/s]
     488/499     0.206G    0.01583    0.007309   0.01608            2         320:
57%|#####7    | 23/40 [00:04<00:03,  5.65it/s]
     488/499     0.206G    0.01583    0.007309   0.01608            2         320:
60%|######    | 24/40 [00:04<00:02,  5.74it/s]
     488/499     0.206G    0.01547    0.00713    0.01606            1         320:
60%|######    | 24/40 [00:04<00:02,  5.74it/s]
     488/499     0.206G    0.01547    0.00713    0.01606            1         320:
62%|######2   | 25/40 [00:04<00:02,  5.77it/s]
     488/499     0.206G    0.01518    0.007042    0.016            1         320:
62%|######2   | 25/40 [00:04<00:02,  5.77it/s]
     488/499     0.206G    0.01518    0.007042    0.016            1         320:
65%|######5   | 26/40 [00:04<00:02,  5.74it/s]
     488/499     0.206G    0.01666    0.007017    0.0168            2         320:
65%|######5   | 26/40 [00:04<00:02,  5.74it/s]
     488/499     0.206G    0.01666    0.007017    0.0168            2         320:
68%|######7   | 27/40 [00:04<00:02,  5.77it/s]
     488/499     0.206G    0.01644    0.007009   0.01673            2         320:
68%|######7   | 27/40 [00:05<00:02,  5.77it/s]
     488/499     0.206G    0.01644    0.007009   0.01673            2         320:
70%|#######   | 28/40 [00:05<00:02,  5.78it/s]
     488/499     0.206G    0.01722    0.007072   0.01683            2         320:
70%|#######   | 28/40 [00:05<00:02,  5.78it/s]
     488/499     0.206G    0.01722    0.007072   0.01683            2         320:
72%|#######2  | 29/40 [00:05<00:02,  5.44it/s]
     488/499     0.206G    0.01768    0.007259    0.0169            4         320:
72%|#######2  | 29/40 [00:05<00:02,  5.44it/s]
     488/499     0.206G    0.01768    0.007259    0.0169            4         320:
75%|#######5  | 30/40 [00:05<00:01,  5.47it/s]
     488/499     0.206G    0.01788    0.007401   0.01695            4         320:
75%|#######5  | 30/40 [00:05<00:01,  5.47it/s]
```

```
   488/499      0.206G     0.01788    0.007401    0.01695         4        320:
78%|#######7  | 31/40 [00:05<00:01,  5.57it/s]
   488/499      0.206G     0.01844     0.00774    0.01722         4        320:
78%|#######7  | 31/40 [00:05<00:01,  5.57it/s]
   488/499      0.206G     0.01844     0.00774    0.01722         4        320:
80%|########  | 32/40 [00:05<00:01,  5.48it/s]
   488/499      0.206G     0.01819    0.007658    0.01734         2        320:
80%|########  | 32/40 [00:05<00:01,  5.48it/s]
   488/499      0.206G     0.01819    0.007658    0.01734         2        320:
82%|########2 | 33/40 [00:05<00:01,  5.72it/s]
   488/499      0.206G     0.01817    0.007898    0.01734         4        320:
82%|########2 | 33/40 [00:06<00:01,  5.72it/s]
   488/499      0.206G     0.01817    0.007898    0.01734         4        320:
85%|########5 | 34/40 [00:06<00:01,  5.46it/s]
   488/499      0.206G     0.01808    0.007909     0.0175         2        320:
85%|########5 | 34/40 [00:06<00:01,  5.46it/s]
   488/499      0.206G     0.01808    0.007909     0.0175         2        320:
88%|########7 | 35/40 [00:06<00:00,  5.55it/s]
   488/499      0.206G     0.01822    0.007847    0.01743         2        320:
88%|########7 | 35/40 [00:06<00:00,  5.55it/s]
   488/499      0.206G     0.01822    0.007847    0.01743         2        320:
90%|######### | 36/40 [00:06<00:00,  5.61it/s]
   488/499      0.206G     0.01914    0.007842    0.01761         2        320:
90%|######### | 36/40 [00:06<00:00,  5.61it/s]
   488/499      0.206G     0.01914    0.007842    0.01761         2        320:
92%|#########2| 37/40 [00:06<00:00,  5.39it/s]
   488/499      0.206G      0.0189    0.007763    0.01743         1        320:
92%|#########2| 37/40 [00:06<00:00,  5.39it/s]
   488/499      0.206G      0.0189    0.007763    0.01743         1        320:
95%|#########5| 38/40 [00:06<00:00,  5.64it/s]
   488/499      0.206G     0.01893    0.007657    0.01761         1        320:
95%|#########5| 38/40 [00:07<00:00,  5.64it/s]
   488/499      0.206G     0.01893    0.007657    0.01761         1        320:
98%|#########7| 39/40 [00:07<00:00,  5.54it/s]
   488/499      0.206G      0.0189    0.007864    0.01757         4        320:
98%|#########7| 39/40 [00:07<00:00,  5.54it/s]
   488/499      0.206G      0.0189    0.007864    0.01757         4        320:
100%|##########| 40/40 [00:07<00:00,  5.48it/s]
   488/499      0.206G      0.0189    0.007864    0.01757         4        320:
100%|##########| 40/40 [00:07<00:00,  5.52it/s]


            Class      Images  Instances           P           R       mAP50
mAP50-95:    0%|            | 0/20 [00:00<?, ?it/s]
            Class      Images  Instances           P           R       mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:01, 17.40it/s]
            Class      Images  Instances           P           R       mAP50
mAP50-95:   20%|##         | 4/20 [00:00<00:00, 18.25it/s]
            Class      Images  Instances           P           R       mAP50
```

```
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 18.25it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 18.27it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 16.45it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 17.11it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 17.46it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 16.96it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.99it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.36it/s]
              Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.56it/s]
                all         40         40       0.98      0.975      0.991
0.801

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
    489/499     0.206G   0.009581   0.003236    0.01217          1       320:
0%|          | 0/40 [00:00<?, ?it/s]
    489/499     0.206G   0.009581   0.003236    0.01217          1       320:
2%|2         | 1/40 [00:00<00:07,  5.24it/s]
    489/499     0.206G    0.01752   0.003236    0.01426          1       320:
2%|2         | 1/40 [00:00<00:07,  5.24it/s]
    489/499     0.206G    0.01752   0.003236    0.01426          1       320:
5%|5         | 2/40 [00:00<00:07,  5.29it/s]
    489/499     0.206G    0.02611   0.004235    0.01617          2       320:
5%|5         | 2/40 [00:00<00:07,  5.29it/s]
    489/499     0.206G    0.02611   0.004235    0.01617          2       320:
8%|7         | 3/40 [00:00<00:07,  5.12it/s]
    489/499     0.206G    0.02536     0.0073    0.01801          4       320:
8%|7         | 3/40 [00:00<00:07,  5.12it/s]
    489/499     0.206G    0.02536     0.0073    0.01801          4       320:
10%|#        | 4/40 [00:00<00:07,  4.87it/s]
    489/499     0.206G    0.02806   0.007216    0.01863          2       320:
10%|#        | 4/40 [00:00<00:07,  4.87it/s]
    489/499     0.206G    0.02806   0.007216    0.01863          2       320:
12%|#2       | 5/40 [00:00<00:06,  5.03it/s]
    489/499     0.206G    0.02479   0.006519    0.01863          1       320:
12%|#2       | 5/40 [00:01<00:06,  5.03it/s]
    489/499     0.206G    0.02479   0.006519    0.01863          1       320:
15%|#5       | 6/40 [00:01<00:06,  5.12it/s]
    489/499     0.206G    0.02893    0.00651     0.0183          2       320:
```

294

```
15%|#5           | 6/40 [00:01<00:06,  5.12it/s]
    489/499    0.206G    0.02893    0.00651     0.0183      2        320:
18%|#7           | 7/40 [00:01<00:06,  5.05it/s]
    489/499    0.206G    0.02751    0.006134    0.01775     1        320:
18%|#7           | 7/40 [00:01<00:06,  5.05it/s]
    489/499    0.206G    0.02751    0.006134    0.01775     1        320:
20%|##           | 8/40 [00:01<00:06,  5.14it/s]
    489/499    0.206G    0.02673    0.006313    0.01738     2        320:
20%|##           | 8/40 [00:01<00:06,  5.14it/s]
    489/499    0.206G    0.02673    0.006313    0.01738     2        320:
22%|##2          | 9/40 [00:01<00:06,  4.94it/s]
    489/499    0.206G    0.02501    0.006379    0.01789     2        320:
22%|##2          | 9/40 [00:01<00:06,  4.94it/s]
    489/499    0.206G    0.02501    0.006379    0.01789     2        320:
25%|##5          | 10/40 [00:01<00:05,  5.06it/s]
    489/499    0.206G    0.02653    0.006619    0.01816     3        320:
25%|##5          | 10/40 [00:02<00:05,  5.06it/s]
    489/499    0.206G    0.02653    0.006619    0.01816     3        320:
28%|##7          | 11/40 [00:02<00:06,  4.72it/s]
    489/499    0.206G    0.02516    0.006319    0.01767     1        320:
28%|##7          | 11/40 [00:02<00:06,  4.72it/s]
    489/499    0.206G    0.02516    0.006319    0.01767     1        320:
30%|###          | 12/40 [00:02<00:05,  4.83it/s]
    489/499    0.206G    0.02411    0.006201    0.01731     1        320:
30%|###          | 12/40 [00:02<00:05,  4.83it/s]
    489/499    0.206G    0.02411    0.006201    0.01731     1        320:
32%|###2         | 13/40 [00:02<00:05,  5.09it/s]
    489/499    0.206G    0.02287    0.00596     0.01701     1        320:
32%|###2         | 13/40 [00:02<00:05,  5.09it/s]
    489/499    0.206G    0.02287    0.00596     0.01701     1        320:
35%|###5         | 14/40 [00:02<00:05,  5.15it/s]
    489/499    0.206G    0.02214    0.005964    0.01667     2        320:
35%|###5         | 14/40 [00:02<00:05,  5.15it/s]
    489/499    0.206G    0.02214    0.005964    0.01667     2        320:
38%|###7         | 15/40 [00:02<00:05,  4.96it/s]
    489/499    0.206G    0.02316    0.006414    0.01735     4        320:
38%|###7         | 15/40 [00:03<00:05,  4.96it/s]
    489/499    0.206G    0.02316    0.006414    0.01735     4        320:
40%|####         | 16/40 [00:03<00:04,  5.07it/s]
    489/499    0.206G    0.02328    0.006437    0.0171      2        320:
40%|####         | 16/40 [00:03<00:04,  5.07it/s]
    489/499    0.206G    0.02328    0.006437    0.0171      2        320:
42%|####2        | 17/40 [00:03<00:04,  5.12it/s]
    489/499    0.206G    0.02255    0.006413    0.01722     2        320:
42%|####2        | 17/40 [00:03<00:04,  5.12it/s]
    489/499    0.206G    0.02255    0.006413    0.01722     2        320:
45%|####5        | 18/40 [00:03<00:04,  5.19it/s]
    489/499    0.206G    0.02304    0.006493    0.01852     2        320:
```

```
45%|####5       | 18/40 [00:03<00:04,  5.19it/s]
     489/499     0.206G     0.02304   0.006493   0.01852         2        320:
48%|####7       | 19/40 [00:03<00:04,  5.10it/s]
     489/499     0.206G     0.02293   0.006483   0.01832         1        320:
48%|####7       | 19/40 [00:03<00:04,  5.10it/s]
     489/499     0.206G     0.02293   0.006483   0.01832         1        320:
50%|#####       | 20/40 [00:03<00:03,  5.28it/s]
     489/499     0.206G     0.02227   0.006326   0.01848         1        320:
50%|#####       | 20/40 [00:04<00:03,  5.28it/s]
     489/499     0.206G     0.02227   0.006326   0.01848         1        320:
52%|#####2      | 21/40 [00:04<00:03,  5.43it/s]
     489/499     0.206G     0.02218   0.006814   0.01847         4        320:
52%|#####2      | 21/40 [00:04<00:03,  5.43it/s]
     489/499     0.206G     0.02218   0.006814   0.01847         4        320:
55%|#####5      | 22/40 [00:04<00:03,  5.54it/s]
     489/499     0.206G     0.02388   0.006868   0.01849         2        320:
55%|#####5      | 22/40 [00:04<00:03,  5.54it/s]
     489/499     0.206G     0.02388   0.006868   0.01849         2        320:
57%|#####7      | 23/40 [00:04<00:03,  5.21it/s]
     489/499     0.206G      0.0244   0.007082   0.01875         4        320:
57%|#####7      | 23/40 [00:04<00:03,  5.21it/s]
     489/499     0.206G      0.0244   0.007082   0.01875         4        320:
60%|######      | 24/40 [00:04<00:02,  5.38it/s]
     489/499     0.206G     0.02521   0.007067   0.01854         2        320:
60%|######      | 24/40 [00:04<00:02,  5.38it/s]
     489/499     0.206G     0.02521   0.007067   0.01854         2        320:
62%|######2     | 25/40 [00:04<00:02,  5.42it/s]
     489/499     0.206G     0.02608   0.007229   0.01947         2        320:
62%|######2     | 25/40 [00:05<00:02,  5.42it/s]
     489/499     0.206G     0.02608   0.007229   0.01947         2        320:
65%|######5     | 26/40 [00:05<00:02,  5.31it/s]
     489/499     0.206G     0.02565   0.007187   0.01937         2        320:
65%|######5     | 26/40 [00:05<00:02,  5.31it/s]
     489/499     0.206G     0.02565   0.007187   0.01937         2        320:
68%|######7     | 27/40 [00:05<00:02,  5.46it/s]
     489/499     0.206G     0.02552   0.007575   0.01941         4        320:
68%|######7     | 27/40 [00:05<00:02,  5.46it/s]
     489/499     0.206G     0.02552   0.007575   0.01941         4        320:
70%|#######     | 28/40 [00:05<00:02,  5.27it/s]
     489/499     0.206G     0.02507   0.007457   0.01925         1        320:
70%|#######     | 28/40 [00:05<00:02,  5.27it/s]
     489/499     0.206G     0.02507   0.007457   0.01925         1        320:
72%|#######2    | 29/40 [00:05<00:02,  5.42it/s]
     489/499     0.206G     0.02479   0.007493   0.01927         2        320:
72%|#######2    | 29/40 [00:05<00:02,  5.42it/s]
     489/499     0.206G     0.02479   0.007493   0.01927         2        320:
75%|#######5    | 30/40 [00:05<00:01,  5.68it/s]
     489/499     0.206G     0.02484   0.007552   0.01933         2        320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.68it/s]
      489/499      0.206G    0.02484    0.007552    0.01933         2       320:
78%|#######7  | 31/40 [00:05<00:01,  5.41it/s]
      489/499      0.206G    0.02455    0.007544    0.01931         2       320:
78%|#######7  | 31/40 [00:06<00:01,  5.41it/s]
      489/499      0.206G    0.02455    0.007544    0.01931         2       320:
80%|########  | 32/40 [00:06<00:01,  5.68it/s]
      489/499      0.206G    0.02409    0.007404    0.01916         1       320:
80%|########  | 32/40 [00:06<00:01,  5.68it/s]
      489/499      0.206G    0.02409    0.007404    0.01916         1       320:
82%|########2 | 33/40 [00:06<00:01,  5.57it/s]
      489/499      0.206G    0.02399    0.007429    0.01899         2       320:
82%|########2 | 33/40 [00:06<00:01,  5.57it/s]
      489/499      0.206G    0.02399    0.007429    0.01899         2       320:
85%|########5 | 34/40 [00:06<00:01,  5.34it/s]
      489/499      0.206G    0.02369    0.007312    0.01884         1       320:
85%|########5 | 34/40 [00:06<00:01,  5.34it/s]
      489/499      0.206G    0.02369    0.007312    0.01884         1       320:
88%|########7 | 35/40 [00:06<00:00,  5.62it/s]
      489/499      0.206G    0.02379    0.007236    0.01867         1       320:
88%|########7 | 35/40 [00:06<00:00,  5.62it/s]
      489/499      0.206G    0.02379    0.007236    0.01867         1       320:
90%|######### | 36/40 [00:06<00:00,  5.68it/s]
      489/499      0.206G    0.02344    0.00712     0.0185          1       320:
90%|######### | 36/40 [00:07<00:00,  5.68it/s]
      489/499      0.206G    0.02344    0.00712     0.0185          1       320:
92%|#########2| 37/40 [00:07<00:00,  5.71it/s]
      489/499      0.206G    0.0237     0.007104    0.01838         2       320:
92%|#########2| 37/40 [00:07<00:00,  5.71it/s]
      489/499      0.206G    0.0237     0.007104    0.01838         2       320:
95%|#########5| 38/40 [00:07<00:00,  5.75it/s]
      489/499      0.206G    0.02333    0.006987    0.01819         1       320:
95%|#########5| 38/40 [00:07<00:00,  5.75it/s]
      489/499      0.206G    0.02333    0.006987    0.01819         1       320:
98%|#########7| 39/40 [00:07<00:00,  5.77it/s]
      489/499      0.206G    0.02315    0.00725     0.01822         4       320:
98%|#########7| 39/40 [00:07<00:00,  5.77it/s]
      489/499      0.206G    0.02315    0.00725     0.01822         4       320:
100%|##########| 40/40 [00:07<00:00,  5.46it/s]
      489/499      0.206G    0.02315    0.00725     0.01822         4       320:
100%|##########| 40/40 [00:07<00:00,  5.29it/s]


              Class      Images  Instances          P          R       mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances          P          R       mAP50
mAP50-95:  10%|#            | 2/20 [00:00<00:01, 14.22it/s]
              Class      Images  Instances          P          R       mAP50
mAP50-95:  20%|##           | 4/20 [00:00<00:00, 16.36it/s]
```

```
            Class      Images  Instances         P           R        mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 17.19it/s]
            Class      Images  Instances         P           R        mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 16.73it/s]
            Class      Images  Instances         P           R        mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 16.26it/s]
            Class      Images  Instances         P           R        mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 16.90it/s]
            Class      Images  Instances         P           R        mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 17.32it/s]
            Class      Images  Instances         P           R        mAP50
mAP50-95:  85%|########5  | 17/20 [00:01<00:00, 17.48it/s]
            Class      Images  Instances         P           R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.89it/s]
            Class      Images  Instances         P           R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.21it/s]
              all         40        40       0.981       0.975        0.992
0.799

      Epoch   GPU_mem    box_loss   obj_loss   cls_loss  Instances      Size

  0%|          | 0/40 [00:00<?, ?it/s]
    490/499    0.206G     0.03064    0.01045    0.01517          2       320:
0%|          | 0/40 [00:00<?, ?it/s]
    490/499    0.206G     0.03064    0.01045    0.01517          2       320:
2%|2         | 1/40 [00:00<00:06,  5.76it/s]
    490/499    0.206G     0.03623   0.008457     0.0148          2       320:
2%|2         | 1/40 [00:00<00:06,  5.76it/s]
    490/499    0.206G     0.03623   0.008457     0.0148          2       320:
5%|5         | 2/40 [00:00<00:07,  5.24it/s]
    490/499    0.206G     0.02855    0.00722     0.0133          1       320:
5%|5         | 2/40 [00:00<00:07,  5.24it/s]
    490/499    0.206G     0.02855    0.00722     0.0133          1       320:
8%|7         | 3/40 [00:00<00:07,  5.27it/s]
    490/499    0.206G     0.02431   0.006559    0.01337          1       320:
8%|7         | 3/40 [00:00<00:07,  5.27it/s]
    490/499    0.206G     0.02431   0.006559    0.01337          1       320:
10%|#         | 4/40 [00:00<00:06,  5.49it/s]
    490/499    0.206G      0.0228   0.007274    0.01517          4       320:
10%|#         | 4/40 [00:00<00:06,  5.49it/s]
    490/499    0.206G      0.0228   0.007274    0.01517          4       320:
12%|#2        | 5/40 [00:00<00:06,  5.43it/s]
    490/499    0.206G     0.02139   0.006662    0.01491          1       320:
12%|#2        | 5/40 [00:01<00:06,  5.43it/s]
    490/499    0.206G     0.02139   0.006662    0.01491          1       320:
15%|#5        | 6/40 [00:01<00:06,  5.36it/s]
    490/499    0.206G     0.02412    0.00693    0.01696          3       320:
15%|#5        | 6/40 [00:01<00:06,  5.36it/s]
```

```
    490/499      0.206G     0.02412    0.00693     0.01696         3          320:
18%|#7        | 7/40 [00:01<00:06,  5.49it/s]
    490/499      0.206G      0.0259    0.007646    0.01819         4          320:
18%|#7        | 7/40 [00:01<00:06,  5.49it/s]
    490/499      0.206G      0.0259    0.007646    0.01819         4          320:
20%|##        | 8/40 [00:01<00:06,  5.30it/s]
    490/499      0.206G      0.0261    0.008402    0.0189          4          320:
20%|##        | 8/40 [00:01<00:06,  5.30it/s]
    490/499      0.206G      0.0261    0.008402    0.0189          4          320:
22%|##2       | 9/40 [00:01<00:05,  5.45it/s]
    490/499      0.206G     0.02495    0.008542    0.01845         2          320:
22%|##2       | 9/40 [00:01<00:05,  5.45it/s]
    490/499      0.206G     0.02495    0.008542    0.01845         2          320:
25%|##5       | 10/40 [00:01<00:05,  5.28it/s]
    490/499      0.206G      0.0237    0.008047    0.0179          1          320:
25%|##5       | 10/40 [00:02<00:05,  5.28it/s]
    490/499      0.206G      0.0237    0.008047    0.0179          1          320:
28%|##7       | 11/40 [00:02<00:05,  5.29it/s]
    490/499      0.206G     0.02255    0.008125    0.01766         4          320:
28%|##7       | 11/40 [00:02<00:05,  5.29it/s]
    490/499      0.206G     0.02255    0.008125    0.01766         4          320:
30%|###       | 12/40 [00:02<00:05,  5.42it/s]
    490/499      0.206G     0.02129    0.007777    0.01768         1          320:
30%|###       | 12/40 [00:02<00:05,  5.42it/s]
    490/499      0.206G     0.02129    0.007777    0.01768         1          320:
32%|###2      | 13/40 [00:02<00:04,  5.53it/s]
    490/499      0.206G     0.02152    0.007593    0.0183          2          320:
32%|###2      | 13/40 [00:02<00:04,  5.53it/s]
    490/499      0.206G     0.02152    0.007593    0.0183          2          320:
35%|###5      | 14/40 [00:02<00:04,  5.47it/s]
    490/499      0.206G     0.02075    0.007423    0.01824         2          320:
35%|###5      | 14/40 [00:02<00:04,  5.47it/s]
    490/499      0.206G     0.02075    0.007423    0.01824         2          320:
38%|###7      | 15/40 [00:02<00:04,  5.71it/s]
    490/499      0.206G     0.02011    0.00717     0.01786         1          320:
38%|###7      | 15/40 [00:02<00:04,  5.71it/s]
    490/499      0.206G     0.02011    0.00717     0.01786         1          320:
40%|####      | 16/40 [00:02<00:04,  5.74it/s]
    490/499      0.206G     0.01947    0.006936    0.0175          1          320:
40%|####      | 16/40 [00:03<00:04,  5.74it/s]
    490/499      0.206G     0.01947    0.006936    0.0175          1          320:
42%|####2     | 17/40 [00:03<00:03,  5.77it/s]
    490/499      0.206G     0.01897    0.00675     0.01729         1          320:
42%|####2     | 17/40 [00:03<00:03,  5.77it/s]
    490/499      0.206G     0.01897    0.00675     0.01729         1          320:
45%|####5     | 18/40 [00:03<00:03,  5.78it/s]
    490/499      0.206G     0.01944    0.006854    0.01789         2          320:
45%|####5     | 18/40 [00:03<00:03,  5.78it/s]
```

```
     490/499      0.206G      0.01944    0.006854     0.01789         2          320:
48%|####7      | 19/40 [00:03<00:03,  5.64it/s]
     490/499      0.206G      0.01952    0.006916     0.01819         2          320:
48%|####7      | 19/40 [00:03<00:03,  5.64it/s]
     490/499      0.206G      0.01952    0.006916     0.01819         2          320:
50%|#####      | 20/40 [00:03<00:03,  5.69it/s]
     490/499      0.206G      0.02116    0.006987     0.01811         3          320:
50%|#####      | 20/40 [00:03<00:03,  5.69it/s]
     490/499      0.206G      0.02116    0.006987     0.01811         3          320:
52%|#####2     | 21/40 [00:03<00:03,  5.55it/s]
     490/499      0.206G      0.02074    0.006839     0.01809         1          320:
52%|#####2     | 21/40 [00:04<00:03,  5.55it/s]
     490/499      0.206G      0.02074    0.006839     0.01809         1          320:
55%|#####5     | 22/40 [00:04<00:03,  5.35it/s]
     490/499      0.206G       0.0214    0.007028     0.01826         2          320:
55%|#####5     | 22/40 [00:04<00:03,  5.35it/s]
     490/499      0.206G       0.0214    0.007028     0.01826         2          320:
57%|#####7     | 23/40 [00:04<00:03,  5.48it/s]
     490/499      0.206G      0.02094    0.007255     0.01805         4          320:
57%|#####7     | 23/40 [00:04<00:03,  5.48it/s]
     490/499      0.206G      0.02094    0.007255     0.01805         4          320:
60%|######     | 24/40 [00:04<00:03,  5.28it/s]
     490/499      0.206G      0.02111    0.007483     0.01814         4          320:
60%|######     | 24/40 [00:04<00:03,  5.28it/s]
     490/499      0.206G      0.02111    0.007483     0.01814         4          320:
62%|######2    | 25/40 [00:04<00:02,  5.30it/s]
     490/499      0.206G      0.02102    0.007422     0.01796         1          320:
62%|######2    | 25/40 [00:04<00:02,  5.30it/s]
     490/499      0.206G      0.02102    0.007422     0.01796         1          320:
65%|######5    | 26/40 [00:04<00:02,  5.44it/s]
     490/499      0.206G      0.02129    0.007581     0.01804         4          320:
65%|######5    | 26/40 [00:04<00:02,  5.44it/s]
     490/499      0.206G      0.02129    0.007581     0.01804         4          320:
68%|######7    | 27/40 [00:04<00:02,  5.26it/s]
     490/499      0.206G       0.0212    0.007867      0.0182         4          320:
68%|######7    | 27/40 [00:05<00:02,  5.26it/s]
     490/499      0.206G       0.0212    0.007867      0.0182         4          320:
70%|#######    | 28/40 [00:05<00:02,  5.41it/s]
     490/499      0.206G        0.021    0.008211     0.01824         4          320:
70%|#######    | 28/40 [00:05<00:02,  5.41it/s]
     490/499      0.206G        0.021    0.008211     0.01824         4          320:
72%|#######2   | 29/40 [00:05<00:01,  5.52it/s]
     490/499      0.206G      0.02061    0.008163     0.01805         2          320:
72%|#######2   | 29/40 [00:05<00:01,  5.52it/s]
     490/499      0.206G      0.02061    0.008163     0.01805         2          320:
75%|#######5   | 30/40 [00:05<00:01,  5.59it/s]
     490/499      0.206G      0.02031    0.008063     0.01783         1          320:
75%|#######5   | 30/40 [00:05<00:01,  5.59it/s]
```

```
    490/499      0.206G     0.02031     0.008063     0.01783            1          320:
78%|#######7  | 31/40 [00:05<00:01,  5.66it/s]
    490/499      0.206G      0.0208     0.008016      0.0179            2          320:
78%|#######7  | 31/40 [00:05<00:01,  5.66it/s]
    490/499      0.206G      0.0208     0.008016      0.0179            2          320:
80%|########  | 32/40 [00:05<00:01,  5.41it/s]
    490/499      0.206G     0.02129     0.008028     0.01792            3          320:
80%|########  | 32/40 [00:06<00:01,  5.41it/s]
    490/499      0.206G     0.02129     0.008028     0.01792            3          320:
82%|########2 | 33/40 [00:06<00:01,  5.40it/s]
    490/499      0.206G     0.02089     0.007896      0.0179            1          320:
82%|########2 | 33/40 [00:06<00:01,  5.40it/s]
    490/499      0.206G     0.02089     0.007896      0.0179            1          320:
85%|########5 | 34/40 [00:06<00:01,  5.52it/s]
    490/499      0.206G     0.02081     0.008016     0.01827            3          320:
85%|########5 | 34/40 [00:06<00:01,  5.52it/s]
    490/499      0.206G     0.02081     0.008016     0.01827            3          320:
88%|########7 | 35/40 [00:06<00:00,  5.48it/s]
    490/499      0.206G     0.02065     0.007909     0.01809            1          320:
88%|########7 | 35/40 [00:06<00:00,  5.48it/s]
    490/499      0.206G     0.02065     0.007909     0.01809            1          320:
90%|######### | 36/40 [00:06<00:00,  5.68it/s]
    490/499      0.206G     0.02049     0.007774     0.01794            1          320:
90%|######### | 36/40 [00:06<00:00,  5.68it/s]
    490/499      0.206G     0.02049     0.007774     0.01794            1          320:
92%|#########2| 37/40 [00:06<00:00,  5.43it/s]
    490/499      0.206G     0.02035     0.007984     0.01818            4          320:
92%|#########2| 37/40 [00:06<00:00,  5.43it/s]
    490/499      0.206G     0.02035     0.007984     0.01818            4          320:
95%|#########5| 38/40 [00:06<00:00,  5.12it/s]
    490/499      0.206G     0.02013     0.007862     0.01804            1          320:
95%|#########5| 38/40 [00:07<00:00,  5.12it/s]
    490/499      0.206G     0.02013     0.007862     0.01804            1          320:
98%|#########7| 39/40 [00:07<00:00,  5.06it/s]
    490/499      0.206G     0.02077     0.007863      0.0179            2          320:
98%|#########7| 39/40 [00:07<00:00,  5.06it/s]
    490/499      0.206G     0.02077     0.007863      0.0179            2          320:
100%|##########| 40/40 [00:07<00:00,  5.02it/s]
    490/499      0.206G     0.02077     0.007863      0.0179            2          320:
100%|##########| 40/40 [00:07<00:00,  5.42it/s]


               Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|             | 0/20 [00:00<?, ?it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:01, 11.48it/s]
               Class     Images  Instances          P          R      mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:01, 13.74it/s]
               Class     Images  Instances          P          R      mAP50
```

301

```
mAP50-95:  30%|###        | 6/20 [00:00<00:01, 13.95it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 14.53it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 15.13it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 14.81it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 14.99it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:01<00:00, 14.87it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.23it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.91it/s]
                Class     Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.66it/s]
                  all         40         40      0.981      0.975      0.992
0.799

      Epoch    GPU_mem    box_loss   obj_loss   cls_loss  Instances        Size

   0%|          | 0/40 [00:00<?, ?it/s]
     491/499    0.206G     0.01447   0.006719    0.01583          2        320:
 0%|          | 0/40 [00:00<?, ?it/s]
     491/499    0.206G     0.01447   0.006719    0.01583          2        320:
 2%|2         | 1/40 [00:00<00:07,  5.33it/s]
     491/499    0.206G     0.01865      0.011    0.01779          4        320:
 2%|2         | 1/40 [00:00<00:07,  5.33it/s]
     491/499    0.206G     0.01865      0.011    0.01779          4        320:
 5%|5         | 2/40 [00:00<00:07,  5.30it/s]
     491/499    0.206G     0.02039    0.01232    0.01889          4        320:
 5%|5         | 2/40 [00:00<00:07,  5.30it/s]
     491/499    0.206G     0.02039    0.01232    0.01889          4        320:
 8%|7         | 3/40 [00:00<00:06,  5.31it/s]
     491/499    0.206G     0.02413     0.0108    0.01865          2        320:
 8%|7         | 3/40 [00:00<00:06,  5.31it/s]
     491/499    0.206G     0.02413     0.0108    0.01865          2        320:
10%|#         | 4/40 [00:00<00:07,  4.99it/s]
     491/499    0.206G     0.02575    0.01175    0.01864          4        320:
10%|#         | 4/40 [00:00<00:07,  4.99it/s]
     491/499    0.206G     0.02575    0.01175    0.01864          4        320:
12%|#2        | 5/40 [00:00<00:06,  5.24it/s]
     491/499    0.206G     0.02278    0.01032    0.01871          1        320:
12%|#2        | 5/40 [00:01<00:06,  5.24it/s]
     491/499    0.206G     0.02278    0.01032    0.01871          1        320:
15%|#5        | 6/40 [00:01<00:06,  5.43it/s]
     491/499    0.206G     0.02154   0.009359    0.01781          1        320:
```

```
15%|#5          | 6/40 [00:01<00:06,  5.43it/s]
    491/499      0.206G    0.02154   0.009359    0.01781          1        320:
18%|#7          | 7/40 [00:01<00:06,  5.40it/s]
    491/499      0.206G    0.02105   0.01024     0.01763          4        320:
18%|#7          | 7/40 [00:01<00:06,  5.40it/s]
    491/499      0.206G    0.02105   0.01024     0.01763          4        320:
20%|##          | 8/40 [00:01<00:05,  5.50it/s]
    491/499      0.206G    0.02131   0.01076     0.01812          4        320:
20%|##          | 8/40 [00:01<00:05,  5.50it/s]
    491/499      0.206G    0.02131   0.01076     0.01812          4        320:
22%|##2         | 9/40 [00:01<00:05,  5.31it/s]
    491/499      0.206G    0.0203    0.01007     0.01763          1        320:
22%|##2         | 9/40 [00:01<00:05,  5.31it/s]
    491/499      0.206G    0.0203    0.01007     0.01763          1        320:
25%|##5         | 10/40 [00:01<00:05,  5.46it/s]
    491/499      0.206G    0.0215    0.009928    0.01729          2        320:
25%|##5         | 10/40 [00:02<00:05,  5.46it/s]
    491/499      0.206G    0.0215    0.009928    0.01729          2        320:
28%|##7         | 11/40 [00:02<00:05,  5.56it/s]
    491/499      0.206G    0.02053   0.009338    0.01716          1        320:
28%|##7         | 11/40 [00:02<00:05,  5.56it/s]
    491/499      0.206G    0.02053   0.009338    0.01716          1        320:
30%|###         | 12/40 [00:02<00:05,  5.35it/s]
    491/499      0.206G    0.02108   0.009848    0.0178           4        320:
30%|###         | 12/40 [00:02<00:05,  5.35it/s]
    491/499      0.206G    0.02108   0.009848    0.0178           4        320:
32%|###2        | 13/40 [00:02<00:05,  5.34it/s]
    491/499      0.206G    0.02117   0.009586    0.01753          2        320:
32%|###2        | 13/40 [00:02<00:05,  5.34it/s]
    491/499      0.206G    0.02117   0.009586    0.01753          2        320:
35%|###5        | 14/40 [00:02<00:04,  5.32it/s]
    491/499      0.206G    0.02174   0.009923    0.01805          4        320:
35%|###5        | 14/40 [00:02<00:04,  5.32it/s]
    491/499      0.206G    0.02174   0.009923    0.01805          4        320:
38%|###7        | 15/40 [00:02<00:04,  5.33it/s]
    491/499      0.206G    0.02101   0.009902    0.01797          3        320:
38%|###7        | 15/40 [00:02<00:04,  5.33it/s]
    491/499      0.206G    0.02101   0.009902    0.01797          3        320:
40%|####        | 16/40 [00:02<00:04,  5.33it/s]
    491/499      0.206G    0.02022   0.009459    0.01759          1        320:
40%|####        | 16/40 [00:03<00:04,  5.33it/s]
    491/499      0.206G    0.02022   0.009459    0.01759          1        320:
42%|####2       | 17/40 [00:03<00:04,  5.44it/s]
    491/499      0.206G    0.02137   0.00948     0.0189           2        320:
42%|####2       | 17/40 [00:03<00:04,  5.44it/s]
    491/499      0.206G    0.02137   0.00948     0.0189           2        320:
45%|####5       | 18/40 [00:03<00:03,  5.55it/s]
    491/499      0.206G    0.02241   0.00938     0.02038          2        320:
```

```
45%|####5      | 18/40 [00:03<00:03,  5.55it/s]
     491/499     0.206G    0.02241    0.00938    0.02038         2         320:
48%|####7      | 19/40 [00:03<00:03,  5.63it/s]
     491/499     0.206G    0.02235   0.009093    0.02051         1         320:
48%|####7      | 19/40 [00:03<00:03,  5.63it/s]
     491/499     0.206G    0.02235   0.009093    0.02051         1         320:
50%|#####      | 20/40 [00:03<00:03,  5.66it/s]
     491/499     0.206G    0.02165   0.008771    0.02026         1         320:
50%|#####      | 20/40 [00:03<00:03,  5.66it/s]
     491/499     0.206G    0.02165   0.008771    0.02026         1         320:
52%|#####2     | 21/40 [00:03<00:03,  5.71it/s]
     491/499     0.206G     0.0231   0.008625    0.02001         2         320:
52%|#####2     | 21/40 [00:04<00:03,  5.71it/s]
     491/499     0.206G     0.0231   0.008625    0.02001         2         320:
55%|#####5     | 22/40 [00:04<00:03,  5.74it/s]
     491/499     0.206G     0.0232     0.0089    0.01995         4         320:
55%|#####5     | 22/40 [00:04<00:03,  5.74it/s]
     491/499     0.206G     0.0232     0.0089    0.01995         4         320:
57%|#####7     | 23/40 [00:04<00:03,  5.59it/s]
     491/499     0.206G    0.02348   0.008829    0.02101         2         320:
57%|#####7     | 23/40 [00:04<00:03,  5.59it/s]
     491/499     0.206G    0.02348   0.008829    0.02101         2         320:
60%|######     | 24/40 [00:04<00:02,  5.66it/s]
     491/499     0.206G    0.02292   0.008632    0.02066         1         320:
60%|######     | 24/40 [00:04<00:02,  5.66it/s]
     491/499     0.206G    0.02292   0.008632    0.02066         1         320:
62%|######2    | 25/40 [00:04<00:02,  5.70it/s]
     491/499     0.206G    0.02332   0.009122    0.02069         4         320:
62%|######2    | 25/40 [00:04<00:02,  5.70it/s]
     491/499     0.206G    0.02332   0.009122    0.02069         4         320:
65%|######5    | 26/40 [00:04<00:02,  5.44it/s]
     491/499     0.206G    0.02303    0.00895     0.0205         1         320:
65%|######5    | 26/40 [00:04<00:02,  5.44it/s]
     491/499     0.206G    0.02303    0.00895     0.0205         1         320:
68%|######7    | 27/40 [00:04<00:02,  5.55it/s]
     491/499     0.206G    0.02372   0.008946    0.02041         2         320:
68%|######7    | 27/40 [00:05<00:02,  5.55it/s]
     491/499     0.206G    0.02372   0.008946    0.02041         2         320:
70%|#######    | 28/40 [00:05<00:02,  5.48it/s]
     491/499     0.206G    0.02328   0.008788    0.02012         1         320:
70%|#######    | 28/40 [00:05<00:02,  5.48it/s]
     491/499     0.206G    0.02328   0.008788    0.02012         1         320:
72%|#######2   | 29/40 [00:05<00:01,  5.55it/s]
     491/499     0.206G    0.02276   0.008684    0.01986         2         320:
72%|#######2   | 29/40 [00:05<00:01,  5.55it/s]
     491/499     0.206G    0.02276   0.008684    0.01986         2         320:
75%|#######5   | 30/40 [00:05<00:01,  5.63it/s]
     491/499     0.206G    0.02266   0.008585    0.02013         2         320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.63it/s]
    491/499        0.206G     0.02266    0.008585     0.02013         2       320:
78%|#######7  | 31/40 [00:05<00:01,  5.69it/s]
    491/499        0.206G     0.02222    0.008398     0.01991         1       320:
78%|#######7  | 31/40 [00:05<00:01,  5.69it/s]
    491/499        0.206G     0.02222    0.008398     0.01991         1       320:
80%|########  | 32/40 [00:05<00:01,  5.71it/s]
    491/499        0.206G     0.02208    0.008319     0.01987         2       320:
80%|########  | 32/40 [00:05<00:01,  5.71it/s]
    491/499        0.206G     0.02208    0.008319     0.01987         2       320:
82%|########2 | 33/40 [00:05<00:01,  5.74it/s]
    491/499        0.206G     0.02192    0.008505     0.01986         4       320:
82%|########2 | 33/40 [00:06<00:01,  5.74it/s]
    491/499        0.206G     0.02192    0.008505     0.01986         4       320:
85%|########5 | 34/40 [00:06<00:01,  5.76it/s]
    491/499        0.206G     0.02173    0.008419     0.01975         1       320:
85%|########5 | 34/40 [00:06<00:01,  5.76it/s]
    491/499        0.206G     0.02173    0.008419     0.01975         1       320:
88%|########7 | 35/40 [00:06<00:00,  5.76it/s]
    491/499        0.206G     0.02136    0.008267     0.01955         1       320:
88%|########7 | 35/40 [00:06<00:00,  5.76it/s]
    491/499        0.206G     0.02136    0.008267     0.01955         1       320:
90%|######### | 36/40 [00:06<00:00,  5.78it/s]
    491/499        0.206G     0.02119    0.008383     0.01945         4       320:
90%|######### | 36/40 [00:06<00:00,  5.78it/s]
    491/499        0.206G     0.02119    0.008383     0.01945         4       320:
92%|#########2| 37/40 [00:06<00:00,  5.49it/s]
    491/499        0.206G     0.02091    0.008261     0.01932         1       320:
92%|#########2| 37/40 [00:06<00:00,  5.49it/s]
    491/499        0.206G     0.02091    0.008261     0.01932         1       320:
95%|#########5| 38/40 [00:06<00:00,  5.57it/s]
    491/499        0.206G     0.02067    0.008131     0.01914         1       320:
95%|#########5| 38/40 [00:07<00:00,  5.57it/s]
    491/499        0.206G     0.02067    0.008131     0.01914         1       320:
98%|#########7| 39/40 [00:07<00:00,  5.64it/s]
    491/499        0.206G     0.02051    0.008126     0.01904         2       320:
98%|#########7| 39/40 [00:07<00:00,  5.64it/s]
    491/499        0.206G     0.02051    0.008126     0.01904         2       320:
100%|##########| 40/40 [00:07<00:00,  5.69it/s]
    491/499        0.206G     0.02051    0.008126     0.01904         2       320:
100%|##########| 40/40 [00:07<00:00,  5.53it/s]


             Class     Images  Instances           P          R      mAP50
mAP50-95:    0%|               | 0/20 [00:00<?, ?it/s]
             Class     Images  Instances           P          R      mAP50
mAP50-95:   10%|#             | 2/20 [00:00<00:01, 12.72it/s]
             Class     Images  Instances           P          R      mAP50
mAP50-95:   20%|##            | 4/20 [00:00<00:01, 15.50it/s]
```

```
              Class     Images  Instances          P          R       mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 14.88it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 14.41it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 15.67it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 15.78it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 16.31it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  80%|########   | 16/20 [00:01<00:00, 17.10it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 16.05it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.68it/s]
              Class     Images  Instances          P          R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.93it/s]
                all         40         40      0.981      0.975      0.991
0.802

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    492/499     0.206G   0.009498   0.007078    0.01894          2        320:
0%|           | 0/40 [00:00<?, ?it/s]
    492/499     0.206G   0.009498   0.007078    0.01894          2        320:
2%|2          | 1/40 [00:00<00:06,  5.76it/s]
    492/499     0.206G     0.0191   0.008255    0.01873          2        320:
2%|2          | 1/40 [00:00<00:06,  5.76it/s]
    492/499     0.206G     0.0191   0.008255    0.01873          2        320:
5%|5          | 2/40 [00:00<00:06,  5.79it/s]
    492/499     0.206G     0.0237    0.01064    0.02125          4        320:
5%|5          | 2/40 [00:00<00:06,  5.79it/s]
    492/499     0.206G     0.0237    0.01064    0.02125          4        320:
8%|7          | 3/40 [00:00<00:06,  5.57it/s]
    492/499     0.206G    0.01991   0.009069    0.01918          1        320:
8%|7          | 3/40 [00:00<00:06,  5.57it/s]
    492/499     0.206G    0.01991   0.009069    0.01918          1        320:
10%|#          | 4/40 [00:00<00:06,  5.63it/s]
    492/499     0.206G    0.02385    0.01075    0.02013          4        320:
10%|#          | 4/40 [00:00<00:06,  5.63it/s]
    492/499     0.206G    0.02385    0.01075    0.02013          4        320:
12%|#2         | 5/40 [00:00<00:06,  5.51it/s]
    492/499     0.206G    0.02337    0.01034    0.01913          2        320:
12%|#2         | 5/40 [00:01<00:06,  5.51it/s]
    492/499     0.206G    0.02337    0.01034    0.01913          2        320:
15%|#5         | 6/40 [00:01<00:06,  5.62it/s]
```

```
     492/499      0.206G     0.02206     0.01043     0.02043        4         320:
15%|#5         | 6/40 [00:01<00:06,  5.62it/s]
     492/499      0.206G     0.02206     0.01043     0.02043        4         320:
18%|#7         | 7/40 [00:01<00:05,  5.69it/s]
     492/499      0.206G     0.02051    0.009807     0.01985        2         320:
18%|#7         | 7/40 [00:01<00:05,  5.69it/s]
     492/499      0.206G     0.02051    0.009807     0.01985        2         320:
20%|##         | 8/40 [00:01<00:05,  5.57it/s]
     492/499      0.206G     0.01974    0.009503     0.01948        1         320:
20%|##         | 8/40 [00:01<00:05,  5.57it/s]
     492/499      0.206G     0.01974    0.009503     0.01948        1         320:
22%|##2        | 9/40 [00:01<00:05,  5.64it/s]
     492/499      0.206G     0.01957     0.01011     0.01944        4         320:
22%|##2        | 9/40 [00:01<00:05,  5.64it/s]
     492/499      0.206G     0.01957     0.01011     0.01944        4         320:
25%|##5        | 10/40 [00:01<00:05,  5.68it/s]
     492/499      0.206G     0.01961     0.01003      0.0197        3         320:
25%|##5        | 10/40 [00:01<00:05,  5.68it/s]
     492/499      0.206G     0.01961     0.01003      0.0197        3         320:
28%|##7        | 11/40 [00:01<00:05,  5.57it/s]
     492/499      0.206G      0.0193    0.009883     0.01966        2         320:
28%|##7        | 11/40 [00:02<00:05,  5.57it/s]
     492/499      0.206G      0.0193    0.009883     0.01966        2         320:
30%|###        | 12/40 [00:02<00:05,  5.49it/s]
     492/499      0.206G     0.02054    0.009614     0.02011        2         320:
30%|###        | 12/40 [00:02<00:05,  5.49it/s]
     492/499      0.206G     0.02054    0.009614     0.02011        2         320:
32%|###2       | 13/40 [00:02<00:04,  5.56it/s]
     492/499      0.206G     0.01951    0.009142     0.01974        1         320:
32%|###2       | 13/40 [00:02<00:04,  5.56it/s]
     492/499      0.206G     0.01951    0.009142     0.01974        1         320:
35%|###5       | 14/40 [00:02<00:04,  5.49it/s]
     492/499      0.206G     0.01975    0.009379     0.01992        4         320:
35%|###5       | 14/40 [00:02<00:04,  5.49it/s]
     492/499      0.206G     0.01975    0.009379     0.01992        4         320:
38%|###7       | 15/40 [00:02<00:04,  5.54it/s]
     492/499      0.206G     0.02056    0.009683     0.02001        4         320:
38%|###7       | 15/40 [00:02<00:04,  5.54it/s]
     492/499      0.206G     0.02056    0.009683     0.02001        4         320:
40%|####       | 16/40 [00:02<00:04,  5.49it/s]
     492/499      0.206G     0.02085     0.01042     0.02069        4         320:
40%|####       | 16/40 [00:03<00:04,  5.49it/s]
     492/499      0.206G     0.02085     0.01042     0.02069        4         320:
42%|####2      | 17/40 [00:03<00:04,  5.59it/s]
     492/499      0.206G     0.02089     0.01065     0.02066        4         320:
42%|####2      | 17/40 [00:03<00:04,  5.59it/s]
     492/499      0.206G     0.02089     0.01065     0.02066        4         320:
45%|####5      | 18/40 [00:03<00:03,  5.64it/s]
```

```
      492/499      0.206G     0.02088       0.0108     0.02046           4          320:
45%|####5      | 18/40 [00:03<00:03,  5.64it/s]
      492/499      0.206G     0.02088       0.0108     0.02046           4          320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
      492/499      0.206G     0.02031      0.01064     0.02009           2          320:
48%|####7      | 19/40 [00:03<00:03,  5.51it/s]
      492/499      0.206G     0.02031      0.01064     0.02009           2          320:
50%|#####      | 20/40 [00:03<00:03,  5.64it/s]
      492/499      0.206G     0.02038      0.01117     0.02022           4          320:
50%|#####      | 20/40 [00:03<00:03,  5.64it/s]
      492/499      0.206G     0.02038      0.01117     0.02022           4          320:
52%|#####2     | 21/40 [00:03<00:03,  5.50it/s]
      492/499      0.206G     0.01995      0.01091     0.01995           1          320:
52%|#####2     | 21/40 [00:03<00:03,  5.50it/s]
      492/499      0.206G     0.01995      0.01091     0.01995           1          320:
55%|#####5     | 22/40 [00:03<00:03,  5.79it/s]
      492/499      0.206G     0.02124      0.01073     0.02055           2          320:
55%|#####5     | 22/40 [00:04<00:03,  5.79it/s]
      492/499      0.206G     0.02124      0.01073     0.02055           2          320:
57%|#####7     | 23/40 [00:04<00:02,  5.80it/s]
      492/499      0.206G     0.02079      0.01049     0.02015           1          320:
57%|#####7     | 23/40 [00:04<00:02,  5.80it/s]
      492/499      0.206G     0.02079      0.01049     0.02015           1          320:
60%|######     | 24/40 [00:04<00:02,  5.79it/s]
      492/499      0.206G     0.02081      0.01056     0.02022           4          320:
60%|######     | 24/40 [00:04<00:02,  5.79it/s]
      492/499      0.206G     0.02081      0.01056     0.02022           4          320:
62%|######2    | 25/40 [00:04<00:02,  5.64it/s]
      492/499      0.206G     0.02076      0.01053     0.02029           2          320:
62%|######2    | 25/40 [00:04<00:02,  5.64it/s]
      492/499      0.206G     0.02076      0.01053     0.02029           2          320:
65%|######5    | 26/40 [00:04<00:02,  5.54it/s]
      492/499      0.206G     0.02037      0.01037     0.02009           2          320:
65%|######5    | 26/40 [00:04<00:02,  5.54it/s]
      492/499      0.206G     0.02037      0.01037     0.02009           2          320:
68%|######7    | 27/40 [00:04<00:02,  5.35it/s]
      492/499      0.206G     0.02043      0.01061     0.02002           4          320:
68%|######7    | 27/40 [00:05<00:02,  5.35it/s]
      492/499      0.206G     0.02043      0.01061     0.02002           4          320:
70%|#######    | 28/40 [00:05<00:02,  5.19it/s]
      492/499      0.206G     0.02057      0.01081     0.01987           4          320:
70%|#######    | 28/40 [00:05<00:02,  5.19it/s]
      492/499      0.206G     0.02057      0.01081     0.01987           4          320:
72%|#######2   | 29/40 [00:05<00:02,  5.10it/s]
      492/499      0.206G     0.02134      0.01086     0.01973           2          320:
72%|#######2   | 29/40 [00:05<00:02,  5.10it/s]
      492/499      0.206G     0.02134      0.01086     0.01973           2          320:
75%|#######5   | 30/40 [00:05<00:01,  5.02it/s]
```

```
     492/499      0.206G     0.02118     0.01088      0.0196          4          320:
75%|#######5   | 30/40 [00:05<00:01,  5.02it/s]
     492/499      0.206G     0.02118     0.01088      0.0196          4          320:
78%|#######7   | 31/40 [00:05<00:01,  4.88it/s]
     492/499      0.206G     0.02172     0.01072      0.0199          2          320:
78%|#######7   | 31/40 [00:05<00:01,  4.88it/s]
     492/499      0.206G     0.02172     0.01072      0.0199          2          320:
80%|########   | 32/40 [00:05<00:01,  4.82it/s]
     492/499      0.206G     0.02214     0.01085     0.01987          4          320:
80%|########   | 32/40 [00:06<00:01,  4.82it/s]
     492/499      0.206G     0.02214     0.01085     0.01987          4          320:
82%|########2 | 33/40 [00:06<00:01,  4.92it/s]
     492/499      0.206G     0.02214      0.0108     0.01994          2          320:
82%|########2 | 33/40 [00:06<00:01,  4.92it/s]
     492/499      0.206G     0.02214      0.0108     0.01994          2          320:
85%|########5 | 34/40 [00:06<00:01,  4.92it/s]
     492/499      0.206G     0.02175     0.01065     0.01977          2          320:
85%|########5 | 34/40 [00:06<00:01,  4.92it/s]
     492/499      0.206G     0.02175     0.01065     0.01977          2          320:
88%|########7 | 35/40 [00:06<00:00,  5.03it/s]
     492/499      0.206G     0.02137      0.0105     0.01983          1          320:
88%|########7 | 35/40 [00:06<00:00,  5.03it/s]
     492/499      0.206G     0.02137      0.0105     0.01983          1          320:
90%|######### | 36/40 [00:06<00:00,  4.67it/s]
     492/499      0.206G     0.02107     0.01029     0.02002          1          320:
90%|######### | 36/40 [00:06<00:00,  4.67it/s]
     492/499      0.206G     0.02107     0.01029     0.02002          1          320:
92%|#########2| 37/40 [00:06<00:00,  4.83it/s]
     492/499      0.206G     0.02086      0.0101     0.02004          1          320:
92%|#########2| 37/40 [00:07<00:00,  4.83it/s]
     492/499      0.206G     0.02086      0.0101     0.02004          1          320:
95%|#########5| 38/40 [00:07<00:00,  4.98it/s]
     492/499      0.206G     0.02055    0.009962     0.01994          1          320:
95%|#########5| 38/40 [00:07<00:00,  4.98it/s]
     492/499      0.206G     0.02055    0.009962     0.01994          1          320:
98%|#########7| 39/40 [00:07<00:00,  4.96it/s]
     492/499      0.206G     0.02019    0.009866     0.01979          2          320:
98%|#########7| 39/40 [00:07<00:00,  4.96it/s]
     492/499      0.206G     0.02019    0.009866     0.01979          2          320:
100%|##########| 40/40 [00:07<00:00,  5.05it/s]
     492/499      0.206G     0.02019    0.009866     0.01979          2          320:
100%|##########| 40/40 [00:07<00:00,  5.34it/s]

                 Class      Images  Instances          P          R       mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
                 Class      Images  Instances          P          R       mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:01, 16.00it/s]
                 Class      Images  Instances          P          R       mAP50
```

```
mAP50-95:  20%|##        | 4/20 [00:00<00:01, 14.89it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  30%|###       | 6/20 [00:00<00:00, 16.27it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  40%|####      | 8/20 [00:00<00:00, 15.59it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  50%|#####     | 10/20 [00:00<00:00, 16.18it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 14.84it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  70%|#######   | 14/20 [00:00<00:00, 15.82it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  80%|########  | 16/20 [00:01<00:00, 16.53it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 16.94it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.33it/s]
              Class     Images  Instances         P         R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.35it/s]
                all        40        40      0.98     0.975      0.992
0.802


      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    493/499     0.206G    0.00483   0.002363    0.01437          1       320:
0%|           | 0/40 [00:00<?, ?it/s]
    493/499     0.206G    0.00483   0.002363    0.01437          1       320:
2%|2          | 1/40 [00:00<00:05,  6.60it/s]
    493/499     0.206G   0.007682   0.006017    0.01667          2       320:
2%|2          | 1/40 [00:00<00:05,  6.60it/s]
    493/499     0.206G   0.007682   0.006017    0.01667          2       320:
5%|5          | 2/40 [00:00<00:06,  5.79it/s]
    493/499     0.206G   0.008226    0.00503    0.01473          1       320:
5%|5          | 2/40 [00:00<00:06,  5.79it/s]
    493/499     0.206G   0.008226    0.00503    0.01473          1       320:
8%|7          | 3/40 [00:00<00:06,  5.57it/s]
    493/499     0.206G   0.007685   0.004796    0.01583          1       320:
8%|7          | 3/40 [00:00<00:06,  5.57it/s]
    493/499     0.206G   0.007685   0.004796    0.01583          1       320:
10%|#          | 4/40 [00:00<00:06,  5.27it/s]
    493/499     0.206G   0.007345   0.004318    0.01492          1       320:
10%|#          | 4/40 [00:00<00:06,  5.27it/s]
    493/499     0.206G   0.007345   0.004318    0.01492          1       320:
12%|#2         | 5/40 [00:00<00:06,  5.29it/s]
    493/499     0.206G   0.007708   0.005405    0.01457          4       320:
12%|#2         | 5/40 [00:01<00:06,  5.29it/s]
    493/499     0.206G   0.007708   0.005405    0.01457          4       320:
```

```
15%|#5           | 6/40 [00:01<00:06,  5.14it/s]
     493/499    0.206G   0.008016   0.005115   0.01404        1        320:
15%|#5           | 6/40 [00:01<00:06,  5.14it/s]
     493/499    0.206G   0.008016   0.005115   0.01404        1        320:
18%|#7           | 7/40 [00:01<00:06,  5.34it/s]
     493/499    0.206G   0.009215   0.006116   0.01451        4        320:
18%|#7           | 7/40 [00:01<00:06,  5.34it/s]
     493/499    0.206G   0.009215   0.006116   0.01451        4        320:
20%|##           | 8/40 [00:01<00:06,  5.20it/s]
     493/499    0.206G   0.009578   0.005927   0.01443        2        320:
20%|##           | 8/40 [00:01<00:06,  5.20it/s]
     493/499    0.206G   0.009578   0.005927   0.01443        2        320:
22%|##2          | 9/40 [00:01<00:05,  5.35it/s]
     493/499    0.206G   0.01101    0.006567   0.01487        4        320:
22%|##2          | 9/40 [00:01<00:05,  5.35it/s]
     493/499    0.206G   0.01101    0.006567   0.01487        4        320:
25%|##5          | 10/40 [00:01<00:05,  5.21it/s]
     493/499    0.206G   0.01148    0.007078   0.01488        4        320:
25%|##5          | 10/40 [00:02<00:05,  5.21it/s]
     493/499    0.206G   0.01148    0.007078   0.01488        4        320:
28%|##7          | 11/40 [00:02<00:05,  5.25it/s]
     493/499    0.206G   0.01397    0.00779    0.01607        4        320:
28%|##7          | 11/40 [00:02<00:05,  5.25it/s]
     493/499    0.206G   0.01397    0.00779    0.01607        4        320:
30%|###          | 12/40 [00:02<00:05,  5.39it/s]
     493/499    0.206G   0.01465    0.007862   0.01617        2        320:
30%|###          | 12/40 [00:02<00:05,  5.39it/s]
     493/499    0.206G   0.01465    0.007862   0.01617        2        320:
32%|###2         | 13/40 [00:02<00:05,  5.24it/s]
     493/499    0.206G   0.01603    0.008431   0.01646        4        320:
32%|###2         | 13/40 [00:02<00:05,  5.24it/s]
     493/499    0.206G   0.01603    0.008431   0.01646        4        320:
35%|###5         | 14/40 [00:02<00:05,  5.16it/s]
     493/499    0.206G   0.0154     0.008102   0.01642        1        320:
35%|###5         | 14/40 [00:02<00:05,  5.16it/s]
     493/499    0.206G   0.0154     0.008102   0.01642        1        320:
38%|###7         | 15/40 [00:02<00:04,  5.33it/s]
     493/499    0.206G   0.01548    0.007922   0.01636        1        320:
38%|###7         | 15/40 [00:02<00:04,  5.33it/s]
     493/499    0.206G   0.01548    0.007922   0.01636        1        320:
40%|####         | 16/40 [00:02<00:04,  5.46it/s]
     493/499    0.206G   0.01599    0.008634   0.01678        4        320:
40%|####         | 16/40 [00:03<00:04,  5.46it/s]
     493/499    0.206G   0.01599    0.008634   0.01678        4        320:
42%|####2        | 17/40 [00:03<00:04,  5.53it/s]
     493/499    0.206G   0.01602    0.008561   0.01715        2        320:
42%|####2        | 17/40 [00:03<00:04,  5.53it/s]
     493/499    0.206G   0.01602    0.008561   0.01715        2        320:
```

```
45%|####5       | 18/40 [00:03<00:03,  5.63it/s]
     493/499      0.206G        0.0161    0.008412      0.01738            2           320:
45%|####5       | 18/40 [00:03<00:03,  5.63it/s]
     493/499      0.206G        0.0161    0.008412      0.01738            2           320:
48%|####7       | 19/40 [00:03<00:03,  5.69it/s]
     493/499      0.206G       0.01574     0.00834      0.01754            2           320:
48%|####7       | 19/40 [00:03<00:03,  5.69it/s]
     493/499      0.206G       0.01574     0.00834      0.01754            2           320:
50%|#####       | 20/40 [00:03<00:03,  5.72it/s]
     493/499      0.206G       0.01649    0.008293      0.01733            2           320:
50%|#####       | 20/40 [00:03<00:03,  5.72it/s]
     493/499      0.206G       0.01649    0.008293      0.01733            2           320:
52%|#####2      | 21/40 [00:03<00:03,  5.58it/s]
     493/499      0.206G       0.01655    0.008436      0.01783            3           320:
52%|#####2      | 21/40 [00:04<00:03,  5.58it/s]
     493/499      0.206G       0.01655    0.008436      0.01783            3           320:
55%|#####5      | 22/40 [00:04<00:03,  5.50it/s]
     493/499      0.206G       0.01735     0.00843      0.01818            2           320:
55%|#####5      | 22/40 [00:04<00:03,  5.50it/s]
     493/499      0.206G       0.01735     0.00843      0.01818            2           320:
57%|#####7      | 23/40 [00:04<00:03,  5.35it/s]
     493/499      0.206G       0.01724     0.00845      0.01811            4           320:
57%|#####7      | 23/40 [00:04<00:03,  5.35it/s]
     493/499      0.206G       0.01724     0.00845      0.01811            4           320:
60%|######      | 24/40 [00:04<00:02,  5.57it/s]
     493/499      0.206G       0.01698    0.008397      0.01788            1           320:
60%|######      | 24/40 [00:04<00:02,  5.57it/s]
     493/499      0.206G       0.01698    0.008397      0.01788            1           320:
62%|######2     | 25/40 [00:04<00:02,  5.36it/s]
     493/499      0.206G       0.01896    0.008307       0.0178            2           320:
62%|######2     | 25/40 [00:04<00:02,  5.36it/s]
     493/499      0.206G       0.01896    0.008307       0.0178            2           320:
65%|######5     | 26/40 [00:04<00:02,  5.08it/s]
     493/499      0.206G       0.01851    0.008229      0.01763            2           320:
65%|######5     | 26/40 [00:04<00:02,  5.08it/s]
     493/499      0.206G       0.01851    0.008229      0.01763            2           320:
68%|######7     | 27/40 [00:04<00:02,  5.41it/s]
     493/499      0.206G       0.01939    0.008167      0.01757            2           320:
68%|######7     | 27/40 [00:05<00:02,  5.41it/s]
     493/499      0.206G       0.01939    0.008167      0.01757            2           320:
70%|#######     | 28/40 [00:05<00:02,  5.53it/s]
     493/499      0.206G       0.01982    0.008536      0.01803            4           320:
70%|#######     | 28/40 [00:05<00:02,  5.53it/s]
     493/499      0.206G       0.01982    0.008536      0.01803            4           320:
72%|#######2    | 29/40 [00:05<00:02,  5.47it/s]
     493/499      0.206G       0.01949    0.008332      0.01799            1           320:
72%|#######2    | 29/40 [00:05<00:02,  5.47it/s]
     493/499      0.206G       0.01949    0.008332      0.01799            1           320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.56it/s]
     493/499     0.206G   0.01927   0.008328   0.01821        2       320:
75%|#######5  | 30/40 [00:05<00:01,  5.56it/s]
     493/499     0.206G   0.01927   0.008328   0.01821        2       320:
78%|#######7  | 31/40 [00:05<00:01,  5.64it/s]
     493/499     0.206G    0.0202    0.00829   0.01819        2       320:
78%|#######7  | 31/40 [00:05<00:01,  5.64it/s]
     493/499     0.206G    0.0202    0.00829   0.01819        2       320:
80%|######## | 32/40 [00:05<00:01,  5.66it/s]
     493/499     0.206G   0.02004   0.008365   0.01819        4       320:
80%|######## | 32/40 [00:06<00:01,  5.66it/s]
     493/499     0.206G   0.02004   0.008365   0.01819        4       320:
82%|########2 | 33/40 [00:06<00:01,  5.71it/s]
     493/499     0.206G   0.01974   0.008225   0.01809        1       320:
82%|########2 | 33/40 [00:06<00:01,  5.71it/s]
     493/499     0.206G   0.01974   0.008225   0.01809        1       320:
85%|########5 | 34/40 [00:06<00:01,  5.75it/s]
     493/499     0.206G   0.01978   0.008513   0.01811        4       320:
85%|########5 | 34/40 [00:06<00:01,  5.75it/s]
     493/499     0.206G   0.01978   0.008513   0.01811        4       320:
88%|########7 | 35/40 [00:06<00:00,  5.75it/s]
     493/499     0.206G   0.01951   0.008411   0.01798        1       320:
88%|########7 | 35/40 [00:06<00:00,  5.75it/s]
     493/499     0.206G   0.01951   0.008411   0.01798        1       320:
90%|######### | 36/40 [00:06<00:00,  5.77it/s]
     493/499     0.206G   0.01951   0.008326   0.01787        2       320:
90%|######### | 36/40 [00:06<00:00,  5.77it/s]
     493/499     0.206G   0.01951   0.008326   0.01787        2       320:
92%|#########2| 37/40 [00:06<00:00,  5.63it/s]
     493/499     0.206G   0.01927   0.008194   0.01786        1       320:
92%|#########2| 37/40 [00:06<00:00,  5.63it/s]
     493/499     0.206G   0.01927   0.008194   0.01786        1       320:
95%|#########5| 38/40 [00:06<00:00,  5.67it/s]
     493/499     0.206G   0.01961     0.0082   0.01779        2       320:
95%|#########5| 38/40 [00:07<00:00,  5.67it/s]
     493/499     0.206G   0.01961     0.0082   0.01779        2       320:
98%|#########7| 39/40 [00:07<00:00,  5.71it/s]
     493/499     0.206G   0.02052   0.008187   0.01781        3       320:
98%|#########7| 39/40 [00:07<00:00,  5.71it/s]
     493/499     0.206G   0.02052   0.008187   0.01781        3       320:
100%|##########| 40/40 [00:07<00:00,  5.59it/s]
     493/499     0.206G   0.02052   0.008187   0.01781        3       320:
100%|##########| 40/40 [00:07<00:00,  5.49it/s]


          Class     Images  Instances         P          R       mAP50
mAP50-95:    0%|          | 0/20 [00:00<?, ?it/s]
          Class     Images  Instances         P          R       mAP50
mAP50-95:   10%|#         | 2/20 [00:00<00:01, 15.72it/s]
```

```
               Class     Images  Instances         P           R        mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 17.18it/s]
               Class     Images  Instances         P           R        mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 15.69it/s]
               Class     Images  Instances         P           R        mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 15.07it/s]
               Class     Images  Instances         P           R        mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 16.03it/s]
               Class     Images  Instances         P           R        mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 16.04it/s]
               Class     Images  Instances         P           R        mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 16.71it/s]
               Class     Images  Instances         P           R        mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 16.48it/s]
               Class     Images  Instances         P           R        mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.00it/s]
               Class     Images  Instances         P           R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.78it/s]
               Class     Images  Instances         P           R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.41it/s]
                 all         40         40       0.98       0.975       0.992
0.802

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|           | 0/40 [00:00<?, ?it/s]
    494/499     0.206G    0.02014   0.002578   0.006492          1       320:
0%|           | 0/40 [00:00<?, ?it/s]
    494/499     0.206G    0.02014   0.002578   0.006492          1       320:
2%|2         | 1/40 [00:00<00:06,  6.31it/s]
    494/499     0.206G    0.02821   0.009023    0.01227          3       320:
2%|2         | 1/40 [00:00<00:06,  6.31it/s]
    494/499     0.206G    0.02821   0.009023    0.01227          3       320:
5%|5         | 2/40 [00:00<00:06,  5.98it/s]
    494/499     0.206G    0.02264   0.007818    0.01259          1       320:
5%|5         | 2/40 [00:00<00:06,  5.98it/s]
    494/499     0.206G    0.02264   0.007818    0.01259          1       320:
8%|7         | 3/40 [00:00<00:06,  5.91it/s]
    494/499     0.206G    0.02423    0.00984    0.01629          4       320:
8%|7         | 3/40 [00:00<00:06,  5.91it/s]
    494/499     0.206G    0.02423    0.00984    0.01629          4       320:
10%|#         | 4/40 [00:00<00:06,  5.62it/s]
    494/499     0.206G    0.02136   0.008505    0.01641          1       320:
10%|#         | 4/40 [00:00<00:06,  5.62it/s]
    494/499     0.206G    0.02136   0.008505    0.01641          1       320:
12%|#2        | 5/40 [00:00<00:06,  5.72it/s]
    494/499     0.206G    0.02063   0.009342    0.01728          4       320:
12%|#2        | 5/40 [00:01<00:06,  5.72it/s]
```

```
    494/499      0.206G     0.02063    0.009342      0.01728           4           320:
15%|#5          | 6/40 [00:01<00:06,  5.58it/s]
    494/499      0.206G     0.02043    0.009034       0.0168           2           320:
15%|#5          | 6/40 [00:01<00:06,  5.58it/s]
    494/499      0.206G     0.02043    0.009034       0.0168           2           320:
18%|#7          | 7/40 [00:01<00:05,  5.64it/s]
    494/499      0.206G     0.01934    0.008396      0.01669           1           320:
18%|#7          | 7/40 [00:01<00:05,  5.64it/s]
    494/499      0.206G     0.01934    0.008396      0.01669           1           320:
20%|##          | 8/40 [00:01<00:05,  5.69it/s]
    494/499      0.206G     0.01999    0.008939      0.01729           4           320:
20%|##          | 8/40 [00:01<00:05,  5.69it/s]
    494/499      0.206G     0.01999    0.008939      0.01729           4           320:
22%|##2         | 9/40 [00:01<00:05,  5.73it/s]
    494/499      0.206G     0.01908    0.008839      0.01716           2           320:
22%|##2         | 9/40 [00:01<00:05,  5.73it/s]
    494/499      0.206G     0.01908    0.008839      0.01716           2           320:
25%|##5         | 10/40 [00:01<00:05,  5.76it/s]
    494/499      0.206G      0.0186    0.008887      0.01675           2           320:
25%|##5         | 10/40 [00:01<00:05,  5.76it/s]
    494/499      0.206G      0.0186    0.008887      0.01675           2           320:
28%|##7         | 11/40 [00:01<00:05,  5.76it/s]
    494/499      0.206G     0.01849    0.008804      0.01707           3           320:
28%|##7         | 11/40 [00:02<00:05,  5.76it/s]
    494/499      0.206G     0.01849    0.008804      0.01707           3           320:
30%|###         | 12/40 [00:02<00:05,  5.33it/s]
    494/499      0.206G     0.01867    0.009334      0.01768           4           320:
30%|###         | 12/40 [00:02<00:05,  5.33it/s]
    494/499      0.206G     0.01867    0.009334      0.01768           4           320:
32%|###2        | 13/40 [00:02<00:05,  5.34it/s]
    494/499      0.206G     0.01804    0.009099      0.01732           1           320:
32%|###2        | 13/40 [00:02<00:05,  5.34it/s]
    494/499      0.206G     0.01804    0.009099      0.01732           1           320:
35%|###5        | 14/40 [00:02<00:04,  5.61it/s]
    494/499      0.206G     0.01725     0.00885      0.01735           2           320:
35%|###5        | 14/40 [00:02<00:04,  5.61it/s]
    494/499      0.206G     0.01725     0.00885      0.01735           2           320:
38%|###7        | 15/40 [00:02<00:04,  5.25it/s]
    494/499      0.206G     0.01704    0.008812      0.01722           2           320:
38%|###7        | 15/40 [00:02<00:04,  5.25it/s]
    494/499      0.206G     0.01704    0.008812      0.01722           2           320:
40%|####        | 16/40 [00:02<00:04,  5.26it/s]
    494/499      0.206G     0.01669    0.008743      0.01698           2           320:
40%|####        | 16/40 [00:03<00:04,  5.26it/s]
    494/499      0.206G     0.01669    0.008743      0.01698           2           320:
42%|####2       | 17/40 [00:03<00:04,  5.27it/s]
    494/499      0.206G     0.01654    0.008519      0.01677           1           320:
42%|####2       | 17/40 [00:03<00:04,  5.27it/s]
```

```
    494/499      0.206G    0.01654    0.008519    0.01677          1          320:
45%|####5       | 18/40 [00:03<00:04,  5.17it/s]
    494/499      0.206G    0.01686    0.009189    0.01679          4          320:
45%|####5       | 18/40 [00:03<00:04,  5.17it/s]
    494/499      0.206G    0.01686    0.009189    0.01679          4          320:
48%|####7       | 19/40 [00:03<00:04,  5.08it/s]
    494/499      0.206G    0.01662    0.009244    0.01667          4          320:
48%|####7       | 19/40 [00:03<00:04,  5.08it/s]
    494/499      0.206G    0.01662    0.009244    0.01667          4          320:
50%|#####       | 20/40 [00:03<00:04,  4.81it/s]
    494/499      0.206G    0.01645    0.009248    0.01679          2          320:
50%|#####       | 20/40 [00:03<00:04,  4.81it/s]
    494/499      0.206G    0.01645    0.009248    0.01679          2          320:
52%|#####2      | 21/40 [00:03<00:03,  4.81it/s]
    494/499      0.206G    0.01607    0.009241    0.01682          2          320:
52%|#####2      | 21/40 [00:04<00:03,  4.81it/s]
    494/499      0.206G    0.01607    0.009241    0.01682          2          320:
55%|#####5      | 22/40 [00:04<00:03,  4.84it/s]
    494/499      0.206G    0.01739    0.009236    0.01695          3          320:
55%|#####5      | 22/40 [00:04<00:03,  4.84it/s]
    494/499      0.206G    0.01739    0.009236    0.01695          3          320:
57%|#####7      | 23/40 [00:04<00:03,  4.87it/s]
    494/499      0.206G    0.01777    0.009474    0.01708          4          320:
57%|#####7      | 23/40 [00:04<00:03,  4.87it/s]
    494/499      0.206G    0.01777    0.009474    0.01708          4          320:
60%|######      | 24/40 [00:04<00:03,  4.78it/s]
    494/499      0.206G    0.01746    0.009444    0.01699          2          320:
60%|######      | 24/40 [00:04<00:03,  4.78it/s]
    494/499      0.206G    0.01746    0.009444    0.01699          2          320:
62%|######2     | 25/40 [00:04<00:03,  4.82it/s]
    494/499      0.206G    0.01761    0.009627     0.0173          4          320:
62%|######2     | 25/40 [00:04<00:03,  4.82it/s]
    494/499      0.206G    0.01761    0.009627     0.0173          4          320:
65%|######5     | 26/40 [00:04<00:02,  4.80it/s]
    494/499      0.206G    0.01778    0.009485    0.01729          1          320:
65%|######5     | 26/40 [00:05<00:02,  4.80it/s]
    494/499      0.206G    0.01778    0.009485    0.01729          1          320:
68%|######7     | 27/40 [00:05<00:02,  4.99it/s]
    494/499      0.206G    0.01826    0.009937    0.01736          4          320:
68%|######7     | 27/40 [00:05<00:02,  4.99it/s]
    494/499      0.206G    0.01826    0.009937    0.01736          4          320:
70%|#######     | 28/40 [00:05<00:02,  4.86it/s]
    494/499      0.206G    0.01881    0.009901    0.01743          2          320:
70%|#######     | 28/40 [00:05<00:02,  4.86it/s]
    494/499      0.206G    0.01881    0.009901    0.01743          2          320:
72%|#######2    | 29/40 [00:05<00:02,  4.75it/s]
    494/499      0.206G    0.01862    0.009821    0.01748          2          320:
72%|#######2    | 29/40 [00:05<00:02,  4.75it/s]
```

316

```
    494/499      0.206G     0.01862    0.009821     0.01748         2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.03it/s]
    494/499      0.206G     0.01828    0.009606     0.01726         1        320:
75%|#######5  | 30/40 [00:05<00:01,  5.03it/s]
    494/499      0.206G     0.01828    0.009606     0.01726         1        320:
78%|#######7  | 31/40 [00:05<00:01,  5.24it/s]
    494/499      0.206G     0.01834    0.009753     0.01727         4        320:
78%|#######7  | 31/40 [00:06<00:01,  5.24it/s]
    494/499      0.206G     0.01834    0.009753     0.01727         4        320:
80%|########  | 32/40 [00:06<00:01,  5.38it/s]
    494/499      0.206G     0.01819    0.009696     0.01716         2        320:
80%|########  | 32/40 [00:06<00:01,  5.38it/s]
    494/499      0.206G     0.01819    0.009696     0.01716         2        320:
82%|########2 | 33/40 [00:06<00:01,  5.51it/s]
    494/499      0.206G     0.01815    0.009847     0.01717         4        320:
82%|########2 | 33/40 [00:06<00:01,  5.51it/s]
    494/499      0.206G     0.01815    0.009847     0.01717         4        320:
85%|########5 | 34/40 [00:06<00:01,  5.45it/s]
    494/499      0.206G     0.01845    0.009972     0.01755         2        320:
85%|########5 | 34/40 [00:06<00:01,  5.45it/s]
    494/499      0.206G     0.01845    0.009972     0.01755         2        320:
88%|########7 | 35/40 [00:06<00:00,  5.53it/s]
    494/499      0.206G     0.01845    0.009944     0.01813         2        320:
88%|########7 | 35/40 [00:06<00:00,  5.53it/s]
    494/499      0.206G     0.01845    0.009944     0.01813         2        320:
90%|######### | 36/40 [00:06<00:00,  5.47it/s]
    494/499      0.206G     0.01848     0.01004     0.01805         4        320:
90%|######### | 36/40 [00:06<00:00,  5.47it/s]
    494/499      0.206G     0.01848     0.01004     0.01805         4        320:
92%|#########2| 37/40 [00:06<00:00,  5.57it/s]
    494/499      0.206G     0.01914     0.01005     0.01835         4        320:
92%|#########2| 37/40 [00:07<00:00,  5.57it/s]
    494/499      0.206G     0.01914     0.01005     0.01835         4        320:
95%|#########5| 38/40 [00:07<00:00,  5.36it/s]
    494/499      0.206G     0.01905     0.01008     0.01873         4        320:
95%|#########5| 38/40 [00:07<00:00,  5.36it/s]
    494/499      0.206G     0.01905     0.01008     0.01873         4        320:
98%|#########7| 39/40 [00:07<00:00,  5.35it/s]
    494/499      0.206G     0.01915     0.01014     0.01876         4        320:
98%|#########7| 39/40 [00:07<00:00,  5.35it/s]
    494/499      0.206G     0.01915     0.01014     0.01876         4        320:
100%|##########| 40/40 [00:07<00:00,  5.15it/s]
    494/499      0.206G     0.01915     0.01014     0.01876         4        320:
100%|##########| 40/40 [00:07<00:00,  5.27it/s]


           Class     Images  Instances          P          R      mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
           Class     Images  Instances          P          R      mAP50
```

```
mAP50-95:  10%|#          | 2/20 [00:00<00:01, 16.68it/s]
             Class      Images  Instances         P         R      mAP50
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 17.59it/s]
             Class      Images  Instances         P         R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 17.90it/s]
             Class      Images  Instances         P         R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 18.05it/s]
             Class      Images  Instances         P         R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 17.12it/s]
             Class      Images  Instances         P         R      mAP50
mAP50-95:  65%|######5    | 13/20 [00:00<00:00, 17.96it/s]
             Class      Images  Instances         P         R      mAP50
mAP50-95:  75%|#######5   | 15/20 [00:00<00:00, 18.06it/s]
             Class      Images  Instances         P         R      mAP50
mAP50-95:  85%|########5  | 17/20 [00:00<00:00, 18.13it/s]
             Class      Images  Instances         P         R      mAP50
mAP50-95:  95%|#########5 | 19/20 [00:01<00:00, 17.95it/s]
             Class      Images  Instances         P         R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.78it/s]
                all        40         40      0.98     0.975       0.99
0.803

      Epoch   GPU_mem   box_loss   obj_loss   cls_loss  Instances      Size

  0%|          | 0/40 [00:00<?, ?it/s]
    495/499    0.206G    0.02386   0.009463    0.02391          1       320:
0%|          | 0/40 [00:00<?, ?it/s]
    495/499    0.206G    0.02386   0.009463    0.02391          1       320:
2%|2         | 1/40 [00:00<00:06,  5.76it/s]
    495/499    0.206G    0.02002   0.007271    0.02013          1       320:
2%|2         | 1/40 [00:00<00:06,  5.76it/s]
    495/499    0.206G    0.02002   0.007271    0.02013          1       320:
5%|5         | 2/40 [00:00<00:06,  5.80it/s]
    495/499    0.206G    0.02021   0.009461    0.01858          1       320:
5%|5         | 2/40 [00:00<00:06,  5.80it/s]
    495/499    0.206G    0.02021   0.009461    0.01858          1       320:
8%|7         | 3/40 [00:00<00:06,  6.05it/s]
    495/499    0.206G    0.01854    0.00978    0.01773          4       320:
8%|7         | 3/40 [00:00<00:06,  6.05it/s]
    495/499    0.206G    0.01854    0.00978    0.01773          4       320:
10%|#         | 4/40 [00:00<00:06,  5.96it/s]
    495/499    0.206G    0.01738   0.009818    0.01763          2       320:
10%|#         | 4/40 [00:00<00:06,  5.96it/s]
    495/499    0.206G    0.01738   0.009818    0.01763          2       320:
12%|#2        | 5/40 [00:00<00:05,  5.91it/s]
    495/499    0.206G    0.01631    0.01051    0.01708          4       320:
12%|#2        | 5/40 [00:01<00:05,  5.91it/s]
    495/499    0.206G    0.01631    0.01051    0.01708          4       320:
```

```
15%|#5           | 6/40 [00:01<00:05,  5.69it/s]
     495/499     0.206G     0.02151     0.01011     0.01713          2          320:
15%|#5           | 6/40 [00:01<00:05,  5.69it/s]
     495/499     0.206G     0.02151     0.01011     0.01713          2          320:
18%|#7           | 7/40 [00:01<00:05,  5.71it/s]
     495/499     0.206G     0.02062     0.009521    0.01695          2          320:
18%|#7           | 7/40 [00:01<00:05,  5.71it/s]
     495/499     0.206G     0.02062     0.009521    0.01695          2          320:
20%|##           | 8/40 [00:01<00:05,  5.75it/s]
     495/499     0.206G     0.02153     0.01034     0.0184           4          320:
20%|##           | 8/40 [00:01<00:05,  5.75it/s]
     495/499     0.206G     0.02153     0.01034     0.0184           4          320:
22%|##2          | 9/40 [00:01<00:05,  5.61it/s]
     495/499     0.206G     0.02092     0.009874    0.01806          2          320:
22%|##2          | 9/40 [00:01<00:05,  5.61it/s]
     495/499     0.206G     0.02092     0.009874    0.01806          2          320:
25%|##5          | 10/40 [00:01<00:05,  5.65it/s]
     495/499     0.206G     0.0201      0.009283    0.01804          1          320:
25%|##5          | 10/40 [00:01<00:05,  5.65it/s]
     495/499     0.206G     0.0201      0.009283    0.01804          1          320:
28%|##7          | 11/40 [00:01<00:04,  5.86it/s]
     495/499     0.206G     0.01903     0.008814    0.01765          1          320:
28%|##7          | 11/40 [00:02<00:04,  5.86it/s]
     495/499     0.206G     0.01903     0.008814    0.01765          1          320:
30%|###          | 12/40 [00:02<00:04,  5.69it/s]
     495/499     0.206G     0.02092     0.009119    0.01817          4          320:
30%|###          | 12/40 [00:02<00:04,  5.69it/s]
     495/499     0.206G     0.02092     0.009119    0.01817          4          320:
32%|###2         | 13/40 [00:02<00:04,  5.41it/s]
     495/499     0.206G     0.02284     0.008905    0.01888          2          320:
32%|###2         | 13/40 [00:02<00:04,  5.41it/s]
     495/499     0.206G     0.02284     0.008905    0.01888          2          320:
35%|###5         | 14/40 [00:02<00:04,  5.39it/s]
     495/499     0.206G     0.0221      0.008743    0.01851          2          320:
35%|###5         | 14/40 [00:02<00:04,  5.39it/s]
     495/499     0.206G     0.0221      0.008743    0.01851          2          320:
38%|###7         | 15/40 [00:02<00:04,  5.66it/s]
     495/499     0.206G     0.0211      0.008387    0.01836          1          320:
38%|###7         | 15/40 [00:02<00:04,  5.66it/s]
     495/499     0.206G     0.0211      0.008387    0.01836          1          320:
40%|####         | 16/40 [00:02<00:04,  5.54it/s]
     495/499     0.206G     0.02048     0.008236    0.01816          2          320:
40%|####         | 16/40 [00:03<00:04,  5.54it/s]
     495/499     0.206G     0.02048     0.008236    0.01816          2          320:
42%|####2        | 17/40 [00:03<00:04,  5.47it/s]
     495/499     0.206G     0.02005     0.008074    0.01794          1          320:
42%|####2        | 17/40 [00:03<00:04,  5.47it/s]
     495/499     0.206G     0.02005     0.008074    0.01794          1          320:
```

```
45%|####5        | 18/40 [00:03<00:04,  5.43it/s]
     495/499     0.206G    0.01953   0.007971    0.01764         1        320:
45%|####5        | 18/40 [00:03<00:04,  5.43it/s]
     495/499     0.206G    0.01953   0.007971    0.01764         1        320:
48%|####7        | 19/40 [00:03<00:03,  5.54it/s]
     495/499     0.206G    0.02008   0.008355    0.01793         4        320:
48%|####7        | 19/40 [00:03<00:03,  5.54it/s]
     495/499     0.206G    0.02008   0.008355    0.01793         4        320:
50%|#####        | 20/40 [00:03<00:03,  5.62it/s]
     495/499     0.206G    0.01952   0.008104    0.01787         1        320:
50%|#####        | 20/40 [00:03<00:03,  5.62it/s]
     495/499     0.206G    0.01952   0.008104    0.01787         1        320:
52%|#####2       | 21/40 [00:03<00:03,  5.49it/s]
     495/499     0.206G    0.01899   0.007843    0.01765         1        320:
52%|#####2       | 21/40 [00:03<00:03,  5.49it/s]
     495/499     0.206G    0.01899   0.007843    0.01765         1        320:
55%|#####5       | 22/40 [00:03<00:03,  5.76it/s]
     495/499     0.206G    0.01947   0.008345    0.01817         4        320:
55%|#####5       | 22/40 [00:04<00:03,  5.76it/s]
     495/499     0.206G    0.01947   0.008345    0.01817         4        320:
57%|#####7       | 23/40 [00:04<00:03,  5.62it/s]
     495/499     0.206G    0.01914   0.008255    0.01816         2        320:
57%|#####7       | 23/40 [00:04<00:03,  5.62it/s]
     495/499     0.206G    0.01914   0.008255    0.01816         2        320:
60%|######       | 24/40 [00:04<00:02,  5.84it/s]
     495/499     0.206G    0.01883   0.008166    0.01783         1        320:
60%|######       | 24/40 [00:04<00:02,  5.84it/s]
     495/499     0.206G    0.01883   0.008166    0.01783         1        320:
62%|######2      | 25/40 [00:04<00:02,  5.80it/s]
     495/499     0.206G    0.01954   0.008097    0.01775         2        320:
62%|######2      | 25/40 [00:04<00:02,  5.80it/s]
     495/499     0.206G    0.01954   0.008097    0.01775         2        320:
65%|######5      | 26/40 [00:04<00:02,  5.81it/s]
     495/499     0.206G    0.01932   0.008241     0.0182         4        320:
65%|######5      | 26/40 [00:04<00:02,  5.81it/s]
     495/499     0.206G    0.01932   0.008241     0.0182         4        320:
68%|######7      | 27/40 [00:04<00:02,  5.81it/s]
     495/499     0.206G    0.01945   0.008183    0.01871         2        320:
68%|######7      | 27/40 [00:04<00:02,  5.81it/s]
     495/499     0.206G    0.01945   0.008183    0.01871         2        320:
70%|#######      | 28/40 [00:04<00:02,  5.64it/s]
     495/499     0.206G     0.0205   0.008262    0.01861         2        320:
70%|#######      | 28/40 [00:05<00:02,  5.64it/s]
     495/499     0.206G     0.0205   0.008262    0.01861         2        320:
72%|#######2     | 29/40 [00:05<00:01,  5.54it/s]
     495/499     0.206G     0.0203   0.008371    0.01886         3        320:
72%|#######2     | 29/40 [00:05<00:01,  5.54it/s]
     495/499     0.206G     0.0203   0.008371    0.01886         3        320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.62it/s]
     495/499    0.206G     0.0206   0.008405    0.01883        2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.62it/s]
     495/499    0.206G     0.0206   0.008405    0.01883        2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.51it/s]
     495/499    0.206G    0.02074   0.008751    0.01888        4        320:
78%|#######7  | 31/40 [00:05<00:01,  5.51it/s]
     495/499    0.206G    0.02074   0.008751    0.01888        4        320:
80%|########  | 32/40 [00:05<00:01,  5.32it/s]
     495/499    0.206G    0.02039   0.008674    0.01903        2        320:
80%|########  | 32/40 [00:05<00:01,  5.32it/s]
     495/499    0.206G    0.02039   0.008674    0.01903        2        320:
82%|########2 | 33/40 [00:05<00:01,  5.46it/s]
     495/499    0.206G    0.02096   0.008889    0.01905        4        320:
82%|########2 | 33/40 [00:06<00:01,  5.46it/s]
     495/499    0.206G    0.02096   0.008889    0.01905        4        320:
85%|########5 | 34/40 [00:06<00:01,  5.43it/s]
     495/499    0.206G    0.02075   0.008897    0.01896        2        320:
85%|########5 | 34/40 [00:06<00:01,  5.43it/s]
     495/499    0.206G    0.02075   0.008897    0.01896        2        320:
88%|########7 | 35/40 [00:06<00:00,  5.54it/s]
     495/499    0.206G    0.02048   0.008717    0.01877        1        320:
88%|########7 | 35/40 [00:06<00:00,  5.54it/s]
     495/499    0.206G    0.02048   0.008717    0.01877        1        320:
90%|######### | 36/40 [00:06<00:00,  5.62it/s]
     495/499    0.206G    0.02026   0.008621    0.01867        1        320:
90%|######### | 36/40 [00:06<00:00,  5.62it/s]
     495/499    0.206G    0.02026   0.008621    0.01867        1        320:
92%|#########2| 37/40 [00:06<00:00,  5.51it/s]
     495/499    0.206G    0.02051   0.008575    0.01877        1        320:
92%|#########2| 37/40 [00:06<00:00,  5.51it/s]
     495/499    0.206G    0.02051   0.008575    0.01877        1        320:
95%|#########5| 38/40 [00:06<00:00,  5.60it/s]
     495/499    0.206G    0.02033   0.008525    0.01865        2        320:
95%|#########5| 38/40 [00:06<00:00,  5.60it/s]
     495/499    0.206G    0.02033   0.008525    0.01865        2        320:
98%|#########7| 39/40 [00:06<00:00,  5.52it/s]
     495/499    0.206G    0.02025   0.008457    0.01851        1        320:
98%|#########7| 39/40 [00:07<00:00,  5.52it/s]
     495/499    0.206G    0.02025   0.008457    0.01851        1        320:
100%|##########| 40/40 [00:07<00:00,  5.58it/s]
     495/499    0.206G    0.02025   0.008457    0.01851        1        320:
100%|##########| 40/40 [00:07<00:00,  5.62it/s]


          Class     Images  Instances          P         R      mAP50
mAP50-95:   0%|              | 0/20 [00:00<?, ?it/s]
          Class     Images  Instances          P         R      mAP50
mAP50-95:  10%|#             | 2/20 [00:00<00:00, 18.28it/s]
```

```
               Class     Images  Instances           P           R       mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:00, 18.29it/s]
               Class     Images  Instances           P           R       mAP50
mAP50-95:  35%|###5        | 7/20 [00:00<00:00, 17.66it/s]
               Class     Images  Instances           P           R       mAP50
mAP50-95:  45%|####5       | 9/20 [00:00<00:00, 17.11it/s]
               Class     Images  Instances           P           R       mAP50
mAP50-95:  55%|#####5      | 11/20 [00:00<00:00, 16.73it/s]
               Class     Images  Instances           P           R       mAP50
mAP50-95:  65%|######5     | 13/20 [00:00<00:00, 16.48it/s]
               Class     Images  Instances           P           R       mAP50
mAP50-95:  75%|#######5    | 15/20 [00:00<00:00, 15.67it/s]
               Class     Images  Instances           P           R       mAP50
mAP50-95:  85%|########5 | 17/20 [00:01<00:00, 15.72it/s]
               Class     Images  Instances           P           R       mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 16.43it/s]
               Class     Images  Instances           P           R       mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.36it/s]
                 all        40         40        0.98       0.975        0.99
0.803

       Epoch    GPU_mem    box_loss    obj_loss    cls_loss   Instances        Size

  0%|            | 0/40 [00:00<?, ?it/s]
     496/499     0.206G     0.01144    0.006414     0.01317           2        320:
0%|            | 0/40 [00:00<?, ?it/s]
     496/499     0.206G     0.01144    0.006414     0.01317           2        320:
2%|2          | 1/40 [00:00<00:06,  6.40it/s]
     496/499     0.206G     0.01834    0.009769     0.01599           4        320:
2%|2          | 1/40 [00:00<00:06,  6.40it/s]
     496/499     0.206G     0.01834    0.009769     0.01599           4        320:
5%|5          | 2/40 [00:00<00:07,  5.43it/s]
     496/499     0.206G     0.03032    0.009373     0.01713           3        320:
5%|5          | 2/40 [00:00<00:07,  5.43it/s]
     496/499     0.206G     0.03032    0.009373     0.01713           3        320:
8%|7          | 3/40 [00:00<00:06,  5.60it/s]
     496/499     0.206G     0.02565    0.008559     0.01663           2        320:
8%|7          | 3/40 [00:00<00:06,  5.60it/s]
     496/499     0.206G     0.02565    0.008559     0.01663           2        320:
10%|#          | 4/40 [00:00<00:06,  5.31it/s]
     496/499     0.206G     0.02273     0.00773     0.01611           1        320:
10%|#          | 4/40 [00:00<00:06,  5.31it/s]
     496/499     0.206G     0.02273     0.00773     0.01611           1        320:
12%|#2         | 5/40 [00:00<00:06,  5.30it/s]
     496/499     0.206G     0.02049    0.006998     0.01552           1        320:
12%|#2         | 5/40 [00:01<00:06,  5.30it/s]
     496/499     0.206G     0.02049    0.006998     0.01552           1        320:
15%|#5         | 6/40 [00:01<00:06,  5.16it/s]
```

```
       496/499        0.206G       0.01906      0.006402        0.01508              1          320:
15%|#5          | 6/40 [00:01<00:06,  5.16it/s]
       496/499        0.206G       0.01906      0.006402        0.01508              1          320:
18%|#7          | 7/40 [00:01<00:06,  5.08it/s]
       496/499        0.206G       0.01999       0.00745        0.01563              3          320:
18%|#7          | 7/40 [00:01<00:06,  5.08it/s]
       496/499        0.206G       0.01999       0.00745        0.01563              3          320:
20%|##          | 8/40 [00:01<00:06,  5.01it/s]
       496/499        0.206G       0.02136      0.008391        0.01665              4          320:
20%|##          | 8/40 [00:01<00:06,  5.01it/s]
       496/499        0.206G       0.02136      0.008391        0.01665              4          320:
22%|##2         | 9/40 [00:01<00:06,  4.99it/s]
       496/499        0.206G       0.02205      0.008166        0.01652              2          320:
22%|##2         | 9/40 [00:01<00:06,  4.99it/s]
       496/499        0.206G       0.02205      0.008166        0.01652              2          320:
25%|##5         | 10/40 [00:01<00:06,  4.84it/s]
       496/499        0.206G       0.02145      0.008274        0.01639              2          320:
25%|##5         | 10/40 [00:02<00:06,  4.84it/s]
       496/499        0.206G       0.02145      0.008274        0.01639              2          320:
28%|##7         | 11/40 [00:02<00:05,  4.86it/s]
       496/499        0.206G       0.02221      0.008983        0.01728              4          320:
28%|##7         | 11/40 [00:02<00:05,  4.86it/s]
       496/499        0.206G       0.02221      0.008983        0.01728              4          320:
30%|###         | 12/40 [00:02<00:05,  4.88it/s]
       496/499        0.206G       0.02183      0.008739        0.01725              2          320:
30%|###         | 12/40 [00:02<00:05,  4.88it/s]
       496/499        0.206G       0.02183      0.008739        0.01725              2          320:
32%|###2        | 13/40 [00:02<00:05,  4.89it/s]
       496/499        0.206G       0.02179      0.008652        0.01705              2          320:
32%|###2        | 13/40 [00:02<00:05,  4.89it/s]
       496/499        0.206G       0.02179      0.008652        0.01705              2          320:
35%|###5        | 14/40 [00:02<00:05,  5.02it/s]
       496/499        0.206G       0.02138        0.0084         0.0169              1          320:
35%|###5        | 14/40 [00:02<00:05,  5.02it/s]
       496/499        0.206G       0.02138        0.0084         0.0169              1          320:
38%|###7        | 15/40 [00:02<00:04,  5.11it/s]
       496/499        0.206G       0.02093       0.00848        0.01903              2          320:
38%|###7        | 15/40 [00:03<00:04,  5.11it/s]
       496/499        0.206G       0.02093       0.00848        0.01903              2          320:
40%|####        | 16/40 [00:03<00:05,  4.70it/s]
       496/499        0.206G        0.0209      0.008651        0.01926              4          320:
40%|####        | 16/40 [00:03<00:05,  4.70it/s]
       496/499        0.206G        0.0209      0.008651        0.01926              4          320:
42%|####2       | 17/40 [00:03<00:04,  4.76it/s]
       496/499        0.206G       0.02149      0.008541        0.01952              2          320:
42%|####2       | 17/40 [00:03<00:04,  4.76it/s]
       496/499        0.206G       0.02149      0.008541        0.01952              2          320:
45%|####5       | 18/40 [00:03<00:04,  4.79it/s]
```

```
     496/499      0.206G     0.02102    0.008371      0.01966          2          320:
45%|####5     | 18/40 [00:03<00:04,  4.79it/s]
     496/499      0.206G     0.02102    0.008371      0.01966          2          320:
48%|####7     | 19/40 [00:03<00:04,  4.94it/s]
     496/499      0.206G     0.02142    0.008674      0.01983          4          320:
48%|####7     | 19/40 [00:03<00:04,  4.94it/s]
     496/499      0.206G     0.02142    0.008674      0.01983          4          320:
50%|#####     | 20/40 [00:03<00:03,  5.05it/s]
     496/499      0.206G     0.02143    0.008992       0.0197          4          320:
50%|#####     | 20/40 [00:04<00:03,  5.05it/s]
     496/499      0.206G     0.02143    0.008992       0.0197          4          320:
52%|#####2    | 21/40 [00:04<00:03,  5.25it/s]
     496/499      0.206G     0.02135    0.008874      0.01952          1          320:
52%|#####2    | 21/40 [00:04<00:03,  5.25it/s]
     496/499      0.206G     0.02135    0.008874      0.01952          1          320:
55%|#####5    | 22/40 [00:04<00:03,  5.41it/s]
     496/499      0.206G     0.02085    0.008898      0.01956          4          320:
55%|#####5    | 22/40 [00:04<00:03,  5.41it/s]
     496/499      0.206G     0.02085    0.008898      0.01956          4          320:
57%|#####7    | 23/40 [00:04<00:03,  5.38it/s]
     496/499      0.206G     0.02186    0.008951      0.02051          3          320:
57%|#####7    | 23/40 [00:04<00:03,  5.38it/s]
     496/499      0.206G     0.02186    0.008951      0.02051          3          320:
60%|######    | 24/40 [00:04<00:02,  5.47it/s]
     496/499      0.206G      0.0216    0.009008      0.02033          2          320:
60%|######    | 24/40 [00:04<00:02,  5.47it/s]
     496/499      0.206G      0.0216    0.009008      0.02033          2          320:
62%|######2   | 25/40 [00:04<00:02,  5.58it/s]
     496/499      0.206G     0.02141    0.009172      0.02016          4          320:
62%|######2   | 25/40 [00:05<00:02,  5.58it/s]
     496/499      0.206G     0.02141    0.009172      0.02016          4          320:
65%|######5   | 26/40 [00:05<00:02,  5.50it/s]
     496/499      0.206G     0.02103    0.009055      0.02011          2          320:
65%|######5   | 26/40 [00:05<00:02,  5.50it/s]
     496/499      0.206G     0.02103    0.009055      0.02011          2          320:
68%|######7   | 27/40 [00:05<00:02,  5.60it/s]
     496/499      0.206G     0.02072    0.009308      0.01984          4          320:
68%|######7   | 27/40 [00:05<00:02,  5.60it/s]
     496/499      0.206G     0.02072    0.009308      0.01984          4          320:
70%|#######   | 28/40 [00:05<00:02,  5.66it/s]
     496/499      0.206G     0.02035    0.009166      0.01958          2          320:
70%|#######   | 28/40 [00:05<00:02,  5.66it/s]
     496/499      0.206G     0.02035    0.009166      0.01958          2          320:
72%|#######2  | 29/40 [00:05<00:01,  5.71it/s]
     496/499      0.206G     0.02156    0.009117      0.01968          3          320:
72%|#######2  | 29/40 [00:05<00:01,  5.71it/s]
     496/499      0.206G     0.02156    0.009117      0.01968          3          320:
75%|#######5  | 30/40 [00:05<00:01,  5.57it/s]
```

```
    496/499       0.206G     0.02159    0.009235      0.01983           4           320:
75%|#######5  | 30/40 [00:05<00:01,  5.57it/s]
    496/499       0.206G     0.02159    0.009235      0.01983           4           320:
78%|#######7  | 31/40 [00:05<00:01,  5.50it/s]
    496/499       0.206G     0.02216     0.00917      0.01979           2           320:
78%|#######7  | 31/40 [00:06<00:01,  5.50it/s]
    496/499       0.206G     0.02216     0.00917      0.01979           2           320:
80%|########  | 32/40 [00:06<00:01,  5.59it/s]
    496/499       0.206G     0.02232    0.009113      0.01969           2           320:
80%|########  | 32/40 [00:06<00:01,  5.59it/s]
    496/499       0.206G     0.02232    0.009113      0.01969           2           320:
82%|########2 | 33/40 [00:06<00:01,  5.34it/s]
    496/499       0.206G     0.02191    0.008941      0.01948           1           320:
82%|########2 | 33/40 [00:06<00:01,  5.34it/s]
    496/499       0.206G     0.02191    0.008941      0.01948           1           320:
85%|########5 | 34/40 [00:06<00:01,  5.34it/s]
    496/499       0.206G     0.02168    0.008864      0.01943           2           320:
85%|########5 | 34/40 [00:06<00:01,  5.34it/s]
    496/499       0.206G     0.02168    0.008864      0.01943           2           320:
88%|########7 | 35/40 [00:06<00:00,  5.16it/s]
    496/499       0.206G     0.02128    0.008787      0.01926           2           320:
88%|########7 | 35/40 [00:06<00:00,  5.16it/s]
    496/499       0.206G     0.02128    0.008787      0.01926           2           320:
90%|######### | 36/40 [00:06<00:00,  5.52it/s]
    496/499       0.206G      0.0214    0.008686      0.01928           1           320:
90%|######### | 36/40 [00:07<00:00,  5.52it/s]
    496/499       0.206G      0.0214    0.008686      0.01928           1           320:
92%|#########2| 37/40 [00:07<00:00,  5.46it/s]
    496/499       0.206G     0.02156    0.008728      0.01946           3           320:
92%|#########2| 37/40 [00:07<00:00,  5.46it/s]
    496/499       0.206G     0.02156    0.008728      0.01946           3           320:
95%|#########5| 38/40 [00:07<00:00,  5.27it/s]
    496/499       0.206G     0.02129    0.008576      0.01928           1           320:
95%|#########5| 38/40 [00:07<00:00,  5.27it/s]
    496/499       0.206G     0.02129    0.008576      0.01928           1           320:
98%|#########7| 39/40 [00:07<00:00,  5.42it/s]
    496/499       0.206G     0.02123    0.008752      0.01943           4           320:
98%|#########7| 39/40 [00:07<00:00,  5.42it/s]
    496/499       0.206G     0.02123    0.008752      0.01943           4           320:
100%|##########| 40/40 [00:07<00:00,  5.54it/s]
    496/499       0.206G     0.02123    0.008752      0.01943           4           320:
100%|##########| 40/40 [00:07<00:00,  5.26it/s]


              Class       Images  Instances           P           R      mAP50
mAP50-95:    0%|            | 0/20 [00:00<?, ?it/s]
              Class       Images  Instances           P           R      mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:01, 16.00it/s]
              Class       Images  Instances           P           R      mAP50
```

```
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 17.28it/s]
              Class       Images  Instances          P            R         mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 17.72it/s]
              Class       Images  Instances          P            R         mAP50
mAP50-95:  45%|####5      | 9/20 [00:00<00:00, 18.43it/s]
              Class       Images  Instances          P            R         mAP50
mAP50-95:  55%|#####5     | 11/20 [00:00<00:00, 18.38it/s]
              Class       Images  Instances          P            R         mAP50
mAP50-95:  65%|######5    | 13/20 [00:00<00:00, 17.47it/s]
              Class       Images  Instances          P            R         mAP50
mAP50-95:  75%|#######5   | 15/20 [00:00<00:00, 17.71it/s]
              Class       Images  Instances          P            R         mAP50
mAP50-95:  85%|########5  | 17/20 [00:00<00:00, 17.88it/s]
              Class       Images  Instances          P            R         mAP50
mAP50-95:  95%|#########5| 19/20 [00:01<00:00, 18.00it/s]
              Class       Images  Instances          P            R         mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.99it/s]
                all           40          40        0.982        0.973        0.992
0.811

        Epoch    GPU_mem    box_loss    obj_loss    cls_loss   Instances        Size

   0%|            | 0/40 [00:00<?, ?it/s]
      497/499     0.206G     0.03782    0.006603     0.02479           2        320:
0%|            | 0/40 [00:00<?, ?it/s]
      497/499     0.206G     0.03782    0.006603     0.02479           2        320:
2%|2          | 1/40 [00:00<00:06,  5.82it/s]
      497/499     0.206G     0.02259    0.004931     0.02222           1        320:
2%|2          | 1/40 [00:00<00:06,  5.82it/s]
      497/499     0.206G     0.02259    0.004931     0.02222           1        320:
5%|5          | 2/40 [00:00<00:06,  6.10it/s]
      497/499     0.206G     0.01851    0.004743     0.02423           1        320:
5%|5          | 2/40 [00:00<00:06,  6.10it/s]
      497/499     0.206G     0.01851    0.004743     0.02423           1        320:
8%|7          | 3/40 [00:00<00:06,  5.97it/s]
      497/499     0.206G     0.01942    0.006174     0.02276           2        320:
8%|7          | 3/40 [00:00<00:06,  5.97it/s]
      497/499     0.206G     0.01942    0.006174     0.02276           2        320:
10%|#          | 4/40 [00:00<00:06,  5.91it/s]
      497/499     0.206G     0.02449    0.006284     0.02169           2        320:
10%|#          | 4/40 [00:00<00:06,  5.91it/s]
      497/499     0.206G     0.02449    0.006284     0.02169           2        320:
12%|#2         | 5/40 [00:00<00:06,  5.61it/s]
      497/499     0.206G     0.02702    0.006661     0.02061           2        320:
12%|#2         | 5/40 [00:01<00:06,  5.61it/s]
      497/499     0.206G     0.02702    0.006661     0.02061           2        320:
15%|#5         | 6/40 [00:01<00:05,  5.73it/s]
      497/499     0.206G     0.03151    0.006473     0.02004           2        320:
```

```
15%|#5          | 6/40 [00:01<00:05,  5.73it/s]
    497/499     0.206G     0.03151    0.006473    0.02004       2        320:
18%|#7          | 7/40 [00:01<00:05,  5.59it/s]
    497/499     0.206G     0.02872    0.006893    0.01986       4        320:
18%|#7          | 7/40 [00:01<00:05,  5.59it/s]
    497/499     0.206G     0.02872    0.006893    0.01986       4        320:
20%|##          | 8/40 [00:01<00:05,  5.50it/s]
    497/499     0.206G     0.02727    0.007445    0.01991       4        320:
20%|##          | 8/40 [00:01<00:05,  5.50it/s]
    497/499     0.206G     0.02727    0.007445    0.01991       4        320:
22%|##2         | 9/40 [00:01<00:05,  5.30it/s]
    497/499     0.206G     0.02642    0.007492     0.0196       2        320:
22%|##2         | 9/40 [00:01<00:05,  5.30it/s]
    497/499     0.206G     0.02642    0.007492     0.0196       2        320:
25%|##5         | 10/40 [00:01<00:05,  5.45it/s]
    497/499     0.206G     0.02504    0.007127    0.01903       1        320:
25%|##5         | 10/40 [00:01<00:05,  5.45it/s]
    497/499     0.206G     0.02504    0.007127    0.01903       1        320:
28%|##7         | 11/40 [00:01<00:05,  5.54it/s]
    497/499     0.206G     0.02506    0.007387    0.01938       4        320:
28%|##7         | 11/40 [00:02<00:05,  5.54it/s]
    497/499     0.206G     0.02506    0.007387    0.01938       4        320:
30%|###         | 12/40 [00:02<00:05,  5.58it/s]
    497/499     0.206G     0.02393    0.007311    0.01918       1        320:
30%|###         | 12/40 [00:02<00:05,  5.58it/s]
    497/499     0.206G     0.02393    0.007311    0.01918       1        320:
32%|###2        | 13/40 [00:02<00:04,  5.54it/s]
    497/499     0.206G     0.02676    0.00719     0.01906       2        320:
32%|###2        | 13/40 [00:02<00:04,  5.54it/s]
    497/499     0.206G     0.02676    0.00719     0.01906       2        320:
35%|###5        | 14/40 [00:02<00:04,  5.47it/s]
    497/499     0.206G     0.02565    0.006913    0.01888       1        320:
35%|###5        | 14/40 [00:02<00:04,  5.47it/s]
    497/499     0.206G     0.02565    0.006913    0.01888       1        320:
38%|###7        | 15/40 [00:02<00:04,  5.57it/s]
    497/499     0.206G     0.02728    0.007141    0.01883       3        320:
38%|###7        | 15/40 [00:02<00:04,  5.57it/s]
    497/499     0.206G     0.02728    0.007141    0.01883       3        320:
40%|####        | 16/40 [00:02<00:04,  5.50it/s]
    497/499     0.206G     0.02661    0.007779     0.0186       4        320:
40%|####        | 16/40 [00:03<00:04,  5.50it/s]
    497/499     0.206G     0.02661    0.007779     0.0186       4        320:
42%|####2       | 17/40 [00:03<00:04,  5.29it/s]
    497/499     0.206G     0.02588    0.007629    0.01841       1        320:
42%|####2       | 17/40 [00:03<00:04,  5.29it/s]
    497/499     0.206G     0.02588    0.007629    0.01841       1        320:
45%|####5       | 18/40 [00:03<00:04,  5.30it/s]
    497/499     0.206G     0.02699    0.007825    0.01829       2        320:
```

```
45%|####5       | 18/40 [00:03<00:04,  5.30it/s]
    497/499      0.206G      0.02699     0.007825    0.01829          2         320:
48%|####7       | 19/40 [00:03<00:03,  5.30it/s]
    497/499      0.206G      0.02613     0.007801    0.01801          2         320:
48%|####7       | 19/40 [00:03<00:03,  5.30it/s]
    497/499      0.206G      0.02613     0.007801    0.01801          2         320:
50%|#####       | 20/40 [00:03<00:03,  5.57it/s]
    497/499      0.206G      0.02592     0.007824    0.01897          2         320:
50%|#####       | 20/40 [00:03<00:03,  5.57it/s]
    497/499      0.206G      0.02592     0.007824    0.01897          2         320:
52%|#####2      | 21/40 [00:03<00:03,  5.50it/s]
    497/499      0.206G      0.02652     0.008078    0.01913          4         320:
52%|#####2      | 21/40 [00:03<00:03,  5.50it/s]
    497/499      0.206G      0.02652     0.008078    0.01913          4         320:
55%|#####5      | 22/40 [00:03<00:03,  5.36it/s]
    497/499      0.206G      0.02613     0.008441    0.01904          4         320:
55%|#####5      | 22/40 [00:04<00:03,  5.36it/s]
    497/499      0.206G      0.02613     0.008441    0.01904          4         320:
57%|#####7      | 23/40 [00:04<00:03,  5.44it/s]
    497/499      0.206G      0.02633     0.008347    0.01994          2         320:
57%|#####7      | 23/40 [00:04<00:03,  5.44it/s]
    497/499      0.206G      0.02633     0.008347    0.01994          2         320:
60%|######      | 24/40 [00:04<00:02,  5.41it/s]
    497/499      0.206G       0.0267     0.008442    0.02009          4         320:
60%|######      | 24/40 [00:04<00:02,  5.41it/s]
    497/499      0.206G       0.0267     0.008442    0.02009          4         320:
62%|######2     | 25/40 [00:04<00:02,  5.40it/s]
    497/499      0.206G      0.02682      0.00844     0.0203          2         320:
62%|######2     | 25/40 [00:04<00:02,  5.40it/s]
    497/499      0.206G      0.02682      0.00844     0.0203          2         320:
65%|######5     | 26/40 [00:04<00:02,  5.35it/s]
    497/499      0.206G      0.02707     0.008596    0.02046          3         320:
65%|######5     | 26/40 [00:04<00:02,  5.35it/s]
    497/499      0.206G      0.02707     0.008596    0.02046          3         320:
68%|######7     | 27/40 [00:04<00:02,  5.35it/s]
    497/499      0.206G      0.02642     0.008397    0.02022          1         320:
68%|######7     | 27/40 [00:05<00:02,  5.35it/s]
    497/499      0.206G      0.02642     0.008397    0.02022          1         320:
70%|#######     | 28/40 [00:05<00:02,  5.19it/s]
    497/499      0.206G      0.02624     0.008781    0.02015          4         320:
70%|#######     | 28/40 [00:05<00:02,  5.19it/s]
    497/499      0.206G      0.02624     0.008781    0.02015          4         320:
72%|#######2    | 29/40 [00:05<00:02,  5.11it/s]
    497/499      0.206G      0.02638     0.008718    0.01993          2         320:
72%|#######2    | 29/40 [00:05<00:02,  5.11it/s]
    497/499      0.206G      0.02638     0.008718    0.01993          2         320:
75%|#######5    | 30/40 [00:05<00:01,  5.30it/s]
    497/499      0.206G      0.02675     0.008713    0.01971          2         320:
```

```
 75%|#######5   | 30/40 [00:05<00:01,  5.30it/s]
     497/499      0.206G    0.02675    0.008713    0.01971         2       320:
 78%|#######7   | 31/40 [00:05<00:01,  5.43it/s]
     497/499      0.206G    0.02648    0.008838     0.0197         4       320:
 78%|#######7   | 31/40 [00:05<00:01,  5.43it/s]
     497/499      0.206G    0.02648    0.008838     0.0197         4       320:
 80%|########   | 32/40 [00:05<00:01,  5.40it/s]
     497/499      0.206G    0.02599    0.008669    0.01957         1       320:
 80%|########   | 32/40 [00:06<00:01,  5.40it/s]
     497/499      0.206G    0.02599    0.008669    0.01957         1       320:
 82%|########2  | 33/40 [00:06<00:01,  5.52it/s]
     497/499      0.206G    0.02624    0.008813    0.02006         4       320:
 82%|########2  | 33/40 [00:06<00:01,  5.52it/s]
     497/499      0.206G    0.02624    0.008813    0.02006         4       320:
 85%|########5  | 34/40 [00:06<00:01,  5.32it/s]
     497/499      0.206G    0.02616    0.008736    0.01991         2       320:
 85%|########5  | 34/40 [00:06<00:01,  5.32it/s]
     497/499      0.206G    0.02616    0.008736    0.01991         2       320:
 88%|########7  | 35/40 [00:06<00:00,  5.19it/s]
     497/499      0.206G    0.02645    0.008686    0.01972         2       320:
 88%|########7  | 35/40 [00:06<00:00,  5.19it/s]
     497/499      0.206G    0.02645    0.008686    0.01972         2       320:
 90%|######### | 36/40 [00:06<00:00,  5.36it/s]
     497/499      0.206G    0.02649    0.008634    0.01955         2       320:
 90%|######### | 36/40 [00:06<00:00,  5.36it/s]
     497/499      0.206G    0.02649    0.008634    0.01955         2       320:
 92%|#########2| 37/40 [00:06<00:00,  5.46it/s]
     497/499      0.206G    0.02672    0.008723    0.01946         4       320:
 92%|#########2| 37/40 [00:06<00:00,  5.46it/s]
     497/499      0.206G    0.02672    0.008723    0.01946         4       320:
 95%|#########5| 38/40 [00:06<00:00,  5.57it/s]
     497/499      0.206G    0.02628    0.008663    0.01934         2       320:
 95%|#########5| 38/40 [00:07<00:00,  5.57it/s]
     497/499      0.206G    0.02628    0.008663    0.01934         2       320:
 98%|#########7| 39/40 [00:07<00:00,  5.64it/s]
     497/499      0.206G    0.02592    0.008549    0.01918         1       320:
 98%|#########7| 39/40 [00:07<00:00,  5.64it/s]
     497/499      0.206G    0.02592    0.008549    0.01918         1       320:
100%|##########| 40/40 [00:07<00:00,  5.68it/s]
     497/499      0.206G    0.02592    0.008549    0.01918         1       320:
100%|##########| 40/40 [00:07<00:00,  5.47it/s]


             Class     Images  Instances          P          R      mAP50
mAP50-95:    0%|            | 0/20 [00:00<?, ?it/s]
             Class     Images  Instances          P          R      mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:01, 15.99it/s]
             Class     Images  Instances          P          R      mAP50
mAP50-95:   20%|##         | 4/20 [00:00<00:01, 14.90it/s]
```

```
                  Class      Images  Instances        P          R        mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 14.88it/s]
                  Class      Images  Instances        P          R        mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 14.28it/s]
                  Class      Images  Instances        P          R        mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 14.85it/s]
                  Class      Images  Instances        P          R        mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 14.63it/s]
                  Class      Images  Instances        P          R        mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 14.98it/s]
                  Class      Images  Instances        P          R        mAP50
mAP50-95:  80%|########    | 16/20 [00:01<00:00, 15.28it/s]
                  Class      Images  Instances        P          R        mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 14.93it/s]
                  Class      Images  Instances        P          R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.71it/s]
                  Class      Images  Instances        P          R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.83it/s]
                    all        40         40        0.97      0.935       0.995
0.804

        Epoch     GPU_mem    box_loss    obj_loss    cls_loss   Instances       Size

   0%|            | 0/40 [00:00<?, ?it/s]
     498/499      0.206G     0.02039     0.01552     0.02948          4        320:
0%|           | 0/40 [00:00<?, ?it/s]
     498/499      0.206G     0.02039     0.01552     0.02948          4        320:
2%|2          | 1/40 [00:00<00:07,  5.03it/s]
     498/499      0.206G      0.0151     0.01035     0.02129          1        320:
2%|2          | 1/40 [00:00<00:07,  5.03it/s]
     498/499      0.206G      0.0151     0.01035     0.02129          1        320:
5%|5          | 2/40 [00:00<00:07,  5.16it/s]
     498/499      0.206G     0.01455    0.008955     0.01938          2        320:
5%|5          | 2/40 [00:00<00:07,  5.16it/s]
     498/499      0.206G     0.01455    0.008955     0.01938          2        320:
8%|7          | 3/40 [00:00<00:07,  5.05it/s]
     498/499      0.206G     0.01628     0.01111       0.018          4        320:
8%|7          | 3/40 [00:00<00:07,  5.05it/s]
     498/499      0.206G     0.01628     0.01111       0.018          4        320:
10%|#          | 4/40 [00:00<00:07,  4.97it/s]
     498/499      0.206G     0.01683     0.01138     0.02009          4        320:
10%|#          | 4/40 [00:01<00:07,  4.97it/s]
     498/499      0.206G     0.01683     0.01138     0.02009          4        320:
12%|#2         | 5/40 [00:01<00:07,  4.95it/s]
     498/499      0.206G     0.01805     0.01173     0.01995          4        320:
12%|#2         | 5/40 [00:01<00:07,  4.95it/s]
     498/499      0.206G     0.01805     0.01173     0.01995          4        320:
15%|#5         | 6/40 [00:01<00:06,  4.94it/s]
```

```
     498/499      0.206G     0.01663     0.01103     0.01931          2          320:
15%|#5          | 6/40 [00:01<00:06,  4.94it/s]
     498/499      0.206G     0.01663     0.01103     0.01931          2          320:
18%|#7          | 7/40 [00:01<00:06,  4.91it/s]
     498/499      0.206G     0.02125     0.01061     0.01906          3          320:
18%|#7          | 7/40 [00:01<00:06,  4.91it/s]
     498/499      0.206G     0.02125     0.01061     0.01906          3          320:
20%|##          | 8/40 [00:01<00:06,  5.04it/s]
     498/499      0.206G     0.02018     0.01019     0.01863          2          320:
20%|##          | 8/40 [00:01<00:06,  5.04it/s]
     498/499      0.206G     0.02018     0.01019     0.01863          2          320:
22%|##2         | 9/40 [00:01<00:05,  5.24it/s]
     498/499      0.206G     0.02068     0.01078     0.01846          4          320:
22%|##2         | 9/40 [00:01<00:05,  5.24it/s]
     498/499      0.206G     0.02068     0.01078     0.01846          4          320:
25%|##5         | 10/40 [00:01<00:05,  5.27it/s]
     498/499      0.206G     0.01943     0.01011      0.0183          1          320:
25%|##5         | 10/40 [00:02<00:05,  5.27it/s]
     498/499      0.206G     0.01943     0.01011      0.0183          1          320:
28%|##7         | 11/40 [00:02<00:05,  5.57it/s]
     498/499      0.206G     0.02076     0.00977     0.01859          3          320:
28%|##7         | 11/40 [00:02<00:05,  5.57it/s]
     498/499      0.206G     0.02076     0.00977     0.01859          3          320:
30%|###         | 12/40 [00:02<00:04,  5.65it/s]
     498/499      0.206G     0.02029      0.0097     0.01861          2          320:
30%|###         | 12/40 [00:02<00:04,  5.65it/s]
     498/499      0.206G     0.02029      0.0097     0.01861          2          320:
32%|###2        | 13/40 [00:02<00:04,  5.68it/s]
     498/499      0.206G     0.02302    0.009456     0.01839          2          320:
32%|###2        | 13/40 [00:02<00:04,  5.68it/s]
     498/499      0.206G     0.02302    0.009456     0.01839          2          320:
35%|###5        | 14/40 [00:02<00:04,  5.43it/s]
     498/499      0.206G      0.0231    0.009335     0.01852          2          320:
35%|###5        | 14/40 [00:02<00:04,  5.43it/s]
     498/499      0.206G      0.0231    0.009335     0.01852          2          320:
38%|###7        | 15/40 [00:02<00:04,  5.13it/s]
     498/499      0.206G     0.02378     0.00962     0.01865          4          320:
38%|###7        | 15/40 [00:03<00:04,  5.13it/s]
     498/499      0.206G     0.02378     0.00962     0.01865          4          320:
40%|####        | 16/40 [00:03<00:04,  5.19it/s]
     498/499      0.206G     0.02334    0.009539     0.02017          2          320:
40%|####        | 16/40 [00:03<00:04,  5.19it/s]
     498/499      0.206G     0.02334    0.009539     0.02017          2          320:
42%|####2       | 17/40 [00:03<00:04,  5.11it/s]
     498/499      0.206G     0.02243    0.009153     0.01993          1          320:
42%|####2       | 17/40 [00:03<00:04,  5.11it/s]
     498/499      0.206G     0.02243    0.009153     0.01993          1          320:
45%|####5       | 18/40 [00:03<00:04,  5.41it/s]
```

```
        498/499      0.206G     0.02399    0.009279     0.02059            2          320:
45%|####5        | 18/40 [00:03<00:04,  5.41it/s]
        498/499      0.206G     0.02399    0.009279     0.02059            2          320:
48%|####7        | 19/40 [00:03<00:03,  5.40it/s]
        498/499      0.206G     0.02456    0.009791      0.0211            4          320:
48%|####7        | 19/40 [00:03<00:03,  5.40it/s]
        498/499      0.206G     0.02456    0.009791      0.0211            4          320:
50%|#####        | 20/40 [00:03<00:03,  5.52it/s]
        498/499      0.206G     0.02418    0.009972     0.02097            4          320:
50%|#####        | 20/40 [00:03<00:03,  5.52it/s]
        498/499      0.206G     0.02418    0.009972     0.02097            4          320:
52%|#####2       | 21/40 [00:03<00:03,  5.58it/s]
        498/499      0.206G     0.02524     0.01014     0.02091            4          320:
52%|#####2       | 21/40 [00:04<00:03,  5.58it/s]
        498/499      0.206G     0.02524     0.01014     0.02091            4          320:
55%|#####5       | 22/40 [00:04<00:03,  5.50it/s]
        498/499      0.206G     0.02459     0.01007     0.02053            2          320:
55%|#####5       | 22/40 [00:04<00:03,  5.50it/s]
        498/499      0.206G     0.02459     0.01007     0.02053            2          320:
57%|#####7       | 23/40 [00:04<00:03,  5.59it/s]
        498/499      0.206G     0.02404    0.009818      0.0202            1          320:
57%|#####7       | 23/40 [00:04<00:03,  5.59it/s]
        498/499      0.206G     0.02404    0.009818      0.0202            1          320:
60%|######       | 24/40 [00:04<00:02,  5.78it/s]
        498/499      0.206G     0.02399     0.01005     0.02021            4          320:
60%|######       | 24/40 [00:04<00:02,  5.78it/s]
        498/499      0.206G     0.02399     0.01005     0.02021            4          320:
62%|######2      | 25/40 [00:04<00:02,  5.79it/s]
        498/499      0.206G     0.02413     0.01022     0.02048            4          320:
62%|######2      | 25/40 [00:04<00:02,  5.79it/s]
        498/499      0.206G     0.02413     0.01022     0.02048            4          320:
65%|######5      | 26/40 [00:04<00:02,  5.65it/s]
        498/499      0.206G     0.02507     0.01031     0.02081            2          320:
65%|######5      | 26/40 [00:05<00:02,  5.65it/s]
        498/499      0.206G     0.02507     0.01031     0.02081            2          320:
68%|######7      | 27/40 [00:05<00:02,  5.54it/s]
        498/499      0.206G     0.02604     0.01014     0.02068            2          320:
68%|######7      | 27/40 [00:05<00:02,  5.54it/s]
        498/499      0.206G     0.02604     0.01014     0.02068            2          320:
70%|#######      | 28/40 [00:05<00:02,  5.48it/s]
        498/499      0.206G     0.02578     0.01008     0.02099            3          320:
70%|#######      | 28/40 [00:05<00:02,  5.48it/s]
        498/499      0.206G     0.02578     0.01008     0.02099            3          320:
72%|#######2     | 29/40 [00:05<00:02,  5.30it/s]
        498/499      0.206G     0.02527    0.009929     0.02078            1          320:
72%|#######2     | 29/40 [00:05<00:02,  5.30it/s]
        498/499      0.206G     0.02527    0.009929     0.02078            1          320:
75%|#######5     | 30/40 [00:05<00:01,  5.43it/s]
```

```
     498/499      0.206G     0.02542     0.009907      0.0207         2        320:
75%|#######5  | 30/40 [00:05<00:01,  5.43it/s]
     498/499      0.206G     0.02542     0.009907      0.0207         2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.26it/s]
     498/499      0.206G     0.02626     0.00976     0.02055          2        320:
78%|#######7  | 31/40 [00:05<00:01,  5.26it/s]
     498/499      0.206G     0.02626     0.00976     0.02055          2        320:
80%|########  | 32/40 [00:05<00:01,  5.28it/s]
     498/499      0.206G     0.02638     0.009636    0.02068          2        320:
80%|########  | 32/40 [00:06<00:01,  5.28it/s]
     498/499      0.206G     0.02638     0.009636    0.02068          2        320:
82%|########2 | 33/40 [00:06<00:01,  5.29it/s]
     498/499      0.206G      0.0267     0.00954     0.02063          2        320:
82%|########2 | 33/40 [00:06<00:01,  5.29it/s]
     498/499      0.206G      0.0267     0.00954     0.02063          2        320:
85%|########5 | 34/40 [00:06<00:01,  5.30it/s]
     498/499      0.206G     0.02688     0.009714    0.02097          4        320:
85%|########5 | 34/40 [00:06<00:01,  5.30it/s]
     498/499      0.206G     0.02688     0.009714    0.02097          4        320:
88%|########7 | 35/40 [00:06<00:00,  5.30it/s]
     498/499      0.206G     0.02716     0.00997     0.02095          4        320:
88%|########7 | 35/40 [00:06<00:00,  5.30it/s]
     498/499      0.206G     0.02716     0.00997     0.02095          4        320:
90%|######### | 36/40 [00:06<00:00,  5.43it/s]
     498/499      0.206G     0.02657     0.009778    0.02083          1        320:
90%|######### | 36/40 [00:06<00:00,  5.43it/s]
     498/499      0.206G     0.02657     0.009778    0.02083          1        320:
92%|#########2| 37/40 [00:06<00:00,  5.54it/s]
     498/499      0.206G     0.02614     0.009591    0.02056          1        320:
92%|#########2| 37/40 [00:07<00:00,  5.54it/s]
     498/499      0.206G     0.02614     0.009591    0.02056          1        320:
95%|#########5| 38/40 [00:07<00:00,  5.41it/s]
     498/499      0.206G     0.02569     0.009464    0.02039          1        320:
95%|#########5| 38/40 [00:07<00:00,  5.41it/s]
     498/499      0.206G     0.02569     0.009464    0.02039          1        320:
98%|#########7| 39/40 [00:07<00:00,  5.58it/s]
     498/499      0.206G     0.02555     0.009554    0.02062          4        320:
98%|#########7| 39/40 [00:07<00:00,  5.58it/s]
     498/499      0.206G     0.02555     0.009554    0.02062          4        320:
100%|#########| 40/40 [00:07<00:00,  5.65it/s]
     498/499      0.206G     0.02555     0.009554    0.02062          4        320:
100%|#########| 40/40 [00:07<00:00,  5.38it/s]


              Class      Images  Instances          P         R       mAP50
mAP50-95:    0%|             | 0/20 [00:00<?, ?it/s]
              Class      Images  Instances          P         R       mAP50
mAP50-95:   10%|#          | 2/20 [00:00<00:00, 18.29it/s]
              Class      Images  Instances          P         R       mAP50
```

```
mAP50-95:  20%|##         | 4/20 [00:00<00:00, 18.20it/s]
              Class      Images  Instances         P          R      mAP50
mAP50-95:  30%|###        | 6/20 [00:00<00:00, 18.24it/s]
              Class      Images  Instances         P          R      mAP50
mAP50-95:  40%|####       | 8/20 [00:00<00:00, 18.26it/s]
              Class      Images  Instances         P          R      mAP50
mAP50-95:  50%|#####      | 10/20 [00:00<00:00, 18.27it/s]
              Class      Images  Instances         P          R      mAP50
mAP50-95:  60%|######     | 12/20 [00:00<00:00, 17.24it/s]
              Class      Images  Instances         P          R      mAP50
mAP50-95:  70%|#######    | 14/20 [00:00<00:00, 16.92it/s]
              Class      Images  Instances         P          R      mAP50
mAP50-95:  80%|########   | 16/20 [00:00<00:00, 17.33it/s]
              Class      Images  Instances         P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 17.61it/s]
              Class      Images  Instances         P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.41it/s]
              Class      Images  Instances         P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.26it/s]
                all         40         40       0.97      0.935      0.995
0.804

      Epoch    GPU_mem   box_loss   obj_loss   cls_loss  Instances       Size

  0%|          | 0/40 [00:00<?, ?it/s]
    499/499     0.206G    0.02556   0.009209    0.01567          2        320:
0%|          | 0/40 [00:00<?, ?it/s]
    499/499     0.206G    0.02556   0.009209    0.01567          2        320:
2%|2         | 1/40 [00:00<00:06,  6.40it/s]
    499/499     0.206G    0.02893    0.01158     0.0183          4        320:
2%|2         | 1/40 [00:00<00:06,  6.40it/s]
    499/499     0.206G    0.02893    0.01158     0.0183          4        320:
5%|5         | 2/40 [00:00<00:06,  5.87it/s]
    499/499     0.206G    0.03137    0.01144    0.02529          3        320:
5%|5         | 2/40 [00:00<00:06,  5.87it/s]
    499/499     0.206G    0.03137    0.01144    0.02529          3        320:
8%|7         | 3/40 [00:00<00:06,  5.92it/s]
    499/499     0.206G    0.02752    0.01015    0.02401          2        320:
8%|7         | 3/40 [00:00<00:06,  5.92it/s]
    499/499     0.206G    0.02752    0.01015    0.02401          2        320:
10%|#         | 4/40 [00:00<00:06,  5.67it/s]
    499/499     0.206G    0.02294   0.008709    0.02215          1        320:
10%|#         | 4/40 [00:00<00:06,  5.67it/s]
    499/499     0.206G    0.02294   0.008709    0.02215          1        320:
12%|#2        | 5/40 [00:00<00:06,  5.71it/s]
    499/499     0.206G     0.0239   0.009716    0.02165          4        320:
12%|#2        | 5/40 [00:01<00:06,  5.71it/s]
    499/499     0.206G     0.0239   0.009716    0.02165          4        320:
```

```
15%|#5         | 6/40 [00:01<00:05,  5.75it/s]
     499/499    0.206G    0.02192    0.00884    0.02063         1       320:
15%|#5         | 6/40 [00:01<00:05,  5.75it/s]
     499/499    0.206G    0.02192    0.00884    0.02063         1       320:
18%|#7         | 7/40 [00:01<00:05,  5.77it/s]
     499/499    0.206G    0.02108    0.00822    0.02005         1       320:
18%|#7         | 7/40 [00:01<00:05,  5.77it/s]
     499/499    0.206G    0.02108    0.00822    0.02005         1       320:
20%|##         | 8/40 [00:01<00:05,  5.77it/s]
     499/499    0.206G    0.01966    0.00795    0.01967         2       320:
20%|##         | 8/40 [00:01<00:05,  5.77it/s]
     499/499    0.206G    0.01966    0.00795    0.01967         2       320:
22%|##2        | 9/40 [00:01<00:05,  5.95it/s]
     499/499    0.206G    0.01769    0.007306    0.0177         0       320:
22%|##2        | 9/40 [00:01<00:05,  5.95it/s]
     499/499    0.206G    0.01769    0.007306    0.0177         0       320:
25%|##5        | 10/40 [00:01<00:04,  6.27it/s]
     499/499    0.206G    0.01792    0.00797    0.01755         4       320:
25%|##5        | 10/40 [00:01<00:04,  6.27it/s]
     499/499    0.206G    0.01792    0.00797    0.01755         4       320:
28%|##7        | 11/40 [00:01<00:04,  5.94it/s]
     499/499    0.206G    0.01821    0.00866    0.01774         4       320:
28%|##7        | 11/40 [00:02<00:04,  5.94it/s]
     499/499    0.206G    0.01821    0.00866    0.01774         4       320:
30%|###        | 12/40 [00:02<00:05,  5.28it/s]
     499/499    0.206G    0.01752    0.008263    0.01742         1       320:
30%|###        | 12/40 [00:02<00:05,  5.28it/s]
     499/499    0.206G    0.01752    0.008263    0.01742         1       320:
32%|###2       | 13/40 [00:02<00:04,  5.43it/s]
     499/499    0.206G    0.01719    0.008073    0.01723         2       320:
32%|###2       | 13/40 [00:02<00:04,  5.43it/s]
     499/499    0.206G    0.01719    0.008073    0.01723         2       320:
35%|###5       | 14/40 [00:02<00:04,  5.55it/s]
     499/499    0.206G    0.01673    0.007793    0.01706         1       320:
35%|###5       | 14/40 [00:02<00:04,  5.55it/s]
     499/499    0.206G    0.01673    0.007793    0.01706         1       320:
38%|###7       | 15/40 [00:02<00:04,  5.47it/s]
     499/499    0.206G    0.01732    0.007514    0.01694         1       320:
38%|###7       | 15/40 [00:02<00:04,  5.47it/s]
     499/499    0.206G    0.01732    0.007514    0.01694         1       320:
40%|####       | 16/40 [00:02<00:04,  5.29it/s]
     499/499    0.206G    0.0172    0.007461    0.0168         1       320:
40%|####       | 16/40 [00:03<00:04,  5.29it/s]
     499/499    0.206G    0.0172    0.007461    0.0168         1       320:
42%|####2      | 17/40 [00:03<00:04,  5.30it/s]
     499/499    0.206G    0.01731    0.007802    0.01721         4       320:
42%|####2      | 17/40 [00:03<00:04,  5.30it/s]
     499/499    0.206G    0.01731    0.007802    0.01721         4       320:
```

```
45%|####5        | 18/40 [00:03<00:04,  5.31it/s]
     499/499    0.206G    0.01725   0.008092   0.01723      4        320:
45%|####5        | 18/40 [00:03<00:04,  5.31it/s]
     499/499    0.206G    0.01725   0.008092   0.01723      4        320:
48%|####7        | 19/40 [00:03<00:04,  5.19it/s]
     499/499    0.206G    0.01797   0.008724   0.01728      4        320:
48%|####7        | 19/40 [00:03<00:04,  5.19it/s]
     499/499    0.206G    0.01797   0.008724   0.01728      4        320:
50%|#####        | 20/40 [00:03<00:03,  5.13it/s]
     499/499    0.206G    0.01749   0.008457   0.01707      1        320:
50%|#####        | 20/40 [00:03<00:03,  5.13it/s]
     499/499    0.206G    0.01749   0.008457   0.01707      1        320:
52%|#####2       | 21/40 [00:03<00:03,  5.32it/s]
     499/499    0.206G    0.01733   0.008545   0.01697      2        320:
52%|#####2       | 21/40 [00:03<00:03,  5.32it/s]
     499/499    0.206G    0.01733   0.008545   0.01697      2        320:
55%|#####5       | 22/40 [00:03<00:03,  5.60it/s]
     499/499    0.206G    0.01746   0.008881     0.017      4        320:
55%|#####5       | 22/40 [00:04<00:03,  5.60it/s]
     499/499    0.206G    0.01746   0.008881     0.017      4        320:
57%|#####7       | 23/40 [00:04<00:03,  5.32it/s]
     499/499    0.206G    0.01707   0.008747     0.017      2        320:
57%|#####7       | 23/40 [00:04<00:03,  5.32it/s]
     499/499    0.206G    0.01707   0.008747     0.017      2        320:
60%|######       | 24/40 [00:04<00:02,  5.46it/s]
     499/499    0.206G    0.01734   0.008857   0.01683      2        320:
60%|######       | 24/40 [00:04<00:02,  5.46it/s]
     499/499    0.206G    0.01734   0.008857   0.01683      2        320:
62%|######2      | 25/40 [00:04<00:02,  5.40it/s]
     499/499    0.206G    0.01697   0.008636   0.01672      1        320:
62%|######2      | 25/40 [00:04<00:02,  5.40it/s]
     499/499    0.206G    0.01697   0.008636   0.01672      1        320:
65%|######5      | 26/40 [00:04<00:02,  5.24it/s]
     499/499    0.206G    0.01749   0.008598   0.01676      2        320:
65%|######5      | 26/40 [00:04<00:02,  5.24it/s]
     499/499    0.206G    0.01749   0.008598   0.01676      2        320:
68%|######7      | 27/40 [00:04<00:02,  5.14it/s]
     499/499    0.206G    0.01784   0.008985   0.01681      4        320:
68%|######7      | 27/40 [00:05<00:02,  5.14it/s]
     499/499    0.206G    0.01784   0.008985   0.01681      4        320:
70%|#######      | 28/40 [00:05<00:02,  5.20it/s]
     499/499    0.206G    0.01811   0.008952   0.01701      2        320:
70%|#######      | 28/40 [00:05<00:02,  5.20it/s]
     499/499    0.206G    0.01811   0.008952   0.01701      2        320:
72%|#######2     | 29/40 [00:05<00:02,  5.24it/s]
     499/499    0.206G     0.0194   0.008954   0.01717      2        320:
72%|#######2     | 29/40 [00:05<00:02,  5.24it/s]
     499/499    0.206G     0.0194   0.008954   0.01717      2        320:
```

```
75%|#######5  | 30/40 [00:05<00:01,  5.27it/s]
    499/499      0.206G     0.01902    0.008847     0.01711          2         320:
75%|#######5  | 30/40 [00:05<00:01,  5.27it/s]
    499/499      0.206G     0.01902    0.008847     0.01711          2         320:
78%|#######7  | 31/40 [00:05<00:01,  5.26it/s]
    499/499      0.206G      0.0194    0.008965     0.01708          4         320:
78%|#######7  | 31/40 [00:05<00:01,  5.26it/s]
    499/499      0.206G      0.0194    0.008965     0.01708          4         320:
80%|######## | 32/40 [00:05<00:01,  5.15it/s]
    499/499      0.206G     0.01968    0.009119     0.01733          4         320:
80%|######## | 32/40 [00:06<00:01,  5.15it/s]
    499/499      0.206G     0.01968    0.009119     0.01733          4         320:
82%|########2 | 33/40 [00:06<00:01,  4.79it/s]
    499/499      0.206G     0.02024    0.009237     0.01735          3         320:
82%|########2 | 33/40 [00:06<00:01,  4.79it/s]
    499/499      0.206G     0.02024    0.009237     0.01735          3         320:
85%|########5 | 34/40 [00:06<00:01,  4.89it/s]
    499/499      0.206G     0.02007    0.009137     0.01728          1         320:
85%|########5 | 34/40 [00:06<00:01,  4.89it/s]
    499/499      0.206G     0.02007    0.009137     0.01728          1         320:
88%|########7 | 35/40 [00:06<00:00,  5.01it/s]
    499/499      0.206G     0.02093    0.009107     0.01726          2         320:
88%|########7 | 35/40 [00:06<00:00,  5.01it/s]
    499/499      0.206G     0.02093    0.009107     0.01726          2         320:
90%|######### | 36/40 [00:06<00:00,  4.86it/s]
    499/499      0.206G     0.02081     0.00907     0.01742          2         320:
90%|######### | 36/40 [00:06<00:00,  4.86it/s]
    499/499      0.206G     0.02081     0.00907     0.01742          2         320:
92%|#########2| 37/40 [00:06<00:00,  4.88it/s]
    499/499      0.206G     0.02059    0.008975     0.01752          1         320:
92%|#########2| 37/40 [00:07<00:00,  4.88it/s]
    499/499      0.206G     0.02059    0.008975     0.01752          1         320:
95%|#########5| 38/40 [00:07<00:00,  4.88it/s]
    499/499      0.206G     0.02137    0.009015     0.01766          3         320:
95%|#########5| 38/40 [00:07<00:00,  4.88it/s]
    499/499      0.206G     0.02137    0.009015     0.01766          3         320:
98%|#########7| 39/40 [00:07<00:00,  4.79it/s]
    499/499      0.206G     0.02164    0.009109     0.01782          4         320:
98%|#########7| 39/40 [00:07<00:00,  4.79it/s]
    499/499      0.206G     0.02164    0.009109     0.01782          4         320:
100%|##########| 40/40 [00:07<00:00,  4.73it/s]
    499/499      0.206G     0.02164    0.009109     0.01782          4         320:
100%|##########| 40/40 [00:07<00:00,  5.28it/s]

            Class      Images  Instances          P          R       mAP50
mAP50-95:   0%|            | 0/20 [00:00<?, ?it/s]
            Class      Images  Instances          P          R       mAP50
mAP50-95:  10%|#           | 2/20 [00:00<00:01, 15.26it/s]
```

337

```
              Class     Images  Instances          P           R        mAP50
mAP50-95:  20%|##          | 4/20 [00:00<00:01, 14.91it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  30%|###         | 6/20 [00:00<00:00, 15.38it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  40%|####        | 8/20 [00:00<00:00, 16.41it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  50%|#####       | 10/20 [00:00<00:00, 14.65it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  60%|######      | 12/20 [00:00<00:00, 15.22it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  70%|#######     | 14/20 [00:00<00:00, 15.47it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  80%|########    | 16/20 [00:01<00:00, 15.63it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 15.55it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 16.43it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 15.72it/s]
                all         40         40       0.978       0.969        0.99
0.803


500 epochs completed in 1.260 hours.
Optimizer stripped from runs\train\exp5\weights\last.pt, 14.4MB
Optimizer stripped from runs\train\exp5\weights\best.pt, 14.4MB


Validating runs\train\exp5\weights\best.pt…
Fusing layers…
Model summary: 157 layers, 7055974 parameters, 0 gradients, 15.9 GFLOPs


              Class     Images  Instances          P           R        mAP50
mAP50-95:   0%|          | 0/20 [00:00<?, ?it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:   5%|5         | 1/20 [00:00<00:03,  4.92it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  15%|#5        | 3/20 [00:00<00:01,  8.60it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  25%|##5       | 5/20 [00:00<00:01, 11.25it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  35%|###5      | 7/20 [00:00<00:01, 12.86it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  45%|####5     | 9/20 [00:00<00:00, 14.48it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  60%|######    | 12/20 [00:00<00:00, 16.27it/s]
              Class     Images  Instances          P           R        mAP50
mAP50-95:  70%|#######   | 14/20 [00:01<00:00, 16.31it/s]
              Class     Images  Instances          P           R        mAP50
```

```
mAP50-95:  80%|########  | 16/20 [00:01<00:00, 16.02it/s]
                  Class      Images  Instances          P          R      mAP50
mAP50-95:  90%|######### | 18/20 [00:01<00:00, 16.62it/s]
                  Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 17.06it/s]
                  Class      Images  Instances          P          R      mAP50
mAP50-95: 100%|##########| 20/20 [00:01<00:00, 14.67it/s]
                    all          40         40      0.961      0.951      0.991
0.817
                  awake          40         20          1      0.903      0.987
0.761
                 drowsy          40         20      0.921          1      0.995
0.873
Results saved to runs\train\exp5
```

[59]:
```python
model = torch.hub.load('ultralytics/yolov5','custom',path = 'yolov5/runs/train/
 ↪exp5/weights/last.pt',force_reload = True)
```

```
Downloading: "https://github.com/ultralytics/yolov5/zipball/master" to
C:\Users\KIIT/.cache\torch\hub\master.zip
YOLOv5  2023-7-11 Python-3.9.13 torch-2.0.1+cu117 CUDA:0 (GeForce MX330,
2048MiB)

Fusing layers…
Model summary: 157 layers, 7055974 parameters, 0 gradients, 15.9 GFLOPs
Adding AutoShape…
```
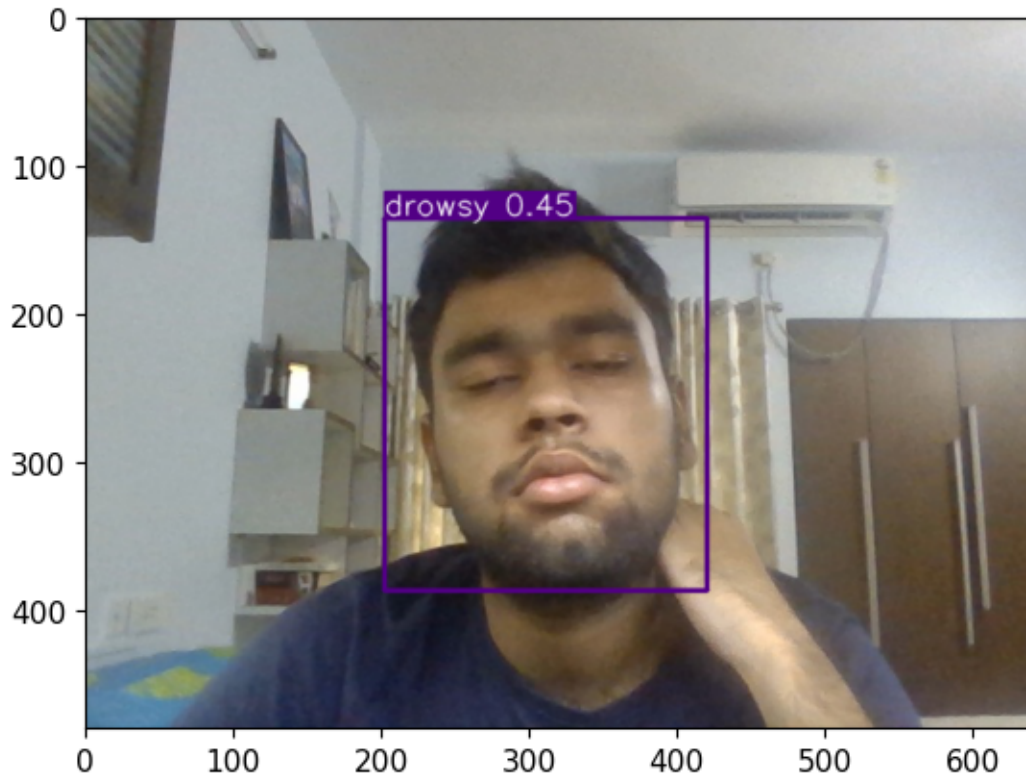
[66]:
```python
img = os.path.join('data','images','drowsy.f3e2f51d-1d6b-11ee-873f-c8b29bf2e5e6.
 ↪jpg')
results = model(img)
%matplotlib inline
plt.imshow(np.squeeze(results.render()))
plt.show
```

[66]: <function matplotlib.pyplot.show(close=None, block=None)>

```
[69]:  #real time detections
       #if you want ot use any other video you can add the path in videocapture
       cap = cv2.VideoCapture(0)
       while cap.isOpened():
           ret,frame = cap.read()
           #make detections
           results = model(frame)

           cv2.imshow('Detection',np.squeeze(results.render()))
           if cv2.waitKey(10) & 0xFF == ord('q'):
               break
       cap.release()
       cv2.destroyAllWindows()

[ ]:
```