

```

## get needed libs
!pip install torch==1.8.1+cu111 torchvision==0.9.1+cu111
torchaudio===0.8.1 -f
https://download.pytorch.org/whl/lts/1.8/torch_lts.html

Looking in links:
https://download.pytorch.org/whl/lts/1.8/torch_lts.html
ERROR: Could not find a version that satisfies the requirement
torch==1.8.1+cu111 (from versions: 1.11.0, 1.12.0, 1.12.1, 1.13.0,
1.13.1, 2.0.0, 2.0.1, 2.1.0, 2.1.1)
ERROR: No matching distribution found for torch==1.8.1+cu111

# get model from repo
# we use yolov5 bcs it is a efficient yet accurate model, this model
can run at a decen fps on a cpu
# the model is also well documented and has many examples...
# even if the model has not been trained in something related to
hands, vailable documentation on fine tuning is online
!git clone https://github.com/ultralytics/yolov5

Cloning into 'yolov5'...
remote: Enumerating objects: 16074, done.ote: Counting objects: 100%
(18/18), done.ote: Compressing objects: 100% (17/17), done.ote: Total
16074 (delta 5), reused 9 (delta 1), pack-reused 16056

import torch
from matplotlib import pyplot as plt
import numpy as np
import cv2

#install reqs
!cd yolov5 & pip install -r requirements.txt

ERROR: Could not open requirements file: [Errno 2] No such file or
directory: 'requirements.txt'

model = torch.hub.load('ultralytics/yolov5', 'yolov5s')

/usr/local/lib/python3.10/dist-packages/torch/hub.py:294: UserWarning:
You are about to download and run code from an untrusted repository.
In a future release, this won't be allowed. To add the repository to
your trusted list, change the command to {calling_fn}(...,
trust_repo=False) and a command prompt will appear asking for an
explicit confirmation of trust, or load(..., trust_repo=True), which
will assume that the prompt is to be answered with 'yes'. You can also
use load(..., trust_repo='check') which will only prompt for
confirmation if the repo is not already trusted. This will eventually
be the default behaviour
  warnings.warn(
Downloading: "https://github.com/ultralytics/yolov5/zipball/master" to
/root/.cache/torch/hub/master.zip

```

```
requirements: Ultralytics requirements ['gitpython>=3.1.30',
'Pillow>=10.0.1'] not found, attempting AutoUpdate...
Collecting gitpython>=3.1.30
  Downloading GitPython-3.1.40-py3-none-any.whl (190 kB)
    _____ 190.6/190.6 kB 7.0 MB/s
eta 0:00:00
Collecting Pillow>=10.0.1
  Downloading Pillow-10.1.0-cp310-cp310-manylinux_2_28_x86_64.whl (3.6
MB)
    _____ 3.6/3.6 MB 29.0 MB/s eta
0:00:00
Collecting gitdb<5,>=4.0.1 (from gitpython>=3.1.30)
  Downloading gitdb-4.0.11-py3-none-any.whl (62 kB)
    _____ 62.7/62.7 kB 253.3 MB/s
eta 0:00:00
Collecting smmap<6,>=3.0.1 (from gitdb<5,>=4.0.1->gitpython>=3.1.30)
  Downloading smmap-5.0.1-py3-none-any.whl (24 kB)
Installing collected packages: smmap, Pillow, gitdb, gitpython
Attempting uninstall: Pillow
Found existing installation: Pillow 9.4.0
Uninstalling Pillow-9.4.0:
Successfully uninstalled Pillow-9.4.0
Successfully installed Pillow-10.1.0 gitdb-4.0.11 gitpython-3.1.40
smmap-5.0.1

requirements: AutoUpdate success ☑ 6.6s, installed 2 packages:
['gitpython>=3.1.30', 'Pillow>=10.0.1']
requirements: ⚠ Restart runtime or rerun command for updates to take
effect
```

YOLOv5 🚀 2023-11-21 Python-3.10.12 torch-2.1.0+cu118 CUDA:0 (Tesla T4, 15102MiB)

```
Downloading
https://github.com/ultralytics/yolov5/releases/download/v7.0/yolov5s.p
t to yolov5s.pt...
100%|██████████| 14.1M/14.1M [00:00<00:00, 217MB/s]
```

```
Fusing layers...
YOLOv5s summary: 213 layers, 7225885 parameters, 0 gradients, 16.4
GFL0Ps
Adding AutoShape...
```

```
# get the dataset which is already preprocess, labeled and divided
into subfolders
# preprocess was defined by me, for personal preprocess fork original
dataset on roboflow
```

```
!pip install roboflow
```

```

%cd yolov5
from roboflow import Roboflow
rf = Roboflow(api_key="IuYv6K0Ks5p62rFSLvGa")
project = rf.workspace("david-lee-d0rhs").project("american-sign-
language-letters")
dataset = project.version(6).download("yolov5")

Collecting roboflow
  Downloading roboflow-1.1.9-py3-none-any.whl (63 kB)
  63.3/63.3 kB 957.8 kB/s eta
0:00:00
Requirement already satisfied: certifi==2023.7.22 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (2023.7.22)
Collecting chardet==4.0.0 (from roboflow)
  Downloading chardet-4.0.0-py2.py3-none-any.whl (178 kB)
  178.7/178.7 kB 7.9 MB/s eta
0:00:00
  roboflow)
  Downloading cycler-0.10.0-py2.py3-none-any.whl (6.5 kB)
Collecting idna==2.10 (from roboflow)
  Downloading idna-2.10-py2.py3-none-any.whl (58 kB)
  58.8/58.8 kB 7.1 MB/s eta
0:00:00
Requirement already satisfied: kiwisolver>=1.3.1 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (1.4.5)
Requirement already satisfied: matplotlib in
/usr/local/lib/python3.10/dist-packages (from roboflow) (3.7.1)
Requirement already satisfied: numpy>=1.18.5 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (1.23.5)
Collecting opencv-python-headless==4.8.0.74 (from roboflow)
  Downloading opencv_python_headless-4.8.0.74-cp37-abi3-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl (49.1 MB)
  49.1/49.1 MB 14.9 MB/s eta
0:00:00
Requirement already satisfied: Pillow>=7.1.2 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (10.1.0)
Collecting pyparsing==2.4.7 (from roboflow)
  Downloading pyparsing-2.4.7-py2.py3-none-any.whl (67 kB)
  67.8/67.8 kB 5.9 MB/s eta
0:00:00
Requirement already satisfied: python-dateutil in
/usr/local/lib/python3.10/dist-packages (from roboflow) (2.8.2)
Collecting python-dotenv (from roboflow)
  Downloading python_dotenv-1.0.0-py3-none-any.whl (19 kB)
Requirement already satisfied: requests in
/usr/local/lib/python3.10/dist-packages (from roboflow) (2.31.0)
Requirement already satisfied: six in /usr/local/lib/python3.10/dist-
packages (from roboflow) (1.16.0)
Collecting supervision (from roboflow)
  Downloading supervision-0.16.0-py3-none-any.whl (72 kB)

```

```
72.2/72.2 kB 9.5 MB/s eta
0:00:00
ent already satisfied: urllib3>=1.26.6 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (2.0.7)
Requirement already satisfied: tqdm>=4.41.0 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (4.66.1)
Requirement already satisfied: PyYAML>=5.3.1 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (6.0.1)
Collecting requests-toolbelt (from roboflow)
  Downloading requests_toolbelt-1.0.0-py2.py3-none-any.whl (54 kB)


---

54.5/54.5 kB 7.9 MB/s eta
0:00:00
agic (from roboflow)
  Downloading python_magic-0.4.27-py2.py3-none-any.whl (13 kB)
Requirement already satisfied: contourpy>=1.0.1 in
/usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow)
(1.2.0)
Requirement already satisfied: fonttools>=4.22.0 in
/usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow)
(4.44.3)
Requirement already satisfied: packaging>=20.0 in
/usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow)
(23.2)
Requirement already satisfied: charset-normalizer<4,>=2 in
/usr/local/lib/python3.10/dist-packages (from requests->roboflow)
(3.3.2)
Requirement already satisfied: scipy<2.0.0,>=1.9.0 in
/usr/local/lib/python3.10/dist-packages (from supervision->roboflow)
(1.11.3)
Installing collected packages: python-magic, python-dotenv, pyparsing,
opencv-python-headless, idna, cycler, chardet, supervision, requests-
toolbelt, roboflow
  Attempting uninstall: pyparsing
    Found existing installation: pyparsing 3.1.1
    Uninstalling pyparsing-3.1.1:
      Successfully uninstalled pyparsing-3.1.1
  Attempting uninstall: opencv-python-headless
    Found existing installation: opencv-python-headless 4.8.1.78
    Uninstalling opencv-python-headless-4.8.1.78:
      Successfully uninstalled opencv-python-headless-4.8.1.78
  Attempting uninstall: idna
    Found existing installation: idna 3.4
    Uninstalling idna-3.4:
      Successfully uninstalled idna-3.4
  Attempting uninstall: cycler
    Found existing installation: cycler 0.12.1
    Uninstalling cycler-0.12.1:
      Successfully uninstalled cycler-0.12.1
  Attempting uninstall: chardet
```

```

    Found existing installation: chardet 5.2.0
    Uninstalling chardet-5.2.0:
      Successfully uninstalled chardet-5.2.0
Successfully installed chardet-4.0.0 cycler-0.10.0 idna-2.10 opencv-
python-headless-4.8.0.74 pyparsing-2.4.7 python-dotenv-1.0.0 python-
magic-0.4.27 requests-toolbelt-1.0.0 roboflow-1.1.9 supervision-0.16.0

{"pip_warning":{"packages":
["chardet","cv2","cycler","idna","pyparsing"]}}

/content/yolov5
loading Roboflow workspace...
loading Roboflow project...

Downloading Dataset Version Zip in American-Sign-Language-Letters-6 to
yolov5pytorch:: 100%|██████████| 147097/147097 [00:03<00:00,
39462.99it/s]

Extracting Dataset Version Zip to American-Sign-Language-Letters-6 in
yolov5pytorch:: 100%|██████████| 1452/1452 [00:02<00:00, 654.55it/s]

# Save the content to the file (prep for fine tuning)
file_content = """
TRAIN_DIR_IMAGES: '/content/American-Sign-Language-Letters-7/train'
TRAIN_DIR_LABELS: '/content/American-Sign-Language-Letters-7/train'
VALID_DIR_IMAGES: '/content/American-Sign-Language-Letters-7/valid'
VALID_DIR_LABELS: '/content/American-Sign-Language-Letters-7/valid'

# Class names.
CLASSES:
['A','B','C','D','E','F','G','H','I','J','K','L','M','N','O','P','Q','
R','S','T','U','V','W','X','Y','Z']

# Number of classes (object classes + 1 for background class in Faster
RCNN).
NC: 26

# Whether to save the predictions of the validation set while
training.
SAVE_VALID_PREDICTION_IMAGES: True
"""

file_path = '/content/yolov5/dataset.yml'

with open(file_path, 'w') as file:
    file.write(file_content)

```

```
# train the model
```

```
!python train.py --img 320 --batch 16 --epochs 500 --data dataset.yaml  
--weights yolov5s.pt --workers 2 --hyp hyp.scratch-low.yaml
```

```
2023-11-21 14:16:47.133139: E
```

```
tensorflow/compiler/xla/stream_executor/cuda/cuda_dnn.cc:9342] Unable  
to register cuDNN factory: Attempting to register factory for plugin  
cuDNN when one has already been registered
```



```
2023-11-21 14:16:47.133202: E
```

```
tensorflow/compiler/xla/stream_executor/cuda/cuda_fft.cc:609] Unable  
to register cuFFT factory: Attempting to register factory for plugin  
cuFFT when one has already been registered
```


```
2023-11-21 14:16:47.133249: E
```

```
tensorflow/compiler/xla/stream_executor/cuda/cuda_blas.cc:1518] Unable  
to register cuBLAS factory: Attempting to register factory for plugin  
cuBLAS when one has already been registered
```

```
train: weights=yolov5s.pt, cfg=, data=dataset.yaml, hyp=hyp.scratch-  
low.yaml, epochs=500, batch_size=16, 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  v7.0-245-g3d8f004 Python-3.10.12 torch-2.1.0+cu118 CUDA:0  
(Tesla T4, 15102MiB)
```

```
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/
```

```
Downloading https://ultralytics.com/assets/Arial.ttf to  
/root/.config/Ultralytics/Arial.ttf...
```

```
100% 755k/755k [00:00<00:00, 25.1MB/s]
```

```
Downloading
```

```
https://github.com/ultralytics/yolov5/releases/download/v7.0/yolov5s.p  
t to yolov5s.pt...
```

```
100% 14.1M/14.1M [00:00<00:00, 151MB/s]
```

```
Overriding model.yaml nc=80 with nc=26
```

	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      83607  models.yolo.Detect
[26, [[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, 7089751 parameters, 7089751 gradients, 16.2
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

augmentations: Blur(p=0.01, blur_limit=(3, 7)), MedianBlur(p=0.01, blur_limit=(3, 7)), ToGray(p=0.01), CLAHE(p=0.01, clip_limit=(1, 4.0), tile_grid_size=(8, 8))

train: Scanning

/content/yolov5/American-Sign-Language-Letters-6/train/labels... 504 images, 0 backgrounds, 0 corrupt: 100% 504/504 [00:00<00:00, 1433.60it/s]

train: New cache created: /content/yolov5/American-Sign-Language-Letters-6/train/labels.cache

val: Scanning

/content/yolov5/American-Sign-Language-Letters-6/train/labels.cache... 504 images, 0 backgrounds, 0 corrupt: 100% 504/504 [00:00<?, ?it/s]

AutoAnchor: 5.07 anchors/target, 1.000 Best Possible Recall (BPR).

Current anchors are a good fit to dataset ☑

Plotting labels to runs/train/exp/labels.jpg...

Image sizes 320 train, 320 val

Using 2 dataloader workers

Logging results to runs/train/exp

Starting training for 500 epochs...

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	0/499	1.12G	0.1	0.02014	0.08712	24
320:	100% 32/32	[01:00<00:00,	1.89s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100% 16/16	[00:27<00:00,	1.73s/it]		
		all	504	504	0.00212	0.605
0.0042	0.00101					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	1/499	1.12G	0.06439	0.02394	0.08233	17
320:	100% 32/32	[01:04<00:00,	2.01s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100% 16/16	[00:27<00:00,	1.73s/it]		
		all	504	504	0.291	0.0977
0.0386	0.0114					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	2/499	1.13G	0.05792	0.02102	0.08048	22
320:	100%	32/32	[01:01<00:00, 1.93s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.71s/it]		
		all	504	504	0.0194	0.94
0.0683	0.0321					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	3/499	1.13G	0.05253	0.01868	0.07961	19
320:	100%	32/32	[01:01<00:00, 1.91s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:26<00:00, 1.65s/it]		
		all	504	504	0.35	0.0848
0.0968	0.042					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	4/499	1.13G	0.04574	0.01691	0.0789	17
320:	100%	32/32	[01:00<00:00, 1.90s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.73s/it]		
		all	504	504	0.2	0.205
0.136	0.0633					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	5/499	1.13G	0.042	0.0154	0.07746	19
320:	100%	32/32	[01:01<00:00, 1.93s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:24<00:00, 1.54s/it]		
		all	504	504	0.243	0.224
0.165	0.072					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	6/499	1.13G	0.03854	0.01369	0.07747	19
320:	100%	32/32	[01:03<00:00, 2.00s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.70s/it]		
		all	504	504	0.264	0.299
0.187	0.0801					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	7/499	1.13G	0.03678	0.01307	0.07645	16
320:	100%	32/32	[01:00<00:00, 1.89s/it]			

		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.75s/it]		
		all	504	504	0.232	0.216
0.204	0.118					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	8/499	1.13G	0.03582	0.01232	0.0763	17
320:	100%	32/32	[01:01<00:00, 1.91s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:25<00:00, 1.58s/it]		
		all	504	504	0.386	0.213
0.183	0.105					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	9/499	1.13G	0.03469	0.01161	0.07508	16
320:	100%	32/32	[01:01<00:00, 1.91s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.71s/it]		
		all	504	504	0.258	0.242
0.221	0.148					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	10/499	1.13G	0.03224	0.01161	0.07431	27
320:	100%	32/32	[01:00<00:00, 1.90s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:25<00:00, 1.61s/it]		
		all	504	504	0.355	0.256
0.251	0.16					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	11/499	1.13G	0.03181	0.01127	0.0724	18
320:	100%	32/32	[01:01<00:00, 1.92s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:29<00:00, 1.85s/it]		
		all	504	504	0.255	0.291
0.266	0.177					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	12/499	1.13G	0.03081	0.01098	0.07134	22
320:	100%	32/32	[01:01<00:00, 1.92s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.71s/it]		
		all	504	504	0.325	0.311
0.284	0.198					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
13/499	1.13G	0.02941	0.01074	0.07131	18	
320: 100%	32/32	[01:00<00:00, 1.90s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95: 100%	16/16	[00:27<00:00, 1.74s/it]			
	all	504	504	0.332	0.367	
0.304	0.211					
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
14/499	1.13G	0.03001	0.01059	0.07003	22	
320: 100%	32/32	[01:01<00:00, 1.92s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95: 100%	16/16	[00:27<00:00, 1.74s/it]			
	all	504	504	0.372	0.378	
0.319	0.208					
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
15/499	1.13G	0.03042	0.01008	0.06829	19	
320: 100%	32/32	[01:02<00:00, 1.95s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95: 100%	16/16	[00:24<00:00, 1.55s/it]			
	all	504	504	0.372	0.406	
0.333	0.208					
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
16/499	1.13G	0.03068	0.0106	0.06717	21	
320: 100%	32/32	[01:00<00:00, 1.89s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95: 100%	16/16	[00:28<00:00, 1.76s/it]			
	all	504	504	0.35	0.463	
0.37	0.236					
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
17/499	1.13G	0.02995	0.01017	0.06566	18	
320: 100%	32/32	[01:03<00:00, 2.00s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95: 100%	16/16	[00:27<00:00, 1.71s/it]			
	all	504	504	0.425	0.472	
0.376	0.266					
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
18/499	1.13G	0.02742	0.009377	0.06565	15	
320: 100%	32/32	[01:01<00:00, 1.92s/it]				
	Class	Images	Instances	P	R	

mAP50	mAP50-95: 100%	16/16	[00:25<00:00,	1.59s/it]		
0.382	0.275	all	504	504	0.372	0.47

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	19/499	1.13G	0.02731	0.009955	0.06417
320:	100%	32/32	[01:01<00:00,	1.92s/it]	
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:27<00:00,	1.74s/it]	
0.389	0.281	all	504	504	0.458
					0.466

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	20/499	1.13G	0.02888	0.01015	0.063
320:	100%	32/32	[01:01<00:00,	1.92s/it]	
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:24<00:00,	1.54s/it]	
0.415	0.271	all	504	504	0.396
					0.472

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	21/499	1.13G	0.0284	0.01027	0.06117
320:	100%	32/32	[01:02<00:00,	1.96s/it]	
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:27<00:00,	1.72s/it]	
0.461	0.297	all	504	504	0.461
					0.51

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	22/499	1.13G	0.02895	0.01017	0.05838
320:	100%	32/32	[01:03<00:00,	1.98s/it]	
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:28<00:00,	1.75s/it]	
0.482	0.366	all	504	504	0.425
					0.552

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	23/499	1.13G	0.02792	0.01002	0.05821
320:	100%	32/32	[01:00<00:00,	1.89s/it]	
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:25<00:00,	1.61s/it]	
0.467	0.327	all	504	504	0.398
					0.566

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
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Size	24/499	1.13G	0.02809	0.009535	0.0577	13
320:	100%	32/32	[01:02<00:00, 1.95s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.70s/it]		
		all	504	504	0.509	0.55
0.495	0.378					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	25/499	1.13G	0.02667	0.00949	0.05616	17
320:	100%	32/32	[01:02<00:00, 1.95s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:32<00:00, 2.06s/it]		
		all	504	504	0.481	0.534
0.498	0.375					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	26/499	1.13G	0.02679	0.009606	0.05464	22
320:	100%	32/32	[01:05<00:00, 2.05s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:29<00:00, 1.86s/it]		
		all	504	504	0.457	0.571
0.514	0.398					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	27/499	1.13G	0.02749	0.01035	0.05635	16
320:	100%	32/32	[01:07<00:00, 2.11s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:31<00:00, 1.97s/it]		
		all	504	504	0.527	0.55
0.545	0.405					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	28/499	1.13G	0.02773	0.009986	0.05417	23
320:	100%	32/32	[01:05<00:00, 2.04s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:30<00:00, 1.92s/it]		
		all	504	504	0.527	0.609
0.59	0.445					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	29/499	1.13G	0.02678	0.009623	0.05361	18
320:	100%	32/32	[01:06<00:00, 2.06s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:29<00:00, 1.84s/it]		

0.572	0.441	all	504	504	0.477	0.618
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
30/499	1.13G	0.02715	0.01028	0.05377	27	
320: 100%	32/32	[01:06<00:00, 2.07s/it]				
mAP50	mAP50-95: 100%	Class	Images	Instances	P	R
		16/16	[00:28<00:00, 1.75s/it]			
0.597	0.421	all	504	504	0.562	0.614
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
31/499	1.13G	0.02573	0.009532	0.052	16	
320: 100%	32/32	[01:03<00:00, 2.00s/it]				
mAP50	mAP50-95: 100%	Class	Images	Instances	P	R
		16/16	[00:32<00:00, 2.05s/it]			
0.611	0.498	all	504	504	0.436	0.74
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
32/499	1.13G	0.02619	0.009619	0.05036	17	
320: 100%	32/32	[01:03<00:00, 1.98s/it]				
mAP50	mAP50-95: 100%	Class	Images	Instances	P	R
		16/16	[00:31<00:00, 1.98s/it]			
0.584	0.444	all	504	504	0.47	0.677
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
33/499	1.13G	0.02616	0.009703	0.0495	24	
320: 100%	32/32	[01:02<00:00, 1.95s/it]				
mAP50	mAP50-95: 100%	Class	Images	Instances	P	R
		16/16	[00:26<00:00, 1.64s/it]			
0.638	0.454	all	504	504	0.447	0.73
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
34/499	1.13G	0.02644	0.009528	0.04888	18	
320: 100%	32/32	[01:01<00:00, 1.91s/it]				
mAP50	mAP50-95: 100%	Class	Images	Instances	P	R
		16/16	[00:28<00:00, 1.79s/it]			
0.675	0.532	all	504	504	0.524	0.768
Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances

35/499	1.13G	0.02688	0.009234	0.04832	15
320: 100%	32/32	[01:02<00:00, 1.94s/it]			
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:28<00:00, 1.78s/it]		
	all	504	504	0.567	0.767
0.696	0.541				

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	36/499	1.13G	0.02618	0.009657	20
320: 100%	32/32	[01:02<00:00, 1.94s/it]			
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:25<00:00, 1.57s/it]		
	all	504	504	0.557	0.746
0.671	0.527				

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	37/499	1.13G	0.02609	0.009132	18
320: 100%	32/32	[01:01<00:00, 1.92s/it]			
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:28<00:00, 1.75s/it]		
	all	504	504	0.497	0.793
0.689	0.555				

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	38/499	1.13G	0.02614	0.009967	18
320: 100%	32/32	[01:04<00:00, 2.00s/it]			
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:26<00:00, 1.65s/it]		
	all	504	504	0.528	0.812
0.729	0.578				

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	39/499	1.13G	0.02583	0.00958	21
320: 100%	32/32	[01:00<00:00, 1.88s/it]			
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:26<00:00, 1.69s/it]		
	all	504	504	0.563	0.8
0.702	0.554				

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	40/499	1.13G	0.02577	0.009229	24
320: 100%	32/32	[01:02<00:00, 1.95s/it]			
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:27<00:00, 1.75s/it]		
	all	504	504	0.549	0.798

```

0.719      0.551
Epoch      GPU_mem    box_loss    obj_loss    cls_loss    Instances
Size
41/499      1.13G      0.02574    0.009842    0.04248      16
320: 100% 32/32 [01:02<00:00, 1.94s/it]
Class      Images    Instances    P      R
mAP50      mAP50-95: 100% 16/16 [00:25<00:00, 1.62s/it]
all        504      504      0.581    0.809
0.765      0.571

```

```

Epoch      GPU_mem    box_loss    obj_loss    cls_loss    Instances
Size
42/499      1.13G      0.02555    0.009411    0.04201      21
320: 100% 32/32 [01:01<00:00, 1.94s/it]
Class      Images    Instances    P      R
mAP50      mAP50-95: 100% 16/16 [00:28<00:00, 1.76s/it]
all        504      504      0.743    0.727
0.773      0.577

```

```

Epoch      GPU_mem    box_loss    obj_loss    cls_loss    Instances
Size
43/499      1.13G      0.02461    0.008848    0.0402      16
320: 100% 32/32 [01:01<00:00, 1.92s/it]
Class      Images    Instances    P      R
mAP50      mAP50-95: 100% 16/16 [00:29<00:00, 1.84s/it]
all        504      504      0.585    0.817
0.794      0.637

```

```

Epoch      GPU_mem    box_loss    obj_loss    cls_loss    Instances
Size
44/499      1.13G      0.0252     0.009274    0.04102      13
320: 100% 32/32 [00:59<00:00, 1.87s/it]
Class      Images    Instances    P      R
mAP50      mAP50-95: 100% 16/16 [00:28<00:00, 1.77s/it]
all        504      504      0.622    0.814
0.787      0.645

```

```

Epoch      GPU_mem    box_loss    obj_loss    cls_loss    Instances
Size
45/499      1.13G      0.02577    0.008867    0.03822      15
320: 100% 32/32 [01:02<00:00, 1.94s/it]
Class      Images    Instances    P      R
mAP50      mAP50-95: 100% 16/16 [00:28<00:00, 1.76s/it]
all        504      504      0.839    0.679
0.787      0.625

```

```

Epoch      GPU_mem    box_loss    obj_loss    cls_loss    Instances
Size
46/499      1.13G      0.0266     0.009596    0.04052      23

```



```

320: 100% 32/32 [01:01<00:00, 1.94s/it]
      Class      Images Instances      P      R
mAP50  mAP50-95: 100% 16/16 [00:27<00:00, 1.72s/it]
      all      504      504      0.725      0.754
0.796      0.627

```

```

      Epoch      GPU_mem      box_loss      obj_loss      cls_loss      Instances
Size
      47/499      1.13G      0.0258      0.009293      0.0408      22
320: 100% 32/32 [01:01<00:00, 1.93s/it]
      Class      Images Instances      P      R
mAP50  mAP50-95: 100% 16/16 [00:28<00:00, 1.77s/it]
      all      504      504      0.617      0.842
0.846      0.624

```

```

      Epoch      GPU_mem      box_loss      obj_loss      cls_loss      Instances
Size
      48/499      1.13G      0.02651      0.009528      0.03675      25
320: 100% 32/32 [01:03<00:00, 1.97s/it]
      Class      Images Instances      P      R
mAP50  mAP50-95: 100% 16/16 [00:27<00:00, 1.71s/it]
      all      504      504      0.758      0.819
0.838      0.657

```

```

      Epoch      GPU_mem      box_loss      obj_loss      cls_loss      Instances
Size
      49/499      1.13G      0.02517      0.009198      0.0378      25
320: 100% 32/32 [01:04<00:00, 2.03s/it]
      Class      Images Instances      P      R
mAP50  mAP50-95: 100% 16/16 [00:25<00:00, 1.60s/it]
      all      504      504      0.729      0.788
0.864      0.667

```

```

      Epoch      GPU_mem      box_loss      obj_loss      cls_loss      Instances
Size
      50/499      1.13G      0.02445      0.009128      0.03654      19
320: 100% 32/32 [01:02<00:00, 1.94s/it]
      Class      Images Instances      P      R
mAP50  mAP50-95: 100% 16/16 [00:27<00:00, 1.74s/it]
      all      504      504      0.767      0.828
0.88      0.716

```

```

      Epoch      GPU_mem      box_loss      obj_loss      cls_loss      Instances
Size
      51/499      1.13G      0.02606      0.009131      0.03357      18
320: 100% 32/32 [01:01<00:00, 1.92s/it]
      Class      Images Instances      P      R
mAP50  mAP50-95: 100% 16/16 [00:28<00:00, 1.76s/it]
      all      504      504      0.713      0.83
0.866      0.718

```

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	52/499	1.13G	0.02545	0.008878	0.03513	13
320:	100%	32/32	[01:00<00:00, 1.89s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:26<00:00, 1.63s/it]		
		all	504	504	0.814	0.851
0.902	0.728					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	53/499	1.13G	0.0254	0.0093	0.03565	17
320:	100%	32/32	[01:01<00:00, 1.93s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.72s/it]		
		all	504	504	0.781	0.835
0.878	0.723					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	54/499	1.13G	0.02553	0.009572	0.03444	16
320:	100%	32/32	[01:03<00:00, 1.98s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.73s/it]		
		all	504	504	0.761	0.89
0.902	0.698					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	55/499	1.13G	0.02463	0.009521	0.03389	17
320:	100%	32/32	[01:00<00:00, 1.88s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.71s/it]		
		all	504	504	0.78	0.894
0.895	0.729					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	56/499	1.13G	0.02511	0.009229	0.03322	20
320:	100%	32/32	[01:01<00:00, 1.93s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.70s/it]		
		all	504	504	0.768	0.893
0.905	0.712					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	57/499	1.13G	0.02588	0.009466	0.03235	19
320:	100%	32/32	[01:00<00:00, 1.88s/it]			

		Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:26<00:00, 1.66s/it]			
		all	504	504	0.765	0.919
0.909	0.754					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	58/499	1.13G	0.02474	0.009209	0.03213	21
320: 100%	32/32	[01:00<00:00, 1.90s/it]				
		Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:27<00:00, 1.71s/it]			
		all	504	504	0.774	0.836
0.878	0.67					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	59/499	1.13G	0.02462	0.009062	0.03221	18
320: 100%	32/32	[01:01<00:00, 1.92s/it]				
		Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:25<00:00, 1.57s/it]			
		all	504	504	0.812	0.886
0.923	0.765					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	60/499	1.13G	0.02516	0.009773	0.0326	18
320: 100%	32/32	[01:03<00:00, 1.98s/it]				
		Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:27<00:00, 1.72s/it]			
		all	504	504	0.755	0.903
0.908	0.72					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	61/499	1.13G	0.0237	0.009039	0.03153	22
320: 100%	32/32	[01:01<00:00, 1.93s/it]				
		Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:24<00:00, 1.54s/it]			
		all	504	504	0.811	0.926
0.926	0.741					
	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	62/499	1.13G	0.02458	0.009458	0.03186	26
320: 100%	32/32	[01:01<00:00, 1.91s/it]				
		Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:27<00:00, 1.72s/it]			
		all	504	504	0.827	0.91
0.935	0.73					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	63/499	1.13G	0.02438	0.008687	0.03124	19
320:	100% 32/32	[01:00<00:00, 1.90s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95:	100%	16/16	[00:26<00:00, 1.65s/it]		
	all		504	504	0.815	0.899
0.926	0.755					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	64/499	1.13G	0.02408	0.008815	0.03141	22
320:	100% 32/32	[00:59<00:00, 1.87s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.72s/it]		
	all		504	504	0.803	0.928
0.937	0.747					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	65/499	1.13G	0.02467	0.009097	0.03058	16
320:	100% 32/32	[01:01<00:00, 1.91s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95:	100%	16/16	[00:26<00:00, 1.67s/it]		
	all		504	504	0.813	0.943
0.921	0.778					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	66/499	1.13G	0.02473	0.008708	0.03034	17
320:	100% 32/32	[01:02<00:00, 1.97s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95:	100%	16/16	[00:25<00:00, 1.60s/it]		
	all		504	504	0.796	0.949
0.942	0.749					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	67/499	1.13G	0.02416	0.009211	0.0294	19
320:	100% 32/32	[01:01<00:00, 1.92s/it]				
	Class	Images	Instances	P	R	
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.70s/it]		
	all		504	504	0.857	0.953
0.943	0.787					

Size	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
	68/499	1.13G	0.02383	0.009172	0.02873	17
320:	100% 32/32	[01:00<00:00, 1.90s/it]				
	Class	Images	Instances	P	R	

mAP50	mAP50-95: 100%	16/16	[00:25<00:00,	1.57s/it]		
0.942	0.777	all	504	504	0.834	0.959

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	69/499	1.13G	0.02435	0.009201	14
320: 100%	32/32	[01:00<00:00,	1.90s/it]		
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:26<00:00,	1.68s/it]	
0.955	0.788	all	504	504	0.865

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	70/499	1.13G	0.02435	0.009083	23
320: 100%	32/32	[01:00<00:00,	1.90s/it]		
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:25<00:00,	1.56s/it]	
0.956	0.785	all	504	504	0.836

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	71/499	1.13G	0.02372	0.008788	15
320: 100%	32/32	[01:03<00:00,	1.99s/it]		
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:27<00:00,	1.70s/it]	
0.944	0.779	all	504	504	0.849

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	72/499	1.13G	0.02443	0.008925	16
320: 100%	32/32	[01:01<00:00,	1.92s/it]		
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:27<00:00,	1.75s/it]	
0.945	0.788	all	504	504	0.859

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	73/499	1.13G	0.0243	0.008869	20
320: 100%	32/32	[01:02<00:00,	1.95s/it]		
	Class	Images	Instances	P	R
mAP50	mAP50-95: 100%	16/16	[00:25<00:00,	1.58s/it]	
0.966	0.766	all	504	504	0.891

Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
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Size	74/499	1.13G	0.02468	0.008957	0.02615	24
320:	100%	32/32	[01:01<00:00, 1.93s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:27<00:00, 1.73s/it]		
		all	504	504	0.859	0.965
0.963	0.794					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	75/499	1.13G	0.02434	0.009062	0.02633	21
320:	100%	32/32	[01:02<00:00, 1.95s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:25<00:00, 1.60s/it]		
		all	504	504	0.904	0.923
0.958	0.815					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	76/499	1.13G	0.02392	0.009065	0.02688	18
320:	100%	32/32	[01:00<00:00, 1.88s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:31<00:00, 1.97s/it]		
		all	504	504	0.892	0.979
0.969	0.806					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	77/499	1.13G	0.02352	0.009107	0.02691	21
320:	100%	32/32	[01:01<00:00, 1.93s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	100%	16/16	[00:28<00:00, 1.78s/it]		
		all	504	504	0.888	0.975
0.972	0.82					

	Epoch	GPU_mem	box_loss	obj_loss	cls_loss	Instances
Size	78/499	1.13G	0.02476	0.009168	0.02454	18
320:	100%	32/32	[01:01<00:00, 1.92s/it]			
		Class	Images	Instances	P	R
mAP50	mAP50-95:	75%	12/16	[00:20<00:06, 1.67s/it]		

eval the model

```
from utils.plots import plot_results # plot results.txt as
results.png
Image(filename='/content/yolov5/runs/train/yolov5s_results/results.png', width=1000) # view results.png
```