

```
In [1]: # !pip install roboflow --user  
# !pip install ultralytics==8.0.196
```

```
Requirement already satisfied: roboflow in c:\users\shane\appdata\roaming\python\python310\site-packages (1.1.26)  
Requirement already satisfied: certifi==2023.7.22 in c:\users\shane\appdata\roaming\python\python310\site-packages (from roboflow) (2023.7.22)  
Requirement already satisfied: chardet==4.0.0 in c:\users\shane\appdata\roaming\python\python310\site-packages (from roboflow) (4.0.0)  
Requirement already satisfied: cycler==0.10.0 in c:\users\shane\appdata\roaming\python\python310\site-packages (from roboflow) (0.10.0)  
Requirement already satisfied: idna==2.10 in c:\users\shane\appdata\roaming\python\python310\site-packages (from roboflow) (2.10)  
Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (1.4.5)  
Requirement already satisfied: matplotlib in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (3.8.3)  
Requirement already satisfied: numpy>=1.18.5 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (1.26.2)  
Requirement already satisfied: opencv-python-headless==4.8.0.74 in c:\users\shane\appdata\roaming\python\python310\site-packages (from roboflow) (4.8.0.74)  
Requirement already satisfied: Pillow>=7.1.2 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (10.2.0)  
Requirement already satisfied: python-dateutil in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (2.8.2)  
Requirement already satisfied: python-dotenv in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (1.0.1)  
Requirement already satisfied: requests in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (2.31.0)  
Requirement already satisfied: six in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (1.16.0)  
Requirement already satisfied: urllib3>=1.26.6 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (2.1.0)  
Requirement already satisfied: tqdm>=4.41.0 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (4.66.1)  
Requirement already satisfied: PyYAML>=5.3.1 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (6.0.1)  
Requirement already satisfied: requests-toolbelt in c:\users\shane\appdata\roaming\python\python310\site-packages (from roboflow) (1.0.0)  
Requirement already satisfied: python-magic in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from roboflow) (0.4.27)  
Requirement already satisfied: colorama in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from tqdm>=4.41.0->roboflow) (0.4.6)  
Requirement already satisfied: contourpy>=1.0.1 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from matplotlib->roboflow) (1.2.0)  
Requirement already satisfied: fonttools>=4.22.0 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from matplotlib->roboflow) (4.49.0)  
Requirement already satisfied: packaging>=20.0 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from matplotlib->roboflow) (23.1)  
Requirement already satisfied: pyparsing>=2.3.1 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from matplotlib->roboflow) (3.1.2)  
Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\shane\anaconda3\envs\python3-10-build\lib\site-packages (from requests->roboflow) (3.3.2)
```

In [2]:

```
from roboflow import Roboflow
rf = Roboflow(api_key="BI1tQqHk4ASPaxB00Yf4")
project = rf.workspace("roboflow-gw7yv").project("raccoon")
dataset = project.version(38).download("yolov8")
```

loading Roboflow workspace...
loading Roboflow project...

WARNING Ultralytics settings reset to default values. This may be due to a possible problem with your settings or a recent ultralytics package update.
View settings with 'yolo settings' or at 'C:\Users\shane\AppData\Roaming\Ultralytics\settings.yaml'
Update settings with 'yolo settings key=value', i.e. 'yolo settings runs_dir=path/to/dir'.

```
In [3]: import os

dataset_path = 'Raccoon-38' # Adjust this to the path of your dataset

# List the directories within the dataset
for dirpath, dirnames, filenames in os.walk(dataset_path):
    print(f"Found directory: {dirpath}")
    for filename in filenames[:5]: # Just print the first 5 files for brevity
        print(f"  {filename}")
```

```
Found directory: Raccoon-38
  data.yaml
  README.dataset.txt
  README.roboflow.txt
Found directory: Raccoon-38\export
Found directory: Raccoon-38\export\images
  raccoon-100.jpg.rf.YWIftfgUdZqJLTkvI9W2.jpg
  raccoon-101.jpg.rf.ebfr15yC06H7KdSNWJKC.jpg
  raccoon-102.jpg.rf.Vtizg4N4D1Wn9fv4sBaJ.jpg
  raccoon-103.jpg.rf.yx4ScGFA2FZ23qfitAfV.jpg
  raccoon-104.jpg.rf.HdpZVmqlte04b2ny0HJO.jpg
Found directory: Raccoon-38\export\labels
  raccoon-100.jpg.rf.YWIftfgUdZqJLTkvI9W2.txt
  raccoon-101.jpg.rf.ebfr15yC06H7KdSNWJKC.txt
  raccoon-102.jpg.rf.Vtizg4N4D1Wn9fv4sBaJ.txt
  raccoon-103.jpg.rf.yx4ScGFA2FZ23qfitAfV.txt
  raccoon-104.jpg.rf.HdpZVmqlte04b2ny0HJO.txt
Found directory: Raccoon-38\test
Found directory: Raccoon-38\test\images
  raccoon-57.jpg.rf.26f3fae218f26088f6a7405c58ae8020.jpg
  raccoon-58.jpg.rf.ff9de9977475e0086e7ab582122c5167.jpg
  raccoon-59.jpg.rf.388d6dd8c9d5a6fc7ca75790e680c269.jpg
  raccoon-60.jpg.rf.cff8b797e6b5c9b716b6be70be2b6b33.jpg
  raccoon-61.jpg.rf.58c4f561336525f59d395ce21508523b.jpg
Found directory: Raccoon-38\test\labels
  raccoon-57.jpg.rf.26f3fae218f26088f6a7405c58ae8020.txt
  raccoon-58.jpg.rf.ff9de9977475e0086e7ab582122c5167.txt
  raccoon-59.jpg.rf.388d6dd8c9d5a6fc7ca75790e680c269.txt
  raccoon-60.jpg.rf.cff8b797e6b5c9b716b6be70be2b6b33.txt
  raccoon-61.jpg.rf.58c4f561336525f59d395ce21508523b.txt
Found directory: Raccoon-38\train
Found directory: Raccoon-38\train\images
  raccoon-100.jpg.rf.e9338202a924dc489ffd94e0291a0f39.jpg
  raccoon-101.jpg.rf.a9e8a95f51d60d7d3b40d3243aa11afdf.jpg
  raccoon-102.jpg.rf.d140a1fcfc8d62c7ad37167714f79df.jpg
  raccoon-103.jpg.rf.7148e5c7d785760fe9cb6b7762180977.jpg
  raccoon-104.jpg.rf.e5f8de5f977a32d8a7f2223574ff2b72.jpg
Found directory: Raccoon-38\train\labels
  raccoon-100.jpg.rf.e9338202a924dc489ffd94e0291a0f39.txt
  raccoon-101.jpg.rf.a9e8a95f51d60d7d3b40d3243aa11afdf.txt
  raccoon-102.jpg.rf.d140a1fcfc8d62c7ad37167714f79df.txt
  raccoon-103.jpg.rf.7148e5c7d785760fe9cb6b7762180977.txt
  raccoon-104.jpg.rf.e5f8de5f977a32d8a7f2223574ff2b72.txt
Found directory: Raccoon-38\valid
Found directory: Raccoon-38\valid\images
  raccoon-73.jpg.rf.8b19ae0bb7646bcaac6f8df04aee44d6.jpg
  raccoon-74.jpg.rf.f659e9e55813f64171049e9f03ed6f11.jpg
  raccoon-75.jpg.rf.5e193e4f8bf7f785e771f8fdc819cd33.jpg
  raccoon-76.jpg.rf.18108811a0eff493af52df8999de85f0.jpg
  raccoon-77.jpg.rf.638583ea08f3043d3691359e149f59c2.jpg
Found directory: Raccoon-38\valid\labels
  raccoon-73.jpg.rf.8b19ae0bb7646bcaac6f8df04aee44d6.txt
  raccoon-74.jpg.rf.f659e9e55813f64171049e9f03ed6f11.txt
  raccoon-75.jpg.rf.5e193e4f8bf7f785e771f8fdc819cd33.txt
  raccoon-76.jpg.rf.18108811a0eff493af52df8999de85f0.txt
  raccoon-77.jpg.rf.638583ea08f3043d3691359e149f59c2.txt
```

```
In [5]: with open(os.path.join(dataset_path, 'data.yaml'), 'r') as file:  
    print(file.read())
```

```
names:  
- raccoon  
nc: 1  
roboflow:  
    license: MIT  
    project: raccoon  
    url: https://universe.roboflow.com/roboflow-gw7yv/raccoon/dataset/38 (http  
s://universe.roboflow.com/roboflow-gw7yv/raccoon/dataset/38)  
    version: 38  
    workspace: roboflow-gw7yv  
test: ../test/images  
train: Raccoon-38/train/images  
val: Raccoon-38/valid/images
```

```
In [7]: import os  
  
# Print the current working directory  
print("Current Working Directory:", os.getcwd())  
  
# Set or correct the dataset_path variable  
dataset_path = 'Raccoon-38' # Adjust based on your setup  
print("Dataset Path:", dataset_path)
```

```
Current Working Directory: C:\Users\shane\object-detect-main - Copy  
Dataset Path: Raccoon-38
```

```
In [8]: # List files in the specified directory to verify the image file's presence  
image_directory = os.path.join(dataset_path, 'train/images')  
print(f"Listing files in {image_directory}:\n")  
!dir "{image_directory}" # For Windows
```

```
Listing files in Raccoon-38\train\images:
```

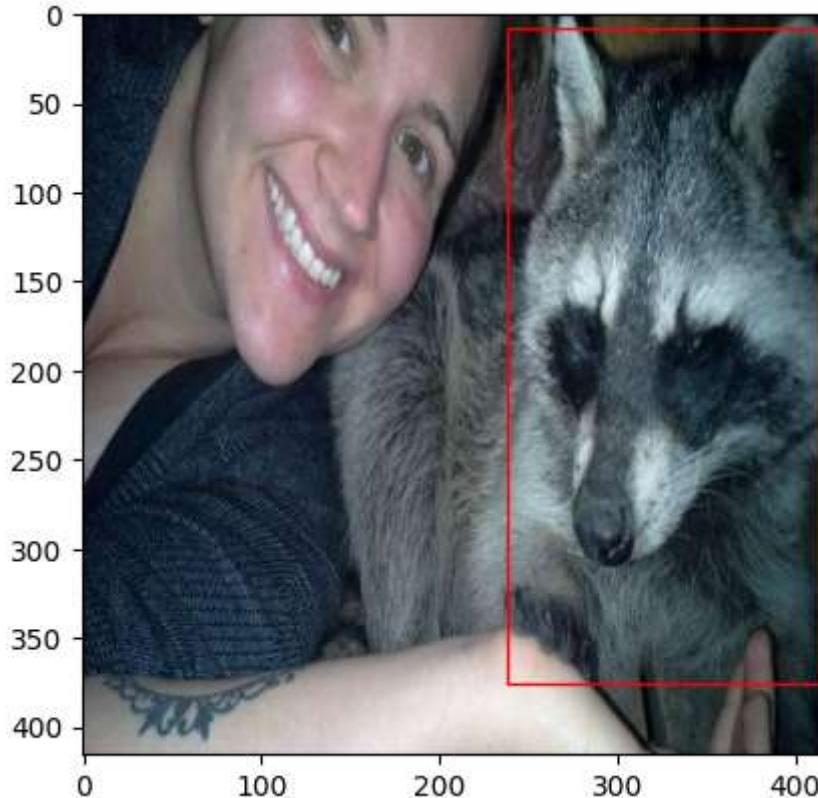
```
Volume in drive C has no label.  
Volume Serial Number is DEB0-8041
```

```
Directory of C:\Users\shane\object-detect-main - Copy\Raccoon-38\train\ima  
ges
```

```
2024-04-07 05:59 PM <DIR> .  
2024-04-07 05:59 PM <DIR> ..  
2024-04-07 05:59 PM 29,260 raccoon-100.jpg.rf.e9338202a924dc489  
ffd94e0291a0f39.jpg  
2024-04-07 05:59 PM 34,570 raccoon-101.jpg.rf.a9e8a95f51d60d7d3  
b40d3243aa11afdf.jpg  
2024-04-07 05:59 PM 30,824 raccoon-102.jpg.rf.d140a1fcfc8d62c7  
ad37167714f79df.jpg  
2024-04-07 05:59 PM 45,941 raccoon-103.jpg.rf.7148e5c7d785760fe  
9cb6b7762180977.jpg  
2024-04-07 05:59 PM 19,239 raccoon-104.jpg.rf.e5f8de5f977a32d8a  
racoon-105.jpg
```

```
In [9]: image_filename = 'raccoon-100.jpg.rf.e9338202a924dc489ffd94e0291a0f39.jpg' # O
image_path = os.path.join('Raccoon-38', 'train/images', image_filename)
label_path = os.path.join('Raccoon-38', 'train/labels', image_filename.replace('.jpg', '.txt'))

display_image_with_boxes(image_path, label_path)
```



```
In [23]: from ultralytics import YOLO
```

In [37]: `model = YOLO("yolov8s.yaml")`

	from	n	params	module
arguments				
0	-1	1	928	ultralytics.nn.modules.conv.Conv
[3, 32, 3, 2]				
1	-1	1	18560	ultralytics.nn.modules.conv.Conv
[32, 64, 3, 2]				
2	-1	1	29056	ultralytics.nn.modules.block.C2f
[64, 64, 1, True]				
3	-1	1	73984	ultralytics.nn.modules.conv.Conv
[64, 128, 3, 2]				
4	-1	2	197632	ultralytics.nn.modules.block.C2f
[128, 128, 2, True]				
5	-1	1	295424	ultralytics.nn.modules.conv.Conv
[128, 256, 3, 2]				
6	-1	2	788480	ultralytics.nn.modules.block.C2f
[256, 256, 2, True]				
7	-1	1	1180672	ultralytics.nn.modules.conv.Conv
[256, 512, 3, 2]				
8	-1	1	1838080	ultralytics.nn.modules.block.C2f
[512, 512, 1, True]				
9	-1	1	656896	ultralytics.nn.modules.block.SPPF
[512, 512, 5]				
10	-1	1	0	torch.nn.modules.upsampling.Upsample
[None, 2, 'nearest']				
11	[-1, 6]	1	0	ultralytics.nn.modules.conv.Concat
[1]				
12	-1	1	591360	ultralytics.nn.modules.block.C2f
[768, 256, 1]				
13	-1	1	0	torch.nn.modules.upsampling.Upsample
[None, 2, 'nearest']				
14	[-1, 4]	1	0	ultralytics.nn.modules.conv.Concat
[1]				
15	-1	1	148224	ultralytics.nn.modules.block.C2f
[384, 128, 1]				
16	-1	1	147712	ultralytics.nn.modules.conv.Conv
[128, 128, 3, 2]				
17	[-1, 12]	1	0	ultralytics.nn.modules.conv.Concat
[1]				
18	-1	1	493056	ultralytics.nn.modules.block.C2f
[384, 256, 1]				
19	-1	1	590336	ultralytics.nn.modules.conv.Conv
[256, 256, 3, 2]				
20	[-1, 9]	1	0	ultralytics.nn.modules.conv.Concat
[1]				
21	-1	1	1969152	ultralytics.nn.modules.block.C2f
[768, 512, 1]				
22	[15, 18, 21]	1	2147008	ultralytics.nn.modules.head.Detect
[80, [128, 256, 512]]				
YOLOv8s summary: 225 layers, 11166560 parameters, 11166544 gradients, 28.8 GFLOPs				

In [36]: # Use the model

```
model.train(data="C:/Users/shane/object-detect-main - Copy/Raccoon-38/data.yaml")
metrics = model.val() # evaluate model performance on the validation set
results = model("C:/Users/shane/object-detect-main - Copy/Raccoon-38/test/images")
path = model.export(format="onnx") # export the model to ONNX format

print("Training complete.")
print("Validation metrics:", metrics)
print("Prediction results:", results)
print("Model exported to:", path)
```

New <https://pypi.org/project/ultralytics/8.1.45> (<https://pypi.org/project/ultralytics/8.1.45>) available Update with 'pip install -U ultralytics'
 Ultralytics YOLOv8.0.196 Python-3.10.13 torch-2.2.1+cpu CPU (Intel Core(TM) i7-4790K 4.00GHz)

engine\trainer: task=detect, mode=train, model=yolov8s.yaml, data=C:/Users/shane/object-detect-main - Copy/Raccoon-38/data.yaml, epochs=3, patience=50, batch=16, imgsz=640, save=True, save_period=-1, cache=False, device=None, workers=8, project=None, name=None, exist_ok=False, pretrained=True, optimizer=auto, verbose=True, seed=0, deterministic=True, single_cls=False, rect=False, cosine_lr=False, close_mosaic=10, resume=False, amp=True, fraction=1.0, profile=False, freeze=None, overlap_mask=True, mask_ratio=4, dropout=0.0, val=True, split=val, save_json=False, save_hybrid=False, conf=None, iou=0.7, max_det=300, half=False, dnn=False, plots=True, source=None, show=False, save_txt=False, save_conf=False, save_crop=False, show_labels=True, show_conf=True, vid_stride=1, stream_buffer=False, line_width=None, visualize=False, augment=False, agnostic_nms=False, classes=None, retina_masks=False, boxes=True, format=torchscript, keras=False, optimize=False, int8=False, dynamic=False, simplify=False, opset=None, workspace=4, nms=False, 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=7.5, cls=0.5, df1=1.5, pose=12.0, kobj=1.0, label_smoothing=0.0, nbs=64, 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, cfg=None, tracker=botsort.yaml, save_dir=runs\detect\train6

	from	n	params	module
arguments				
0	-1	1	928	ultralytics.nn.modules.conv.Conv
[3, 32, 3, 2]				
1	-1	1	18560	ultralytics.nn.modules.conv.Conv
[32, 64, 3, 2]				
2	-1	1	29056	ultralytics.nn.modules.block.C2f
[64, 64, 1, True]				
3	-1	1	73984	ultralytics.nn.modules.conv.Conv
[64, 128, 3, 2]				
4	-1	2	197632	ultralytics.nn.modules.block.C2f
[128, 128, 2, True]				
5	-1	1	295424	ultralytics.nn.modules.conv.Conv
[128, 256, 3, 2]				
6	-1	2	788480	ultralytics.nn.modules.block.C2f
[256, 256, 2, True]				
7	-1	1	1180672	ultralytics.nn.modules.conv.Conv
[256, 512, 3, 2]				
8	-1	1	1838080	ultralytics.nn.modules.block.C2f
[512, 512, 1, True]				
9	-1	1	656896	ultralytics.nn.modules.block.SPPF
[512, 512, 5]				
10	-1	1	0	torch.nn.modules.upsampling.Upsample
[None, 2, 'nearest']				
11	[-1, 6]	1	0	ultralytics.nn.modules.conv.Concat
[1]				
12	-1	1	591360	ultralytics.nn.modules.block.C2f
[768, 256, 1]				
13	-1	1	0	torch.nn.modules.upsampling.Upsample
[None, 2, 'nearest']				
14	[-1, 4]	1	0	ultralytics.nn.modules.conv.Concat
[1]				
15	-1	1	148224	ultralytics.nn.modules.block.C2f

```
[384, 128, 1]
 16           -1  1    147712 ultralytics.nn.modules.conv.Conv
[128, 128, 3, 2]
 17      [-1, 12]  1        0 ultralytics.nn.modules.conv.Concat
[1]
 18           -1  1    493056 ultralytics.nn.modules.block.C2f
[384, 256, 1]
 19           -1  1    590336 ultralytics.nn.modules.conv.Conv
[256, 256, 3, 2]
 20      [-1, 9]  1        0 ultralytics.nn.modules.conv.Concat
[1]
 21           -1  1   1969152 ultralytics.nn.modules.block.C2f
[768, 512, 1]
 22     [15, 18, 21]  1   2116435 ultralytics.nn.modules.head.Detect
[1, [128, 256, 512]]
YOLOv8s summary: 225 layers, 11135987 parameters, 11135971 gradients, 28.6 GF
LOPs
```

TensorBoard: Start with 'tensorboard --logdir runs\detect\train6', view at <http://localhost:6006/> (<http://localhost:6006/>)
Freezing layer 'model.22.dfl.conv.weight'
train: Scanning C:\Users\shane\object-detect-main - Copy\Raccoon-38\train\labels.cache... 150 images, 0 backgrounds, 0 corrupt: 100%|██████████| 150/150 [00:00<?, ?it/s]
val: Scanning C:\Users\shane\object-detect-main - Copy\Raccoon-38\valid\labels.cache... 29 images, 0 backgrounds, 0 corrupt: 100%|██████████| 29/29 [00:00 <?, ?it/s]
Plotting labels to runs\detect\train6\labels.jpg...
optimizer: 'optimizer=auto' found, ignoring 'lr0=0.01' and 'momentum=0.937' and determining best 'optimizer', 'lr0' and 'momentum' automatically...
optimizer: AdamW(lr=0.002, momentum=0.9) with parameter groups 57 weight(decay=0.0), 64 weight(decay=0.0005), 63 bias(decay=0.0)
Image sizes 640 train, 640 val
Using 0 dataloader workers
Logging results to runs\detect\train6
Starting training for 3 epochs...

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
1/3	0G	3.03	3.433	4.208	19	64
0: 100% ██████████ 10/10 [02:58<00:00, 17.89s/it]						
	Class	Images	Instances	Box(P)	R	mAP50
mAP50-95): 100% ██████████ 1/1 [00:12<00:00, 12.11s/it]						
	all	29	29	0.00333	1	0.0387
0.0144						

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
2/3	0G	3.185	3.452	4.146	13	64
0: 100% ██████████ 10/10 [02:38<00:00, 15.84s/it]						
	Class	Images	Instances	Box(P)	R	mAP50
mAP50-95): 100% ██████████ 1/1 [00:11<00:00, 11.68s/it]						
	all	29	29	0.00333	1	0.101
0.0284						

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
3/3	0G	2.945	3.324	4.089	9	64
0: 100% ██████████ 10/10 [02:39<00:00, 15.98s/it]						
	Class	Images	Instances	Box(P)	R	mAP50

```
mAP50-95): 100%|██████████| 1/1 [00:11<00:00, 11.39s/it]
all           29           29      0.00333      1      0.227
0.0539
```

3 epochs completed in 0.150 hours.

Optimizer stripped from runs\detect\train6\weights\last.pt, 22.5MB
Optimizer stripped from runs\detect\train6\weights\best.pt, 22.5MB

Validating runs\detect\train6\weights\best.pt...

Ultralytics YOLOv8.0.196 Python-3.10.13 torch-2.2.1+cpu CPU (Intel Core(TM) i7-4790K 4.00GHz)

YOLOv8s summary (fused): 168 layers, 11125971 parameters, 0 gradients, 28.4 G FLOPs

	Class	Images	Instances	Box(P)	R	mAP50
mAP50-95): 100%	██████████	1/1	[00:10<00:00, 10.30s/it]			
	all	29	29	0.00333	1	0.259

0.0546

Speed: 2.8ms preprocess, 339.6ms inference, 0.0ms loss, 4.5ms postprocess per image

Results saved to runs\detect\train6

Ultralytics YOLOv8.0.196 Python-3.10.13 torch-2.2.1+cpu CPU (Intel Core(TM) i7-4790K 4.00GHz)

YOLOv8s summary (fused): 168 layers, 11125971 parameters, 0 gradients, 28.4 G FLOPs

val: Scanning C:\Users\shane\object-detect-main - Copy\Raccoon-38\valid\labels.cache... 29 images, 0 backgrounds, 0 corrupt: 100%|██████████| 29/29 [00:00 <, ?it/s]

	Class	Images	Instances	Box(P)	R	mAP50
mAP50-95): 100%	██████████	2/2	[00:10<00:00, 5.02s/it]			
	all	29	29	0.00333	1	0.259

0.0546

Speed: 3.8ms preprocess, 326.0ms inference, 0.0ms loss, 5.0ms postprocess per image

Results saved to runs\detect\val

```
image 1/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-57.jpg.rf.26f3fae218f26088f6a7405c58ae8020.jpg: 640x640 (no detection s), 336.0ms
image 2/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-58.jpg.rf.ff9de9977475e0086e7ab582122c5167.jpg: 640x640 (no detection s), 296.6ms
image 3/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-59.jpg.rf.388d6dd8c9d5a6fc7ca75790e680c269.jpg: 640x640 (no detection s), 301.4ms
image 4/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-60.jpg.rf.cff8b797e6b5c9b716b6be70be2b6b33.jpg: 640x640 (no detection s), 313.9ms
image 5/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-61.jpg.rf.58c4f561336525f59d395ce21508523b.jpg: 640x640 (no detection s), 289.9ms
image 6/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-62.jpg.rf.e997ede5457f069436178f08065d9a61.jpg: 640x640 (no detection s), 320.6ms
image 7/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-63.jpg.rf.1b33356e79739a8a1f3676a9f4f9f97a.jpg: 640x640 (no detection s), 282.2ms
image 8/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-64.jpg.rf.5201bb870708d051100bbbb8c148ecd2.jpg: 640x640 (no detection s), 309.1ms
image 9/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-66.jpg.rf.447ffe6a6b6cd768de213288bb000418.jpg: 640x640 (no detection s), 286.1ms
image 10/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-67.jpg.rf.626d83ff044dd4e2b37cbf4b4178eb89.jpg: 640x640 (no detection s), 309.1ms
image 11/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-68.jpg.rf.f307e4242845e8e03c27271f5b381eb0.jpg: 640x640 (no detection s), 284.2ms
image 12/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-69.jpg.rf.87d4a574d6f7ab57f5fc39620df291f9.jpg: 640x640 (no detection s), 293.8ms
image 13/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-6.jpg.rf.e1ef482779f9ef651ec62ed3a9c1e2d7.jpg: 640x640 (no detection s), 313.9ms
image 14/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-70.jpg.rf.a6800b2698e4aed694cc0c0c8c866909.jpg: 640x640 (no detection s), 315.8ms
image 15/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-71.jpg.rf.a66c60622f34ad56ff13e712485800ce.jpg: 640x640 (no detection s), 309.1ms
image 16/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-72.jpg.rf.8179b0a10f21dc1424a7ad48d8ef22f3.jpg: 640x640 (no detection s), 295.7ms
image 17/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-7.jpg.rf.23286e3ec911b9f6f22c5153d60ec808.jpg: 640x640 (no detection s), 320.6ms
Speed: 4.6ms preprocess, 304.6ms inference, 0.9ms postprocess per image at shape (1, 3, 640, 640)
Ultralytics YOLOv8.0.196 Python-3.10.13 torch-2.2.1+cpu CPU (Intel Core(TM) i7-4790K 4.00GHz)
```

PyTorch: starting from 'runs\detect\train6\weights\best.pt' with input shape (1, 3, 640, 640) BCHW and output shape(s) (1, 5, 8400) (21.5 MB)

ONNX: starting export with onnx 1.15.0 opset 17...

ONNX: export success 2.4s, saved as 'runs\detect\train6\weights\best.onnx' (42.6 MB)

Export complete (4.7s)

Results saved to C:\Users\shane\object-detect-main - Copy\ultralytics\runs\detect\train6\weights

Predict: yolo predict task=detect model=runs\detect\train6\weights\best.onnx imgs=640

Validate: yolo val task=detect model=runs\detect\train6\weights\best.onnx imgs=640 data=C:/Users/shane/object-detect-main - Copy/Raccoon-38/data.yaml

Visualize: <https://netron.app> (<https://netron.app>)

Training complete.

Validation metrics: ultralytics.utils.metrics.DetMetrics object with attributes:

```
ap_class_index: array([0])
box: ultralytics.utils.metrics.Metric object
confusion_matrix: <ultralytics.utils.metrics.ConfusionMatrix object at 0x000001EF5947A0E0>
fitness: 0.07502254396573405
keys: ['metrics/precision(B)', 'metrics/recall(B)', 'metrics/mAP50(B)', 'metrics/mAP50-95(B)']
maps: array([ 0.054619])
names: {0: 'raccoon'}
plot: True
results_dict: {'metrics/precision(B)': 0.003333333333333335, 'metrics/recall(B)': 1.0, 'metrics/mAP50(B)': 0.25865630329393213, 'metrics/mAP50-95(B)': 0.05461879292926759, 'fitness': 0.07502254396573405}
save_dir: WindowsPath('runs/detect/val')
speed: {'preprocess': 3.7738043686439253, 'inference': 325.97033730868634, 'loss': 0.0, 'postprocess': 4.965461533645104}
Prediction results: [ultralytics.engine.results.Results object with attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
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   [ 50,  61,  75],
   [ 57,  67,  84],
   [ 57,  67,  84]],

[[ 34,  93,  85],
   [ 32,  91,  83],
   [ 30,  88,  83],
   ...,
   [ 38,  49,  63],
   [ 44,  54,  71],
   [ 43,  53,  70]],

[[ 34,  93,  85],
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   ...,
   [ 36,  47,  61],
   [ 43,  54,  68],
   [ 44,  55,  69]],

...,

[[109, 112, 110],
   [110, 113, 111],
   [109, 114, 113],
   ...,
```

```
[ 23,  27,  28],  
[ 36,  40,  41],  
[ 57,  61,  62]],  
  
[[109, 113, 108],  
 [108, 112, 107],  
 [106, 111, 109],  
 ...,  
 [ 15,  19,  20],  
 [ 11,  15,  16],  
 [ 25,  29,  30]],  
  
[[105, 109, 104],  
 [103, 107, 102],  
 [101, 106, 104],  
 ...,  
 [ 49,  53,  54],  
 [ 29,  33,  34],  
 [ 10,  14,  15]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-57.jpg.rf.26f3fae218f26088f6a7405c58ae8020.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 4.800558090209961, 'inference': 336.0002040863037, 'postprocess': 0.9603500366210938}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [233, 238, 237],  
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     [233, 238, 237],  
     ...,  
     [244, 246, 246],  
     [244, 246, 246],  
     [244, 246, 246]],  
  
[[233, 238, 237],  
 [233, 238, 237],  
 [233, 238, 237],  
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 [244, 246, 246],  
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 [244, 246, 246]],  
  
[[233, 238, 237],  
 [233, 238, 237],  
 [233, 238, 237],  
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 [244, 246, 246],  
 [244, 246, 246],  
 [244, 246, 246]],  
  
...,
```

```
[[ 34, 114, 191],  
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 [ 37, 117, 194],  
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 [ 49, 114, 182],  
 [ 47, 112, 180],  
 [ 43, 108, 176]],  
  
[[ 19, 96, 175],  
 [ 21, 98, 177],  
 [ 25, 102, 181],  
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 [ 46, 106, 176],  
 [ 47, 109, 179],  
 [ 45, 107, 177]],  
  
[[ 6, 83, 162],  
 [ 9, 86, 165],  
 [ 14, 91, 170],  
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 [ 39, 98, 168],  
 [ 45, 105, 175],  
 [ 44, 104, 174]]], dtype=uint8)  
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path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-58.jpg.rf.ff9de9977475e0086e7ab582122c5167.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 4.800319671630859, 'inference': 296.64087295532227, 'postprocess': 0.9596347808837891}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
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[[222, 239, 242],  
 [222, 239, 242],  
 [222, 239, 242],  
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 [242, 244, 245],  
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 [242, 244, 245]],  
  
[[222, 239, 242],  
 [222, 239, 242],  
 [222, 239, 242],  
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```
[242, 244, 245],  
[242, 244, 245],  
[242, 244, 245]],  
  
...,  
  
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 [ 46, 104, 180],  
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 [ 76, 148, 208],  
 [ 76, 148, 208]],  
  
[[ 38,  97, 176],  
 [ 42, 102, 178],  
 [ 43, 103, 179],  
 ...,  
 [ 76, 143, 200],  
 [ 75, 143, 202],  
 [ 76, 144, 203]],  
  
[[ 41, 100, 179],  
 [ 43, 103, 179],  
 [ 43, 103, 179],  
 ...,  
 [ 72, 137, 192],  
 [ 70, 137, 194],  
 [ 71, 138, 195]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-59.jpg.rf.388d6dd8c9d5a6fc7ca75790e680c269.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 4.800319671630859, 'inference': 301.4407157897949, 'postprocess': 0.9596347808837891}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
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     [ 97, 104, 107],  
     ...,  
     [ 81,  92, 100],  
     [ 92, 103, 111],  
     [ 97, 108, 116]],  
  
[[ 85,  92,  95],  
 [ 95, 102, 105],  
 [ 98, 105, 108],  
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 [ 88,  99, 107],  
 [ 93, 104, 112],  
 [ 93, 104, 112]]],
```

```
[[ 96, 103, 106],
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 [[ 77,  88,  96],
 [ 86,  97, 105],
 [ 89, 100, 108]],

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 [[ 26,  40,  38],
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 [ 26,  40,  38],
 ...,
 [[ 26,  40,  39],
 [ 26,  40,  39],
 [ 26,  40,  39]],

 [[ 26,  40,  38],
 [ 26,  40,  38],
 [ 26,  40,  38],
 ...,
 [[ 26,  40,  39],
 [ 26,  40,  39],
 [ 26,  40,  39]],

 [[ 26,  40,  38],
 [ 26,  40,  38],
 [ 26,  40,  38],
 ...,
 [[ 26,  40,  39],
 [ 26,  40,  39],
 [ 26,  40,  39]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-60.jpg.rf.cff8b797e6b5c9b716b6be70be2b6b33.jpg'
probs: None
save_dir: None
speed: {'preprocess': 5.76019287109375, 'inference': 313.9214515686035, 'post process': 1.918792724609375}, ultralytics.engine.results.Results object with attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[ [ 29,  77,  29],
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 [[ 39,  58,  25],
 [ 50,  67,  33],
 [ 60,  77,  43]],

 [[ 30,  78,  30],
 [ 24,  72,  24],
```

```
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...,  
  
[[ 89,  87,  87],  
[ 88,  86,  86],  
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[ 90, 140,  92],  
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[[ 78,  76,  76],  
[ 76,  74,  74],  
[ 76,  74,  74],  
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[ 56,  94,  58],  
[ 83, 136,  86],  
[103, 162, 104]],  
  
[[ 76,  74,  74],  
[ 74,  72,  72],  
[ 74,  72,  72],  
...,  
[ 48,  86,  50],  
[ 81, 134,  84],  
[105, 164, 106]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-61.jpg.rf.58c4f561336525f59d395ce21508523b.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 6.720542907714844, 'inference': 289.9198532104492, 'postprocess': 0.0}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [220, 166, 135],  
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[ 94, 111, 138],  
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```
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 [ 83, 97, 125],
 [111, 126, 152]],

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 ...,
 [ 99, 115, 144],
 [ 77, 91, 119],
 [115, 129, 157]],

...,

[[129, 126, 135],
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 [191, 212, 250],
 [ 45, 62, 101]],

[[231, 227, 233],
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 [ 98, 96, 102],
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 [ 51, 66, 105]],

[[131, 127, 133],
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 [193, 212, 250],
 [ 61, 76, 115]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-62.jpg.rf.e997ede5457f069436178f08065d9a61.jpg'
probs: None
save_dir: None
speed: {'preprocess': 3.8404464721679688, 'inference': 320.64080238342285, 'postprocess': 0.9596347808837891}, ultralytics.engine.results.Results object with attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
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```

```
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[ 6, 78, 65]],  
  
[[212, 189, 193],  
[222, 199, 203],  
[207, 185, 187],  
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[ 55, 126, 110],  
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[[193, 198, 207],  
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[162, 164, 175],  
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[ 31, 52, 37]],  
  
[[169, 175, 182],  
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[ 47, 70, 55],  
[ 47, 69, 51],  
[ 46, 65, 48]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-63.jpg.rf.1b33356e79739a8a1f3676a9f4f9f97a.jpg'  
probs: None  
save_dir: None  
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```

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boxes: ultralytics.engine.results.Boxes object
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masks: None
names: {0: 'raccoon'}
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   [ 57,  59,  83]],

  [[163, 147, 148],
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   [163, 147, 148],
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   [ 58,  60,  84],
   [ 57,  59,  83]],

  [[163, 147, 148],
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   [ 58,  60,  84],
   [ 57,  59,  83]],

  ...,

  [[ 31,  32,  42],
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   [145,  51,  22],
   [143,  49,  20]],

  [[ 31,  32,  42],
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   [ 26,  27,  37],
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   [147,  50,  22],
   [146,  49,  21]],

  [[ 34,  35,  45],
   [ 36,  37,  47],
   [ 27,  28,  38],
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   [150,  51,  23],
   [148,  49,  21]]], dtype=uint8)
orig_shape: (416, 416)
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probs: None
```

```
save_dir: None
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boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[[ 84, 110, 127],
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   [ 65, 99, 115]],

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   [ 64, 97, 113]],

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   [ 71, 95, 119],
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   [ 76, 100, 124]],

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   [ 59, 76, 89],
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   [ 69, 93, 117],
   [ 70, 94, 118],
   [ 76, 100, 124]],

   [[ 62, 78, 91],
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   [ 60, 77, 90],
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   [ 64, 88, 112],
   [ 72, 96, 120],
```

```
[ 82, 106, 130]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images
\\\\raccoon-66.jpg.rf.447ffe6a6b6cd768de213288bb000418.jpg'
probs: None
save_dir: None
speed: {'preprocess': 3.8421154022216797, 'inference': 286.07869148254395, 'postprocess': 0.9598731994628906}, ultralytics.engine.results.Results object with attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
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   [ 43,  73,  84],
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   [ 40, 113,  81],
   [ 40, 114,  80]],

   [[ 45,  75,  86],
   [ 44,  74,  85],
   [ 43,  73,  84],
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   [ 48, 118,  87],
   [ 36, 109,  77],
   [ 27, 101,  67]],

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   [ 45,  73,  84],
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   [ 43, 116,  84],
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   ...,

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   [ 61, 106,  87]],

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   ...,
   [ 57,  99,  82],
   [ 59, 104,  85],
   [ 62, 107,  88]],

   [[112, 137, 163],
```

```
[115, 140, 166],  
[115, 140, 166],  
...,  
[ 57,  99,  82],  
[ 59, 104,  85],  
[ 62, 107,  88]]], dtype=uint8)  
orig_shape: (416, 416)  
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probs: None  
save_dir: None  
speed: {'preprocess': 3.8421154022216797, 'inference': 309.11874771118164, 'postprocess': 0.9596347808837891}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[[ 14,  24,  24],  
    [ 14,  24,  24],  
    [ 14,  24,  24],  
    ...,  
    [ 25,  30,  29],  
    [ 26,  31,  30],  
    [ 26,  31,  30]],  
  
    [[ 14,  24,  24],  
    [ 14,  24,  24],  
    [ 14,  24,  24],  
    ...,  
    [ 25,  30,  29],  
    [ 26,  31,  30],  
    [ 26,  31,  30]],  
  
    [[ 14,  24,  24],  
    [ 14,  24,  24],  
    [ 14,  24,  24],  
    ...,  
    [ 25,  30,  29],  
    [ 26,  31,  30],  
    [ 26,  31,  30]],  
  
    ...,  
  
    [[ 30,  46,  62],  
    [ 53,  69,  85],  
    [ 66,  81,  97],  
    ...,  
    [ 11,  15,  16],  
    [ 10,  14,  15],  
    [  9,  13,  14]],  
  
    [[ 23,  39,  55],  
    [ 56,  72,  88],  
    [ 66,  81,  97],  
    ...]
```

```
[ 7, 11, 12],
[ 8, 12, 13],
[ 9, 13, 14]],

[[ 45, 61, 77],
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[ 72, 87, 103],
...,
[ 4, 8, 9],
[ 6, 10, 11],
[ 9, 13, 14]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images
\\\\raccoon-68.jpg.rf.f307e4242845e8e03c27271f5b381eb0.jpg'
probs: None
save_dir: None
speed: {'preprocess': 4.801750183105469, 'inference': 284.15870666503906, 'po
stprocess': 0.9598731994628906}, ultralytics.engine.results.Results object wi
th attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[ [ 54, 56, 56],
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[ 82, 77, 76]],

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[ 77, 79, 79],
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[105, 100, 99],
[ 78, 73, 72],
[ 78, 73, 72]],

[[ 61, 63, 63],
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...,
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[ 84, 79, 78],
[ 82, 77, 76]],

...,

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[ 57, 62, 61]]],
```

```
[[137, 139, 139],  
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 [ 69,  74,  73]],  
  
[[138, 140, 140],  
 [134, 136, 136],  
 [131, 133, 133],  
 ...,  
 [105, 110, 109],  
 [ 77,  82,  81],  
 [ 76,  81,  80]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-69.jpg.rf.87d4a574d6f7ab57f5fc39620df291f9.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 3.840923309326172, 'inference': 293.7610149383545, 'postprocess': 0.9593963623046875}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [0, 0, 0],  
 [0, 0, 0],  
 ...,  
 [0, 0, 0],  
 [0, 0, 0],  
 [0, 0, 0]],  
  
 [[0, 0, 0],  
 [0, 0, 0],  
 [0, 0, 0],  
 ...,  
 [0, 0, 0],  
 [0, 0, 0],  
 [0, 0, 0]],  
  
 [[0, 0, 0],  
 [0, 0, 0],  
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 ...,  
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 [0, 0, 0],  
 [0, 0, 0]],  
  
 ...,  
  
 [[0, 0, 0],  
 [0, 0, 0],  
 [0, 0, 0],  
 [0, 0, 0]]],
```

```
[0, 0, 0],  
...,  
[0, 0, 0],  
[0, 0, 0],  
[0, 0, 0]],  
  
[[0, 0, 0],  
 [0, 0, 0],  
 [0, 0, 0],  
 ...,  
 [0, 0, 0],  
 [0, 0, 0],  
 [0, 0, 0]],  
  
[[0, 0, 0],  
 [0, 0, 0],  
 [0, 0, 0],  
 ...,  
 [0, 0, 0],  
 [0, 0, 0],  
 [0, 0, 0]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-6.jpg.rf.e1ef482779f9ef651ec62ed3a9c1e2d7.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 4.800558090209961, 'inference': 313.920259475708, 'post process': 0.9598731994628906}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [ 25, 35, 42],  
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 [ 88, 102, 96],  
 [ 76, 90, 84],  
 [ 51, 65, 59]],  
  
[[ 14, 24, 31],  
 [ 22, 32, 39],  
 [ 30, 41, 49],  
 ...,  
 [ 96, 110, 104],  
 [ 85, 99, 93],  
 [ 60, 74, 68]],  
  
[[ 13, 23, 30],  
 [ 25, 35, 42],  
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 ...,  
 [ 98, 113, 109],  
 [ 94, 109, 105],  
 [ 74, 89, 85]]],
```

```
...,  
[[ 77,  82,  81],  
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 [ 85,  86,  82],  
 [ 76,  77,  73],  
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[[ 80,  85,  84],  
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 [ 77,  79,  79],  
 ...,  
 [ 73,  75,  69],  
 [ 70,  72,  66],  
 [ 56,  58,  52]],  
  
[[ 83,  88,  87],  
 [ 81,  86,  85],  
 [ 72,  74,  74],  
 ...,  
 [ 60,  62,  56],  
 [ 67,  69,  63],  
 [ 59,  61,  55]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-70_jpg.rf.a6800b2698e4aed694cc0c0c8c866909.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 4.801750183105469, 'inference': 315.8392906188965, 'postprocess': 0.9598731994628906}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [ 58,  56,  56],  
      [ 59,  57,  57],  
      [ 57,  55,  55],  
      ...,  
      [ 65,  69,  70],  
      [ 74,  78,  79],  
      [ 80,  84,  85]],  
  
[[ 58,  56,  56],  
 [ 58,  56,  56],  
 [ 56,  54,  54],  
 ...,  
 [ 62,  66,  67],  
 [ 70,  74,  75],  
 [ 77,  81,  82]],  
  
[[ 55,  53,  53],  
 [ 55,  53,  53],
```

```
[ 53,  51,  51],  
...,  
[ 55,  60,  61],  
[ 65,  69,  70],  
[ 74,  78,  79]],  
  
...,  
  
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[213, 210, 212],  
[206, 203, 205]],  
  
[[242, 241, 237],  
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[216, 213, 215],  
[218, 215, 217],  
[211, 208, 210]],  
  
[[240, 239, 235],  
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[243, 242, 238],  
...,  
[217, 214, 216],  
[217, 214, 216],  
[209, 206, 208]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-71.jpg.rf.a66c60622f34ad56ff13e712485800ce.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 3.840923309326172, 'inference': 309.12041664123535, 'postprocess': 0.9596347808837891}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [102, 150, 156],  
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[ 24,  31,  51],  
[ 24,  31,  51]],  
  
[[109, 155, 163],  
[117, 163, 171],  
[129, 170, 179],  
...,  
[ 25,  32,  52],
```

```
[ 23,  30,  50],
[ 22,  29,  49]],

[[114, 156, 168],
[121, 163, 175],
[131, 169, 181],
...,
[ 24,  30,  49],
[ 21,  27,  46],
[ 20,  26,  45]],

....,

[[152, 168, 185],
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[150, 165, 181],
...,
[216, 220, 231],
[205, 209, 220],
[191, 195, 206]],

[[156, 171, 190],
[153, 169, 186],
[155, 171, 187],
...,
[213, 217, 228],
[202, 206, 217],
[188, 192, 203]],

[[157, 172, 191],
[152, 168, 185],
[156, 172, 189],
...,
[201, 205, 216],
[206, 210, 221],
[207, 211, 222]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-72.jpg.rf.8179b0a10f21dc1424a7ad48d8ef22f3.jpg'
probs: None
save_dir: None
speed: {'preprocess': 5.76019287109375, 'inference': 295.6814765930176, 'post process': 0.9596347808837891}, ultralytics.engine.results.Results object with attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[149, 145, 144],
[151, 147, 146],
[152, 148, 147],
...,
[153, 148, 149],
[157, 152, 153],
[159, 154, 155]],
```

```
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 [148, 143, 142],  
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 [169, 164, 165],  
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[[138, 129, 126],  
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...,  
  
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 [ 98, 104, 103],  
 ...,  
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 [124, 130, 129],  
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[[ 99, 105, 104],  
 [ 97, 103, 102],  
 [ 95, 101, 100],  
 ...,  
 [127, 133, 132],  
 [124, 130, 129],  
 [122, 128, 127]],  
  
[[ 96, 102, 101],  
 [ 94, 100,  99],  
 [ 92,  98,  97],  
 ...,  
 [126, 132, 131],  
 [123, 129, 128],  
 [121, 127, 126]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-7.jpg.rf.23286e3ec911b9f6f22c5153d60ec808.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 2.8810501098632812, 'inference': 320.63984870910645, 'postprocess': 0.0}]  
Model exported to: runs\\detect\\train6\\weights\\best.onnx
```

In [40]: # Use the model

```
model.train(data="C:/Users/shane/object-detect-main - Copy/Raccoon-38/data.yaml")
metrics = model.val() # evaluate model performance on the validation set
results = model("C:/Users/shane/object-detect-main - Copy/Raccoon-38/test/images")
path = model.export(format="onnx") # export the model to ONNX format

print("Training complete.")
print("Validation metrics:", metrics)
print("Prediction results:", results)
print("Model exported to:", path)
```

New <https://pypi.org/project/ultralytics/8.1.45> (<https://pypi.org/project/ultralytics/8.1.45>) available Update with 'pip install -U ultralytics'
 Ultralytics YOLOv8.0.196 Python-3.10.13 torch-2.2.1+cpu CPU (Intel Core(TM) i7-4790K 4.00GHz)

engine\trainer: task=detect, mode=train, model=yolov8s.yaml, data=C:/Users/shane/object-detect-main - Copy/Raccoon-38/data.yaml, epochs=3, patience=50, batch=16, imgsz=640, save=True, save_period=-1, cache=False, device=cpu, workers=8, project=None, name=None, exist_ok=False, pretrained=True, optimizer=auto, verbose=True, seed=0, deterministic=True, single_cls=False, rect=False, crop=False, close_mosaic=10, resume=False, amp=True, fraction=1.0, profile=False, freeze=None, overlap_mask=True, mask_ratio=4, dropout=0.0, val=True, split=val, save_json=False, save_hybrid=False, conf=None, iou=0.7, max_det=300, half=False, dnn=False, plots=True, source=None, show=False, save_txt=False, save_conf=False, save_crop=False, show_labels=True, show_conf=True, vid_stride=1, stream_buffer=False, line_width=None, visualize=False, augment=False, agnostic_nms=False, classes=None, retina_masks=False, boxes=True, format=torchscript, keras=False, optimize=False, int8=False, dynamic=False, simplify=False, opset=None, workspace=4, nms=False, 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=7.5, cls=0.5, df1=1.5, pose=12.0, kobj=1.0, label_smoothing=0.0, nbs=64, 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, cfg=None, tracker=botsort.yaml, save_dir=runs\detect\train7
 Overriding model.yaml nc=80 with nc=1

	from	n	params	module
arguments				
0		-1	1	928 ultralytics.nn.modules.conv.Conv
[3, 32, 3, 2]				
1		-1	1	18560 ultralytics.nn.modules.conv.Conv
[32, 64, 3, 2]				
2		-1	1	29056 ultralytics.nn.modules.block.C2f
[64, 64, 1, True]				
3		-1	1	73984 ultralytics.nn.modules.conv.Conv
[64, 128, 3, 2]				
4		-1	2	197632 ultralytics.nn.modules.block.C2f
[128, 128, 2, True]				
5		-1	1	295424 ultralytics.nn.modules.conv.Conv
[128, 256, 3, 2]				
6		-1	2	788480 ultralytics.nn.modules.block.C2f
[256, 256, 2, True]				
7		-1	1	1180672 ultralytics.nn.modules.conv.Conv
[256, 512, 3, 2]				
8		-1	1	1838080 ultralytics.nn.modules.block.C2f
[512, 512, 1, True]				
9		-1	1	656896 ultralytics.nn.modules.block.SPPF
[512, 512, 5]				
10		-1	1	0 torch.nn.modules.upsampling.Upsample
[None, 2, 'nearest']				
11		[-1, 6]	1	0 ultralytics.nn.modules.conv.Concat
[1]				
12		-1	1	591360 ultralytics.nn.modules.block.C2f
[768, 256, 1]				
13		-1	1	0 torch.nn.modules.upsampling.Upsample
[None, 2, 'nearest']				
14		[-1, 4]	1	0 ultralytics.nn.modules.conv.Concat
[1]				

```

15          -1  1    148224 ultralytics.nn.modules.block.C2f
[384, 128, 1]
16          -1  1    147712 ultralytics.nn.modules.conv.Conv
[128, 128, 3, 2]
17      [-1, 12] 1      0 ultralytics.nn.modules.conv.Concat
[1]
18          -1  1    493056 ultralytics.nn.modules.block.C2f
[384, 256, 1]
19          -1  1    590336 ultralytics.nn.modules.conv.Conv
[256, 256, 3, 2]
20      [-1, 9] 1      0 ultralytics.nn.modules.conv.Concat
[1]
21          -1  1    1969152 ultralytics.nn.modules.block.C2f
[768, 512, 1]
22      [15, 18, 21] 1    2116435 ultralytics.nn.modules.head.Detect
[1, [128, 256, 512]]
YOLOv8s summary: 225 layers, 11135987 parameters, 11135971 gradients, 28.6 GF
LOPs

```

TensorBoard: Start with 'tensorboard --logdir runs\detect\train7', view at <http://localhost:6006/> (<http://localhost:6006/>)

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

train: Scanning C:\Users\shane\object-detect-main - Copy\Raccoon-38\train\labels.cache... 150 images, 0 backgrounds, 0 corrupt: 100%|██████████| 150/150 [00:00<?, ?it/s]

val: Scanning C:\Users\shane\object-detect-main - Copy\Raccoon-38\valid\labels.cache... 29 images, 0 backgrounds, 0 corrupt: 100%|██████████| 29/29 [00:00 <?, ?it/s]

Plotting labels to runs\detect\train7\labels.jpg...

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

optimizer: AdamW(lr=0.002, momentum=0.9) with parameter groups 57 weight(decay=0.0), 64 weight(decay=0.0005), 63 bias(decay=0.0)

Image sizes 640 train, 640 val

Using 0 dataloader workers

Logging results to runs\detect\train7

Starting training for 3 epochs...

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
1/3	0G	3.03	3.433	4.208	19	64
0: 100%	██████████	10/10	[02:47<00:00, 16.76s/it]			
	Class	Images	Instances	Box(P	R	mAP50
mAP50-95): 100%	██████████	1/1	[00:11<00:00, 11.72s/it]			
	all	29	29	0.00333	1	0.0387
0.0144						

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
2/3	0G	3.185	3.452	4.146	13	64
0: 100%	██████████	10/10	[02:44<00:00, 16.46s/it]			
	Class	Images	Instances	Box(P	R	mAP50
mAP50-95): 100%	██████████	1/1	[00:11<00:00, 11.69s/it]			
	all	29	29	0.00333	1	0.101
0.0284						

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
3/3	0G	2.945	3.324	4.089	9	64
0: 100%	██████████	10/10	[02:50<00:00, 17.01s/it]			

	Class	Images	Instances	Box(P)	R	mAP50
mAP50-95): 100% ██████████ 1/1 [00:12<00:00, 12.49s/it]	all	29	29	0.00333	1	0.227

0.0539

3 epochs completed in 0.152 hours.

Optimizer stripped from runs\detect\train7\weights\last.pt, 22.5MB
Optimizer stripped from runs\detect\train7\weights\best.pt, 22.5MB

Validating runs\detect\train7\weights\best.pt...

Ultralytics YOLOv8.0.196 Python-3.10.13 torch-2.2.1+cpu CPU (Intel Core(TM) i7-4790K 4.00GHz)

YOLOv8s summary (fused): 168 layers, 11125971 parameters, 0 gradients, 28.4 G FLOPs

	Class	Images	Instances	Box(P)	R	mAP50
mAP50-95): 100% ██████████ 1/1 [00:10<00:00, 10.93s/it]	all	29	29	0.00333	1	0.259

0.0546

Speed: 3.2ms preprocess, 358.3ms inference, 0.0ms loss, 6.2ms postprocess per image

Results saved to runs\detect\train7

Ultralytics YOLOv8.0.196 Python-3.10.13 torch-2.2.1+cpu CPU (Intel Core(TM) i7-4790K 4.00GHz)

YOLOv8s summary (fused): 168 layers, 11125971 parameters, 0 gradients, 28.4 G FLOPs

val: Scanning C:\Users\shane\object-detect-main - Copy\Raccoon-38\valid\labels.cache... 29 images, 0 backgrounds, 0 corrupt: 100%|██████████| 29/29 [00:00 <, ?it/s]

	Class	Images	Instances	Box(P)	R	mAP50
mAP50-95): 100% ██████████ 2/2 [00:10<00:00, 5.26s/it]	all	29	29	0.00333	1	0.259

0.0546

Speed: 4.2ms preprocess, 342.7ms inference, 0.0ms loss, 5.1ms postprocess per image

Results saved to runs\detect\val12

```
image 1/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-57.jpg.rf.26f3fae218f26088f6a7405c58ae8020.jpg: 640x640 (no detection s), 316.8ms
image 2/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-58.jpg.rf.ff9de9977475e0086e7ab582122c5167.jpg: 640x640 (no detection s), 301.4ms
image 3/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-59.jpg.rf.388d6dd8c9d5a6fc7ca75790e680c269.jpg: 640x640 (no detection s), 286.1ms
image 4/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-60.jpg.rf.cff8b797e6b5c9b716b6be70be2b6b33.jpg: 640x640 (no detection s), 299.5ms
image 5/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-61.jpg.rf.58c4f561336525f59d395ce21508523b.jpg: 640x640 (no detection s), 302.4ms
image 6/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-62.jpg.rf.e997ede5457f069436178f08065d9a61.jpg: 640x640 (no detection s), 302.4ms
image 7/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-63.jpg.rf.1b33356e79739a8a1f3676a9f4f9f97a.jpg: 640x640 (no detection s), 289.9ms
image 8/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-64.jpg.rf.5201bb870708d051100bbbb8c148ecd2.jpg: 640x640 (no detection s), 307.2ms
image 9/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-66.jpg.rf.447ffe6a6b6cd768de213288bb000418.jpg: 640x640 (no detection s), 296.6ms
image 10/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-67.jpg.rf.626d83ff044dd4e2b37cbf4b4178eb89.jpg: 640x640 (no detection s), 281.3ms
image 11/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-68.jpg.rf.f307e4242845e8e03c27271f5b381eb0.jpg: 640x640 (no detection s), 299.5ms
image 12/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-69.jpg.rf.87d4a574d6f7ab57f5fc39620df291f9.jpg: 640x640 (no detection s), 293.8ms
image 13/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-6.jpg.rf.e1ef482779f9ef651ec62ed3a9c1e2d7.jpg: 640x640 (no detection s), 300.5ms
image 14/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-70.jpg.rf.a6800b2698e4aed694cc0c0c8c866909.jpg: 640x640 (no detection s), 308.2ms
image 15/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-71.jpg.rf.a66c60622f34ad56ff13e712485800ce.jpg: 640x640 (no detection s), 350.4ms
image 16/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-72.jpg.rf.8179b0a10f21dc1424a7ad48d8ef22f3.jpg: 640x640 (no detection s), 351.4ms
image 17/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-7.jpg.rf.23286e3ec911b9f6f22c5153d60ec808.jpg: 640x640 (no detection s), 389.8ms
Speed: 5.8ms preprocess, 310.4ms inference, 0.7ms postprocess per image at shape (1, 3, 640, 640)
Ultralytics YOLOv8.0.196 Python-3.10.13 torch-2.2.1+cpu CPU (Intel Core(TM) i7-4790K 4.00GHz)
```

PyTorch: starting from 'runs\detect\train7\weights\best.pt' with input shape (1, 3, 640, 640) BCHW and output shape(s) (1, 5, 8400) (21.5 MB)

ONNX: starting export with onnx 1.15.0 opset 17...

ONNX: export success 1.6s, saved as 'runs\detect\train7\weights\best.onnx' (42.6 MB)

Export complete (4.0s)

Results saved to C:\Users\shane\object-detect-main - Copy\ultralytics\runs\detect\train7\weights

Predict: yolo predict task=detect model=runs\detect\train7\weights\best.onnx imgs=640

Validate: yolo val task=detect model=runs\detect\train7\weights\best.onnx imgs=640 data=C:/Users/shane/object-detect-main - Copy/Raccoon-38/data.yaml

Visualize: <https://netron.app> (<https://netron.app>)

Training complete.

Validation metrics: ultralytics.utils.metrics.DetMetrics object with attributes:

```
ap_class_index: array([0])
box: ultralytics.utils.metrics.Metric object
confusion_matrix: <ultralytics.utils.metrics.ConfusionMatrix object at 0x0000
01EF592958A0>
fitness: 0.07502254396573405
keys: ['metrics/precision(B)', 'metrics/recall(B)', 'metrics/mAP50(B)', 'metr
ics/mAP50-95(B)']
maps: array([ 0.054619])
names: {0: 'raccoon'}
plot: True
results_dict: {'metrics/precision(B)': 0.003333333333333335, 'metrics/recall
(B)': 1.0, 'metrics/mAP50(B)': 0.25865630329393213, 'metrics/mAP50-95(B)': 0.
05461879292926759, 'fitness': 0.07502254396573405}
save_dir: WindowsPath('runs/detect/val2')
speed: {'preprocess': 4.171026164087756, 'inference': 342.6545077356799, 'los
s': 0.0, 'postprocess': 5.064799867827317}
Prediction results: [ultralytics.engine.results.Results object with attribute
s:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[ [ 35,  94,  86],
   [ 33,  92,  84],
   [ 30,  88,  83],
   ...,
   [ 50,  61,  75],
   [ 57,  67,  84],
   [ 57,  67,  84]],

[[ 34,  93,  85],
 [ 32,  91,  83],
 [ 30,  88,  83],
 ...,
 [ 38,  49,  63],
 [ 44,  54,  71],
 [ 43,  53,  70]],

[[ 34,  93,  85],
 [ 32,  91,  83],
 [ 33,  89,  84],
 ...,
 [ 36,  47,  61],
 [ 43,  54,  68],
 [ 44,  55,  69]],

...,

[[109, 112, 110],
 [110, 113, 111],
 [109, 114, 113],
 ...,
```

```
[ 23,  27,  28],  
[ 36,  40,  41],  
[ 57,  61,  62]],  
  
[[109, 113, 108],  
 [108, 112, 107],  
 [106, 111, 109],  
 ...,  
 [ 15,  19,  20],  
 [ 11,  15,  16],  
 [ 25,  29,  30]],  
  
[[105, 109, 104],  
 [103, 107, 102],  
 [101, 106, 104],  
 ...,  
 [ 49,  53,  54],  
 [ 29,  33,  34],  
 [ 10,  14,  15]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-57.jpg.rf.26f3fae218f26088f6a7405c58ae8020.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 4.801750183105469, 'inference': 316.7994022369385, 'postprocess': 0.0}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [233, 238, 237],  
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     [244, 246, 246],  
     [244, 246, 246],  
     [244, 246, 246]],  
  
[[233, 238, 237],  
 [233, 238, 237],  
 [233, 238, 237],  
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 [244, 246, 246],  
 [244, 246, 246],  
 [244, 246, 246]],  
  
[[233, 238, 237],  
 [233, 238, 237],  
 [233, 238, 237],  
 ...,  
 [244, 246, 246],  
 [244, 246, 246],  
 [244, 246, 246]],  
  
...,
```

```
[[ 34, 114, 191],
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 [ 37, 117, 194],
 ...,
 [ 49, 114, 182],
 [ 47, 112, 180],
 [ 43, 108, 176]],

[[ 19,  96, 175],
 [ 21,  98, 177],
 [ 25, 102, 181],
 ...,
 [ 46, 106, 176],
 [ 47, 109, 179],
 [ 45, 107, 177]],

[[ 6,  83, 162],
 [ 9,  86, 165],
 [14,  91, 170],
 ...,
 [ 39,  98, 168],
 [ 45, 105, 175],
 [ 44, 104, 174]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-58.jpg.rf.ff9de9977475e0086e7ab582122c5167.jpg'
probs: None
save_dir: None
speed: {'preprocess': 5.759954452514648, 'inference': 301.4404773712158, 'postprocess': 0.9598731994628906}, ultralytics.engine.results.Results object with attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[ [222, 239, 242],
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 [222, 239, 242],
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 [242, 244, 245],
 [242, 244, 245],
 [242, 244, 245]],

 [[222, 239, 242],
 [222, 239, 242],
 [222, 239, 242],
 ...,
 [242, 244, 245],
 [242, 244, 245],
 [242, 244, 245]],

 [[222, 239, 242],
 [222, 239, 242],
 [222, 239, 242],
 ...,
 [242, 244, 245],
 [242, 244, 245],
 [242, 244, 245]]]]
```

```
[242, 244, 245],  
[242, 244, 245]],  
  
...,  
  
[[ 37,  96, 175],  
 [ 43, 103, 179],  
 [ 46, 104, 180],  
 ...,  
 [ 77, 147, 207],  
 [ 76, 148, 208],  
 [ 76, 148, 208]],  
  
[[ 38,  97, 176],  
 [ 42, 102, 178],  
 [ 43, 103, 179],  
 ...,  
 [ 76, 143, 200],  
 [ 75, 143, 202],  
 [ 76, 144, 203]],  
  
[[ 41, 100, 179],  
 [ 43, 103, 179],  
 [ 43, 103, 179],  
 ...,  
 [ 72, 137, 192],  
 [ 70, 137, 194],  
 [ 71, 138, 195]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-59.jpg.rf.388d6dd8c9d5a6fc7ca75790e680c269.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 4.799604415893555, 'inference': 286.08012199401855, 'postprocess': 0.9603500366210938}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [ 83,  90,  93],  
     [ 93, 100, 103],  
     [ 97, 104, 107],  
     ...,  
     [ 81,  92, 100],  
     [ 92, 103, 111],  
     [ 97, 108, 116]],  
  
[[ 85,  92,  95],  
 [ 95, 102, 105],  
 [ 98, 105, 108],  
 ...,  
 [ 88,  99, 107],  
 [ 93, 104, 112],  
 [ 93, 104, 112]]],
```

```
[[ 96, 103, 106],
 [105, 112, 115],
 [108, 115, 118],
 ...,
 [[ 77,  88,  96],
 [ 86,  97, 105],
 [ 89, 100, 108]],

 ...,

 [[ 26,  40,  38],
 [ 26,  40,  38],
 [ 26,  40,  38],
 ...,
 [[ 26,  40,  39],
 [ 26,  40,  39],
 [ 26,  40,  39]],

 [[ 26,  40,  38],
 [ 26,  40,  38],
 [ 26,  40,  38],
 ...,
 [[ 26,  40,  39],
 [ 26,  40,  39],
 [ 26,  40,  39]],

 [[ 26,  40,  38],
 [ 26,  40,  38],
 [ 26,  40,  38],
 ...,
 [[ 26,  40,  39],
 [ 26,  40,  39],
 [ 26,  40,  39]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-60.jpg.rf.cff8b797e6b5c9b716b6be70be2b6b33.jpg'
probs: None
save_dir: None
speed: {'preprocess': 5.76019287109375, 'inference': 299.52096939086914, 'postprocess': 0.9601116180419922}, ultralytics.engine.results.Results object with attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[ [ 29,  77,  29],
 [ 24,  72,  24],
 [ 22,  69,  23],
 ...,
 [ 39,  58,  25],
 [ 50,  67,  33],
 [ 60,  77,  43]],

 [[ 30,  78,  30],
 [ 24,  72,  24],
 [ 22,  69,  23],
```

```
...,
[ 40,  59,  26],
[ 52,  69,  35],
[ 62,  79,  45]],

[[ 32,  78,  31],
[ 27,  73,  26],
[ 24,  70,  24],
...,
[ 46,  63,  30],
[ 54,  69,  37],
[ 59,  74,  42]],

...,

[[ 89,  87,  87],
[ 88,  86,  86],
[ 87,  85,  85],
...,
[ 66, 103,  69],
[ 90, 140,  92],
[108, 165, 110]],

[[ 78,  76,  76],
[ 76,  74,  74],
[ 76,  74,  74],
...,
[ 56,  94,  58],
[ 83, 136,  86],
[103, 162, 104]],

[[ 76,  74,  74],
[ 74,  72,  72],
[ 74,  72,  72],
...,
[ 48,  86,  50],
[ 81, 134,  84],
[105, 164, 106]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-61.jpg.rf.58c4f561336525f59d395ce21508523b.jpg'
probs: None
save_dir: None
speed: {'preprocess': 5.761384963989258, 'inference': 302.3993968963623, 'postprocess': 0.0}, ultralytics.engine.results.Results object with attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[220, 166, 135],
                 [219, 165, 134],
                 [221, 166, 135],
                 ...,
                 [ 94, 111, 138],
                 [ 84,  98, 126],
                 [104, 119, 145]]],
```

```
[[219, 165, 134],  
 [219, 165, 134],  
 [221, 166, 135],  
 ...,  
 [ 97, 113, 142],  
 [ 83, 97, 125],  
 [111, 126, 152]],  
  
[[220, 165, 134],  
 [220, 165, 134],  
 [223, 166, 135],  
 ...,  
 [ 99, 115, 144],  
 [ 77, 91, 119],  
 [115, 129, 157]],  
  
...,  
  
[[129, 126, 135],  
 [ 66, 65, 74],  
 [ 12, 11, 20],  
 ...,  
 [140, 167, 204],  
 [191, 212, 250],  
 [ 45, 62, 101]],  
  
[[231, 227, 233],  
 [179, 177, 183],  
 [ 98, 96, 102],  
 ...,  
 [119, 148, 185],  
 [188, 207, 245],  
 [ 51, 66, 105]],  
  
[[131, 127, 133],  
 [197, 193, 199],  
 [215, 213, 219],  
 ...,  
 [110, 139, 176],  
 [193, 212, 250],  
 [ 61, 76, 115]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-62.jpg.rf.e997ede5457f069436178f08065d9a61.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 5.760908126831055, 'inference': 302.3996353149414, 'postprocess': 0.0}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[171, 148, 152],  
 [181, 158, 162],  
 [213, 191, 193],
```

```
...,
[[ 3,  65,  49],
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[ 0,  47,  34]],

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[222, 199, 203],
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...,
[ 36,  98,  82],
[ 37, 106,  91],
[ 6,  78,  65]],

[[212, 189, 193],
[222, 199, 203],
[207, 185, 187],
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[ 50, 113,  97],
[ 55, 126, 110],
[ 21,  96,  82]],

...,

[[193, 198, 207],
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[ 35,  55,  42],
[ 31,  52,  37]],

[[169, 175, 182],
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[231, 235, 246],
...,
[ 38,  64,  48],
[ 39,  60,  45],
[ 37,  56,  39]],

[[ 38,  44,  51],
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[158, 162, 173],
...,
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[ 47,  69,  51],
[ 46,  65,  48]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\Users\\shane\\object-detect-main - Copy\\Raccoon-38\\test\\images\\raccoon-63.jpg.rf.1b33356e79739a8a1f3676a9f4f9f97a.jpg'
probs: None
save_dir: None
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boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
```

```
names: {0: 'raccoon'}
orig_img: array([[ [163, 147, 148],
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   [ 58,  60,  84],
   [ 57,  59,  83]],

   [[163, 147, 148],
   [163, 147, 148],
   [163, 147, 148],
   ...,
   [ 60,  62,  86],
   [ 58,  60,  84],
   [ 57,  59,  83]],

   [[163, 147, 148],
   [163, 147, 148],
   [163, 147, 148],
   ...,
   [ 60,  62,  86],
   [ 58,  60,  84],
   [ 57,  59,  83]],

   ...,

   [[ 31,  32,  42],
   [ 25,  26,  36],
   [  9,  10,  20],
   ...,
   [144,  50,  21],
   [145,  51,  22],
   [143,  49,  20]],

   [[ 31,  32,  42],
   [ 34,  35,  45],
   [ 26,  27,  37],
   ...,
   [146,  49,  21],
   [147,  50,  22],
   [146,  49,  21]],

   [[ 34,  35,  45],
   [ 36,  37,  47],
   [ 27,  28,  38],
   ...,
   [147,  50,  22],
   [150,  51,  23],
   [148,  49,  21]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-64.jpg.rf.5201bb870708d051100bbbb8c148ecd2.jpg'
probs: None
save_dir: None
speed: {'preprocess': 6.722450256347656, 'inference': 307.19780921936035, 'postprocess': 0.9605884552001953}, ultralytics.engine.results.Results object with 1 items
```

th attributes:

```
boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[ [ 84, 110, 127],
   [ 85, 111, 128],
   [ 86, 112, 129],
   ...,
   [ 67, 100, 116],
   [ 62, 96, 112],
   [ 65, 99, 115]],

[[ 84, 110, 127],
 [ 87, 113, 130],
 [ 89, 115, 132],
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 [ 70, 103, 119],
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 [ 65, 99, 115]],

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 [ 69, 93, 117],
 [ 70, 94, 118],
 [ 76, 100, 124]],

[[ 62, 78, 91],
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 [ 64, 88, 112],
 [ 72, 96, 120],
 [ 82, 106, 130]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images'
```

```
\\"raccoon-66.jpg.rf.447ffe6a6b6cd768de213288bb000418.jpg'
probs: None
save_dir: None
speed: {'preprocess': 5.760431289672852, 'inference': 296.63991928100586, 'postprocess': 0.9598731994628906}, ultralytics.engine.results.Results object with attributes:

boxes: ultralytics.engine.results.Boxes object
keypoints: None
masks: None
names: {0: 'raccoon'}
orig_img: array([[ [ 45,  75,  86],
   [ 44,  74,  85],
   [ 43,  73,  84],
   ...,
   [ 44, 114,  83],
   [ 40, 113,  81],
   [ 40, 114,  80]],

[[ 45,  75,  86],
 [ 44,  74,  85],
 [ 43,  73,  84],
 ...,
 [ 48, 118,  87],
 [ 36, 109,  77],
 [ 27, 101,  67]],

[[ 47,  75,  86],
 [ 46,  74,  85],
 [ 45,  73,  84],
 ...,
 [ 46, 116,  85],
 [ 43, 116,  84],
 [ 39, 113,  79]],

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[[ 87, 112, 138],
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 [ 91, 116, 142],
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 [ 59, 104,  85],
 [ 61, 106,  87]],

[[109, 134, 160],
 [111, 136, 162],
 [112, 137, 163],
 ...,
 [ 57,  99,  82],
 [ 59, 104,  85],
 [ 62, 107,  88]],

[[112, 137, 163],
 [115, 140, 166],
 [115, 140, 166],
 ...,
```

```
[ 57,  99,  82],  
[ 59, 104,  85],  
[ 62, 107,  88]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-67.jpg.rf.626d83ff044dd4e2b37cbf4b4178eb89.jpg'  
probs: None  
save_dir: None  
speed: {'preprocess': 4.8007965087890625, 'inference': 281.2802791595459, 'postprocess': 0.9596347808837891}, ultralytics.engine.results.Results object with attributes:  
  
boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [ 14,  24,  24],  
    [ 14,  24,  24],  
    [ 14,  24,  24],  
    ...,  
    [ 25,  30,  29],  
    [ 26,  31,  30],  
    [ 26,  31,  30]],  
  
    [[ 14,  24,  24],  
    [ 14,  24,  24],  
    [ 14,  24,  24],  
    ...,  
    [ 25,  30,  29],  
    [ 26,  31,  30],  
    [ 26,  31,  30]],  
  
    [[ 14,  24,  24],  
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    ...,  
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    [ 10,  14,  15],  
    [  9,  13,  14]],  
  
    [[ 23,  39,  55],  
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    [ 66,  81,  97],  
    ...,  
    [  7,  11,  12],  
    [  8,  12,  13],  
    [  9,  13,  14]]],
```

```
[[ 45,  61,  77],  
 [ 77,  93, 109],  
 [ 72,  87, 103],  
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probs: None  
save_dir: None  
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masks: None  
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```

```
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....,
```

```
[0, 0, 0],  
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[0, 0, 0]],  
  
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[0, 0, 0],  
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[0, 0, 0]]], dtype=uint8)  
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probs: None  
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names: {0: 'raccoon'}  
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      [ 51,  65,  59]],  
  
[[ 14,  24,  31],  
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[ 30,  41,  49],  
...,  
[ 96, 110, 104],  
[ 85,  99,  93],  
[ 60,  74,  68]],  
  
[[ 13,  23,  30],  
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[ 94, 109, 105],  
[ 74,  89,  85]],  
  
...,
```

```
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 [ 56,  58,  52]],

 [[ 83,  88,  87],
 [ 81,  86,  85],
 [ 72,  74,  74],
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 [[ 60,  62,  56],
 [ 67,  69,  63],
 [ 59,  61,  55]]], dtype=uint8)
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probs: None
save_dir: None
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boxes: ultralytics.engine.results.Boxes object
keypoints: None
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names: {0: 'raccoon'}
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 [[ 58,  56,  56],
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 [ 77,  81,  82]],

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 [ 53,  51,  51],
 ...,
 [ 55,  60,  61],
```

```
[ 65,  69,  70],  
[ 74,  78,  79]],  
  
...,  
  
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[[242, 241, 237],  
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[[240, 239, 235],  
[240, 239, 235],  
[243, 242, 238],  
...,  
[217, 214, 216],  
[217, 214, 216],  
[209, 206, 208]]], dtype=uint8)  
orig_shape: (416, 416)  
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probs: None  
save_dir: None  
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boxes: ultralytics.engine.results.Boxes object  
keypoints: None  
masks: None  
names: {0: 'raccoon'}  
orig_img: array([[ [102, 150, 156],  
    [112, 158, 165],  
    [124, 167, 176],  
    ...,  
    [ 26,  33,  53],  
    [ 24,  31,  51],  
    [ 24,  31,  51]],  
  
[[109, 155, 163],  
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[129, 170, 179],  
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[ 23,  30,  50],  
[ 22,  29,  49]]],
```

```
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 [201, 205, 216],  
 [206, 210, 221],  
 [207, 211, 222]]], dtype=uint8)  
orig_shape: (416, 416)  
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-72.jpg.rf.8179b0a10f21dc1424a7ad48d8ef22f3.jpg'  
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masks: None  
names: {0: 'raccoon'}  
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[[141, 136, 135],  
 [144, 139, 138],  
 [148, 143, 142],
```

```

    ...,
    [169, 164, 165],
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    [173, 168, 169]],

    [[138, 129, 126],
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     [180, 175, 176]],

    ...,

    [[103, 109, 108],
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     [124, 130, 129],
     [123, 129, 128]],

    [[ 99, 105, 104],
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     [127, 133, 132],
     [124, 130, 129],
     [122, 128, 127]],

    [[ 96, 102, 101],
     [ 94, 100,  99],
     [ 92,  98,  97],
     ...,
     [126, 132, 131],
     [123, 129, 128],
     [121, 127, 126]]], dtype=uint8)
orig_shape: (416, 416)
path: 'C:\\\\Users\\\\shane\\\\object-detect-main - Copy\\\\Raccoon-38\\\\test\\\\images\\\\raccoon-7.jpg.rf.23286e3ec911b9f6f22c5153d60ec808.jpg'
probs: None
save_dir: None
speed: {'preprocess': 5.76019287109375, 'inference': 389.7593021392822, 'post process': 0.9598731994628906}]
Model exported to: runs\\detect\\train7\\weights\\best.onnx

```

In [42]: # Path to the latest checkpoint

```

checkpoint_path = "C:/Users/shane/object-detect-main - Copy/ultralytics/runs/de
# Initialize the YOLO model from the checkpoint
model = YOLO(checkpoint_path)

```

```
In [44]: # Path to your dataset's YAML file  
data_yaml_path = "C:/Users/shane/object-detect-main - Copy/Raccoon-38/data.yaml"
```

```
In [45]: # Continue training from the checkpoint  
model.train(data=data_yaml_path, epochs=3, device='cpu')  
# Evaluate model performance on the validation set  
metrics = model.val()  
  
# Optionally, predict on new data or test set  
# Ensure you provide the correct path to your test images  
results = model.predict("C:/Users/shane/object-detect-main - Copy/Raccoon-38/test")  
  
# Export the fine-tuned model to ONNX format  
path = model.export(format="onnx")
```

```
New https://pypi.org/project/ultralytics/8.1.45 (https://pypi.org/project/u  
ltralytics/8.1.45) available Update with 'pip install -U ultralytics'  
Ultralytics YOLOv8.0.196 Python-3.10.13 torch-2.2.1+cpu CPU (Intel Core(T  
M) i7-4790K 4.00GHz)  
engine\trainer: task=detect, mode=train, model=C:/Users/shane/object-detect  
-main - Copy/ultralytics/runs/detect/train7/weights/best.pt, data=C:/Users/  
shane/object-detect-main - Copy/Raccoon-38/data.yaml, epochs=3, patience=5  
0, batch=16, imgsz=640, save=True, save_period=-1, cache=False, device=cpu,  
workers=8, project=None, name=None, exist_ok=False, pretrained=True, optimi  
zer=auto, verbose=True, seed=0, deterministic=True, single_cls=False, rect=  
False, cos_lr=False, close_mosaic=10, resume=False, amp=True, fraction=1.0,  
profile=False, freeze=None, overlap_mask=True, mask_ratio=4, dropout=0.0, v  
al=True, split=val, save_json=False, save_hybrid=False, conf=None, iou=0.7,  
max_det=300, half=False, dnn=False, plots=True, source=None, show=False, sa  
ve_txt=False, save_conf=False, save_crop=False, show_labels=True, show_conf  
=True, vid_stride=1, stream_buffer=False, line_width=None, visualize=False,  
augment=False, agnostic_nms=False, classes=None, retina_masks=False, boxes=  
True, format=torchscript, keras=False, optimize=False, int8=False, dynamic=  
False, simplify=False, opset=None, workspace=4, nms=False, lr0=0.01, lrf=0.  
01
```

```
In [51]: # Initialize the model from a checkpoint for fine-tuning
checkpoint_path = "C:/Users/shane/object-detect-main - Copy/ultralytics/runs/de
model = YOLO(checkpoint_path)

# Fine-tuning configuration
train_args = {
    "data": data_yaml_path, # Make sure this is the correct path
    "epochs": 50, # More epochs for fine-tuning
    "batch": 16, # Batch size
    "imgsz": 640, # Image size
    "device": 'cpu', # or "cuda" for GPU
    "optimizer": 'Adam',
    "lr0": 0.001, # Learning rate
    # "patience": 3, # This parameter may not be directly supported, depending
}

# Start fine-tuning
model.train(**train_args)

# Evaluate model performance on the validation set
metrics = model.val()

# Predict on test set
results = model.predict("C:/Users/shane/object-detect-main - Copy/Raccoon-38/test")

# Print validation metrics and results
print("Validation metrics:", metrics)
print("Prediction results:", results)
```

	41/50	0G	1.877	2.221	2.603	7	6
40:	100%	[██████████]	10/10	[02:39<00:00, 15.94s/it]			
		Class	Images	Instances	Box(P	R	mAP
50	mAP50-95):	100%	[██████████]	1/1	[00:12<00:00, 12.12s/it]		
		all	29	29	0.713	0.862	0.8
45		0.402					
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Si
ze	42/50	0G	1.787	1.974	2.562	7	6
40:	100%	[██████████]	10/10	[02:36<00:00, 15.67s/it]			
		Class	Images	Instances	Box(P	R	mAP
50	mAP50-95):	100%	[██████████]	1/1	[00:11<00:00, 11.22s/it]		
		all	29	29	0.743	0.931	0.8
71		0.391					
	Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Si
ze	43/50	0G	1.695	1.758	2.517	6	6
40:	100%	[██████████]	10/10	[02:32<00:00, 15.88s/it]			

In [57]: # Predict on a single image or a List of images
results = model.predict("C:/Users/shane/object-detect-main - Copy/Raccoon-38/test/images/raccoon-57.jpg")

```
image 1/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-57.jpg.rf.26f3fae218f26088f6a7405c58ae8020.jpg: 640x640 2 raccoons, 326.4ms
image 2/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-58.jpg.rf.ff9de9977475e0086e7ab582122c5167.jpg: 640x640 3 raccoons, 308.2ms
image 3/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-59.jpg.rf.388d6dd8c9d5a6fc7ca75790e680c269.jpg: 640x640 3 raccoons, 372.5ms
image 4/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-60.jpg.rf.cff8b797e6b5c9b716b6be70be2b6b33.jpg: 640x640 1 raccoon, 381.1ms
image 5/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-61.jpg.rf.58c4f561336525f59d395ce21508523b.jpg: 640x640 1 raccoon, 312.0ms
image 6/17 C:\Users\shane\object-detect-main - Copy\Raccoon-38\test\images\raccoon-62.jpg.rf.e997ede5457f069436178f08065d9a61.jpg: 640x640 2 raccoons, 366.7ms
.
```

```
In [60]: from PIL import Image
from IPython.display import display

# Visualize the results
for i, predictions in enumerate(results):
    print(f"Results for image {i + 1}:")
    for j, r in enumerate(predictions):
        print(f"Prediction {j + 1}:")
        # Plot results image
        im_bgr = r.plot() # BGR-order numpy array
        im_rgb = Image.fromarray(im_bgr[..., ::-1]) # RGB-order PIL image

    # Display image in notebook
    display(im_rgb)
```

Results for image 1:

Prediction 1:

