

# Object Detection

## YOLOv11 model

### 1. Install Ultralytics YOLOv11

```
pip install ultralytics
```

✓ 5.2s

```
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: ultralytics in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\ultralytics
Requirement already satisfied: numpy>=1.23.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\numpy
Requirement already satisfied: matplotlib>=3.3.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\matplotlib
Requirement already satisfied: opencv-python>=4.6.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\opencv-python
Requirement already satisfied: pillow>=7.1.2 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\pillow
Requirement already satisfied: pyyaml>=5.3.1 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\pyyaml
Requirement already satisfied: requests>=2.23.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\requests
Requirement already satisfied: scipy>=1.4.1 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\scipy
Requirement already satisfied: torch>=1.8.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\torch
Requirement already satisfied: torchvision>=0.9.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\torchvision
Requirement already satisfied: psutil>=5.8.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\psutil
Requirement already satisfied: polaris>=0.20.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\polaris
Requirement already satisfied: ultralytics-thop>=2.0.18 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\ultralytics-thop
Requirement already satisfied: contourpy>=1.0.1 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\contourpy
Requirement already satisfied: cycler>=0.10 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\cycler
Requirement already satisfied: fonttools>=4.22.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\fonttools
Requirement already satisfied: kiwisolver>=1.3.1 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\kiwisolver
Requirement already satisfied: packaging>=20.0 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\packaging
Requirement already satisfied: pyparsing>=3 in c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13_qbz5n2kfra8p0\local\-packages\pyparsing
```

Defaulting to user installation because normal site-packages is not writeable

Requirement already satisfied: ultralytics in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
(8.3.230) 2kfra8p0\localcache\local-packages\python313\site-packages

Requirement already satisfied: numpy>=1.23.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
(2.2.6) 2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)

Requirement already satisfied: matplotlib>=3.3.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)  
(3.10.7)

Requirement already satisfied: opencv-python>=4.6.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)  
(4.12.0.88)

Requirement already satisfied: pillow>=7.1.2 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)  
(12.0.0)

Requirement already satisfied: pyyaml>=5.3.1 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
(6.0.2) 2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)

Requirement already satisfied: requests>=2.23.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)  
(2.32.5)

Requirement already satisfied: scipy>=1.4.1 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)  
(1.16.2)

Requirement already satisfied: torch>=1.8.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)  
(2.9.1+cpu)

Requirement already satisfied: torchvision>=0.9.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)  
(0.24.1+cpu)

Requirement already satisfied: psutil>=5.8.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
(7.0.0) 2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)

Requirement already satisfied: polars>=0.20.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)  
(1.35.2)

Requirement already satisfied: ultralytics-thop>=2.0.18 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from ultralytics)  
(2.0.18)

Requirement already satisfied: contourpy>=1.0.1 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from  
(1.3.3) matplotlib>=3.3.0->ultralytics)

Requirement already satisfied: cyeler>=0.10 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from  
(0.12.1) matplotlib>=3.3.0->ultralytics)

Requirement already satisfied: fonttools>=4.22.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from  
(4.60.1) matplotlib>=3.3.0->ultralytics)

Requirement already satisfied: kiwisolver>=1.3.1 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n

2kfra8p0\localcache\local-packages\python313\site-packages (from  
(1.4.9) matplotlib>=3.3.0->ultralytics)

Requirement already satisfied: packaging>=20.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from  
(25.0) matplotlib>=3.3.0->ultralytics)

Requirement already satisfied: pyparsing>=3 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from  
(3.2.5) matplotlib>=3.3.0->ultralytics)

Requirement already satisfied: python-dateutil>=2.7 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from matplotlib>=3.3.0->ultralytics) (2.9.0.post0)

Requirement already satisfied: polars-runtime-32==1.35.2 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from polars>=0.20.0-  
(1.35.2) >ultralytics)

Requirement already satisfied: six>=1.5 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from python-  
(1.17.0) dateutil>=2.7->matplotlib>=3.3.0->ultralytics)

Requirement already satisfied: charset\_normalizer<4,>=2 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from requests>=2.23.0-  
(3.4.3) >ultralytics)

Requirement already satisfied: idna<4,>=2.5 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from requests>=2.23.0-  
(3.10) >ultralytics)

Requirement already satisfied: urllib3<3,>=1.21.1 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from requests>=2.23.0-  
(2.5.0) >ultralytics)

Requirement already satisfied: certifi>=2017.4.17 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from requests>=2.23.0-  
(2025.8.3) >ultralytics)

Requirement already satisfied: filelock in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from torch>=1.8.0-  
(3.19.1) >ultralytics)

Requirement already satisfied: typing-extensions>=4.10.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from torch>=1.8.0-  
(4.15.0) >ultralytics)

Requirement already satisfied: sympy>=1.13.3 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from torch>=1.8.0-  
(1.14.0) >ultralytics)

Requirement already satisfied: networkx>=2.5.1 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from torch>=1.8.0-  
(3.5) >ultralytics)

Requirement already satisfied: jinja2 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from torch>=1.8.0-  
(3.1.6) >ultralytics)

Requirement already satisfied: fsspec>=0.8.5 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from torch>=1.8.0-  
(2025.9.0) >ultralytics)

Requirement already satisfied: setuptools in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from torch>=1.8.0-  
(80.9.0) >ultralytics)

Requirement already satisfied: mpmath<1.4,>=1.1.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from sympy>=1.13.3-  
(1.3.0) >torch>=1.8.0->ultralytics)

Requirement already satisfied: MarkupSafe>=2.0 in  
c:\users\96650\appdata\local\packages\pythonsoftwarefoundation.python.3.13\_qbz5n  
2kfra8p0\localcache\local-packages\python313\site-packages (from jinja2-  
(3.0.2) >torch>=1.8.0->ultralytics)

.Note: you may need to restart the kernel to use updated packages

2. To make sure dataset is loaded correctly, load images and their labels. check that the number of images matches the number of labels to avoid any errors. Then display 5 random images and their annotations.

```
import os
import cv2
import matplotlib.pyplot as plt
import random
import time
from ultralytics import YOLO
from IPython.display import Image, display

train_path = r"C:\Users\96650\Downloads\Aquarium Object Detection Dataset\train\images"
test_path = r"C:\Users\96650\Downloads\Aquarium Object Detection Dataset\test"
valid_path = r"C:\Users\96650\Downloads\Aquarium Object Detection Dataset\valid\images"

# Function to load images and labels
def load_dataset(dataset_path):
    images_path = os.path.join(dataset_path, 'images')
    labels_path = os.path.join(dataset_path, 'labels')

    image_files = sorted([os.path.join(images_path, f) for f in os.listdir(images_path) if f.endswith('.jpg') or f.endswith('.png')])
    label_files = sorted([os.path.join(labels_path, f) for f in os.listdir(labels_path) if f.endswith('.txt')])

    # Check that number of images matches the number of labels
    assert len(image_files) == len(label_files), "Number of images and labels do not match!"

    return image_files, label_files
```

```
train_images, train_labels = load_dataset(r"C:\Users\96650\Downloads\Aquarium Object Detection Dataset\train")

# Function for displaying 5 random images with annotations
def display_random_images_with_labels(image_files, label_files, num_images=5):

    indices = random.sample(range(len(image_files)), num_images)
    for i in indices:

        img = cv2.imread(image_files[i])
        img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)

        with open(label_files[i], 'r') as f:
            annotations = f.readlines()

        # Print the annotations
        print(f"Annotations for {os.path.basename(image_files[i])}:")
        print(annotations)

        plt.imshow(img)
        plt.title(f"Image: {os.path.basename(image_files[i])}")
        plt.axis('off')
        plt.show()

    # Display 5 random images
    display_random_images_with_labels(train_images, train_labels, num_images=5)
```

Python

```
Annotations for IMG_8494.jpg.rf.a68f75721ae7ee1a6bf2caa88aab6cc1.jpg:
[ '0 0.462890625 0.67578125 0.0751953125 0.4973958333333333\n', '4 0.4375 0.2578125 0.1015625 0.18880208333333334\n', '4 0.466796875 0.908854
```



:Annotations for IMG\_8494.jpg.rf.a68f75721ae7ee1a6bf2caa88aab6cc1.jpg

```
n', '4 0.4375 \0.4973958333333333 0.0751953125 0.67578125 0.462890625 0']  
0.2578125 0.1015625 0.1888020833333334\n', '4 0.466796875 0.9088541666666666  
[0.107421875 0.17838541666666666
```

```
Annotations for IMG_2628.jpeg.jpg.rf.c607a4280b054d5a636f5ee3398b886d.jpg:  
[ '6 0.4361979166666667 0.388671875 0.6861979166666666 0.4208984375' ]
```

Image: IMG\_2628.jpeg.jpg.rf.c607a4280b054d5a636f5ee3398b886d.jpg



```
Annotations for IMG_8403.jpg.rf.eacd563b31d0cdecfb5f3b7e5c11c453.jpg:  
[ '6 0.173828125 0.4752604166666667 0.1171875 0.3684895833333333\n', '0 0.8447265625 0.5260416666666666 0.1005859375 0.125\n', '0 0.9619140625\n' ]
```

Image: IMG\_8403.jpg.rf.eacd563b31d0cdecfb5f3b7e5c11c453.jpg



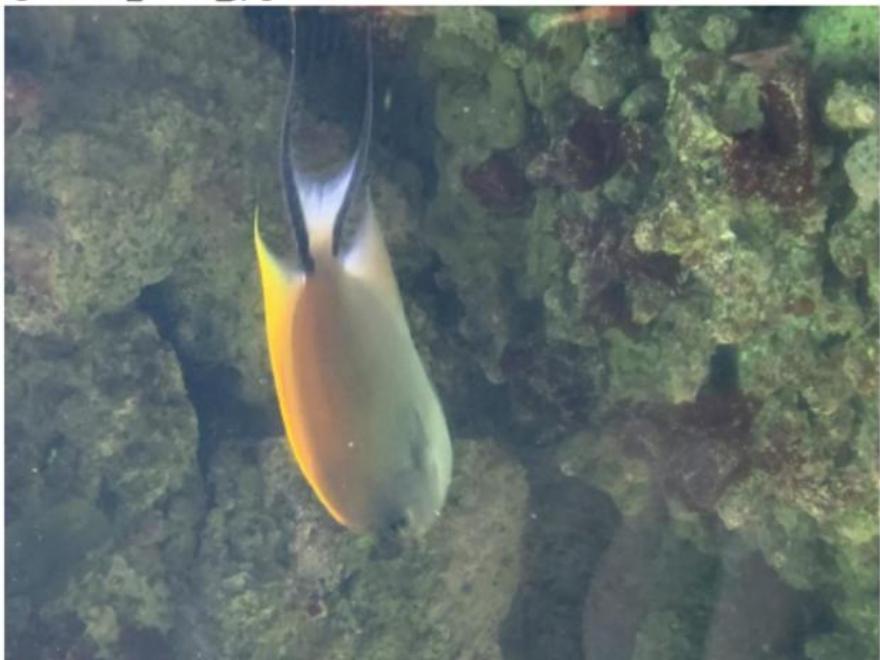
:Annotations for IMG\_8403.jpg.rf.eacd563b31d0cdecfb5f3b7e5c11c453.jpg

```
n', '0 \0.3684895833333333 0.1171875 0.4752604166666667 0.173828125 6']  
0.8447265625 0.5260416666666666 0.1005859375 0.125\n', '0 0.9619140625  
0.19401041666666666 0.0283203125 0.1184895833333333\n', '0 0.73828125  
0.6419270833333334 0.091796875 0.1119791666666667\n', '0 0.3525390625  
0.6940104166666666 0.0224609375 0.0768229166666667\n', '0 0.291015625  
0.6966145833333334 0.017578125 0.0677083333333333\n', '0 0.1796875  
0.7408854166666666 0.013671875 0.05859375\n', '0 0.22265625 0.69921875  
0.0107421875 0.046875\n', '0 0.1708984375 0.6848958333333334 0.044921875
```

0.04557291666666664\n', '4 0.3603515625 0.4752604166666667 0.0693359375  
['0.4270833333333333

Annotations for IMG\_8550.jpg.rf.7f9f25d5d968b77bc0664fb82fc9a9c9.jpg:  
['0 0.3994140625 0.404296875 0.228515625 0.80859375']

Image: IMG\_8550.jpg.rf.7f9f25d5d968b77bc0664fb82fc9a9c9.jpg



Annotations for IMG\_3149.jpeg.jpg.rf.ec910aff6521c2af1a1bcbe5887b07f7.jpg:  
['3 0.4231770833333333 0.3740234375 0.3658854166666667 0.423828125']

Image: IMG\_3149.jpeg.jpg.rf.ec910aff6521c2af1a1bcbe5887b07f7.jpg



### 3. Train YOLOv11 model

```
model = YOLO("yolo11n.pt") # or yolo11s.pt / yolo11m.pt etc.

results = model.train(
    data = r'C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\data.yaml',
    epochs = 25,
    imgsz = 640,
    batch = 16,
)

✓ 227m 38.7s
```

New <https://pypi.org/project/ultralytics/8.3.233> available Update with 'pip install -U ultralytics'  
Ultralytics 8.3.230 Python-3.13.9 torch-2.9.1+cpu CPU (11th Gen Intel Core i7-1195G7 @ 2.90GHz)  
engine\trainer: agnostic\_nms=False, amp=True, augment=False, auto\_augment=randaugment, batch=16, bgr=0.0, box=7.5, cache=False, cfg=None, c  
Overriding model.yaml nc=80 with nc=7

from	n	params	module	arguments
0	-1	1	464 ultralytics.nn.modules.conv.Conv	[3, 16, 3, 2]
1	-1	1	4672 ultralytics.nn.modules.conv.Conv	[16, 32, 3, 2]
2	-1	1	6640 ultralytics.nn.modules.block.C3k2	[32, 64, 1, False, 0.25]
3	-1	1	36992 ultralytics.nn.modules.conv.Conv	[64, 64, 3, 2]
4	-1	1	26080 ultralytics.nn.modules.block.C3k2	[64, 128, 1, False, 0.25]
5	-1	1	147712 ultralytics.nn.modules.conv.Conv	[128, 128, 3, 2]
6	-1	1	87040 ultralytics.nn.modules.block.C3k2	[128, 128, 1, True]
7	-1	1	295424 ultralytics.nn.modules.conv.Conv	[128, 256, 3, 2]
8	-1	1	346112 ultralytics.nn.modules.block.C3k2	[256, 256, 1, True]
9	-1	1	164608 ultralytics.nn.modules.block.SPPF	[256, 256, 5]
10	-1	1	249728 ultralytics.nn.modules.block.C2PSA	[256, 256, 1]
11	-1	1	0 torch.nn.modules.upsampling.Upsample	[None, 2, 'nearest']
12	[-1, 6]	1	0 ultralytics.nn.modules.conv.Concat	[1]
13	-1	1	111296 ultralytics.nn.modules.block.C3k2	[384, 128, 1, False]
14	-1	1	0 torch.nn.modules.upsampling.Upsample	[None, 2, 'nearest']

New <https://pypi.org/project/ultralytics/8.3.233> available Update with 'pip install -U ultralytics'

Ultralytics 8.3.230 Python-3.13.9 torch-2.9.1+cpu CPU (11th Gen Intel Core i7-1195G7 @ 2.90GHz)

mengine\trainer: [0agnostic\_nms=False, amp=True, augment=False, 1]m[34]  
auto\_augment=randaugment, batch=16, bgr=0.0, box=7.5, cache=False, cfg=None, classes=None, close\_mosaic=10, cls=0.5, compile=False, conf=None, copy\_paste=0.0, copy\_paste\_mode=flip, cos\_lr=False, cutmix=0.0, data=C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\data.yaml, degrees=0.0, deterministic=True, device=cpu, dfl=1.5, dnn=False, dropout=0.0, dynamic=False, embed=None, epochs=25, erasing=0.4, exist\_ok=False, fliplr=0.5, flipud=0.0, format=torchscript, fraction=1.0, freeze=None, half=False, hsv\_h=0.015, hsv\_s=0.7, hsv\_v=0.4, imgsz=640, int8=False, iou=0.7, keras=False, kobj=1.0, line\_width=None, lr0=0.01, lrf=0.01, mask\_ratio=4, max\_det=300, mixup=0.0, mode=train, model=yolo11n.pt, momentum=0.937, mosaic=1.0, multi\_scale=False, name=train8, nbs=64, nms=False, opset=None, optimize=False, optimizer=auto, overlap\_mask=True, patience=100, perspective=0.0, plots=True, pose=12.0, pretrained=True, profile=False, project=None, rect=False, resume=False, retina\_masks=False, save=True, save\_conf=False, save\_crop=False, save\_dir=C:\Users\96650\Downloads\runs\detect\train8, save\_frames=False, save\_json=False, save\_period=-1, save\_txt=False, scale=0.5, seed=0, shear=0.0, show=False, show\_boxes=True, show\_conf=True, show\_labels=True, simplify=True, single\_cls=False, source=None, split=val, stream\_buffer=False, task=detect, time=None, tracker=botsort.yaml, translate=0.1, val=True, verbose=True, vid\_stride=1, visualize=False, warmup\_bias\_lr=0.1, warmup\_epochs=3.0, warmup\_momentum=0.8, weight\_decay=0.0005, workers=8, workspace=None

Overriding model.yaml nc=80 with nc=7

```

from n  params module           arguments
[2 ,3 ,16 ,3]      ultralytics.nn.modules.conv.Conv 464    1 1-      0
[2 ,3 ,32 ,16]      ultralytics.nn.modules.conv.Conv 4672   1 1-      1
ultralytics.nn.modules.block.C3k2 [32, 64, 1, False, 6640   1 1-      2
0.25]
[2 ,3 ,64 ,64]      ultralytics.nn.modules.conv.Conv 36992  1 1-      3
ultralytics.nn.modules.block.C3k2 [64, 128, 1, False, 26080  1 1-      4
0.25]
[2 ,3 ,128 ,128]     ultralytics.nn.modules.conv.Conv 147712 1 1-      5
ultralytics.nn.modules.block.C3k2 [128, 128, 1, True] 87040  1 1-      6
[2 ,3 ,256 ,128]     ultralytics.nn.modules.conv.Conv 295424 1 1-      7
ultralytics.nn.modules.block.C3k2 [256, 256, 1, 346112 1 1-      8
True]
[5 ,256 ,256]      ultralytics.nn.modules.block.SPPF 164608 1 1-      9
[1 ,256 ,256]      ultralytics.nn.modules.block.C2PSA 249728 1 1-      10
torch.nn.modules.upsampling.Upsample [None, 2, 0      1 1-      11
'nearest']
[1]      ultralytics.nn.modules.conv.Concat 0      1 [6 ,1-]      12
ultralytics.nn.modules.block.C3k2 [384, 128, 1, 111296 1 1-      13
False]
torch.nn.modules.upsampling.Upsample [None, 2, 0      1 1-      14
'nearest']
[1]      ultralytics.nn.modules.conv.Concat 0      1 [4 ,1-]      15
ultralytics.nn.modules.block.C3k2 [256, 64, 1, 32096 1 1-      16
False]
[2 ,3 ,64 ,64]      ultralytics.nn.modules.conv.Conv 36992  1 1-      17
[1]      ultralytics.nn.modules.conv.Concat 0      1 [13 ,1-]     18
ultralytics.nn.modules.block.C3k2 [192, 128, 1, 86720  1 1-      19
False]
[2 ,3 ,128 ,128]     ultralytics.nn.modules.conv.Conv 147712 1 1-      20
[1]      ultralytics.nn.modules.conv.Concat 0      1 [10 ,1-]     21
ultralytics.nn.modules.block.C3k2 [384, 256, 1, 378880 1 1-      22
True]

```

```
,64] ,7]      ultralytics.nn.modules.head.Detect 432037  1 [22 ,19 ,16]      23  
[[256 ,128
```

YOLO11n summary: 181 layers, 2,591,205 parameters, 2,591,189 gradients, 6.4 GFLOPs

Transferred 448/499 items from pretrained weights

'Freezing layer 'model.23.dfl.conv.weight

```
mtrain: [0mFast image access (ping: 0.10.0 ms, read: 8.94.6 MB/s, size: 99.8 1]m[34]□  
(KB
```

```
mtrain: [0mScanning C:\Users\96650\Downloads\Aquarium 1]m[34]K[34]□  
Combined.v2-raw-1024.yolov11\train\labels.cache... 448 images, 1 backgrounds, 0  
corrupt: 100% ━━━━━━━━━━━━━━ 448/448 463.7Kit/s 0.0s
```

```
mval: [0mFast image access (ping: 0.10.0 ms, read: 8.94.9 MB/s, size: 91.3 1]m[34]□  
(KB
```

```
mval: [0mScanning C:\Users\96650\Downloads\Aquarium Combined.v2-1]m[34]K[34]□  
raw-1024.yolov11\valid\labels.cache... 127 images, 0 backgrounds, 0 corrupt: 100% ━  
127/127 97.3Kit/s 0.0s
```

...Plotting labels to C:\Users\96650\Downloads\runs\detect\train8\labels.jpg

```
moptimizer:[0m 'optimizer=auto' found, ignoring 'lr0=0.01' and 1]m[34]□  
'momentum=0.937' and determining best 'optimizer', 'lr0' and 'momentum'  
...automatically
```

```
moptimizer:[0m AdamW(lr=0.000909, momentum=0.9) with parameter 1]m[34]□  
(groups 81 weight(decay=0.0), 88 weight(decay=0.0005), 87 bias(decay=0.0
```

Image sizes 640 train, 640 val

Using 0 dataloader workers

```
m0]Logging results to [1mC:\Users\96650\Downloads\runs\detect\train8]
```

...Starting training for 25 epochs

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size	
K	1/25	0G	1.549	3.819	1.253	211	640: 100% ━━━━━━━━━━━━ ]□
							28/28 8.8s/it 4:059.1ss
K		Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ━
							4/4 6.1s/it 24.4s8.9s3s
all	127	909	0.0176	0.543	0.066	0.0386	

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
-------	---------	----------	----------	----------	-----------	------

```
K 2/25 0G 1.627 3.027 1.272 146 640: 100% ━━━━━━ ]□  
———— 28/28 8.2s/it 3:507.8ss  
  
K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 5.2s/it 20.9s7.7s4s  
  
all 127 909 0.012 0.577 0.0928 0.0461
```

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
K 3/25	0G	1.669	2.525	1.319	123	640: 100% ━━━━━━ ]□
———— 28/28 7.4s/it 3:286.1ss						
K	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ━━━━ ]□
———— 4/4 6.1s/it 24.5s8.7ss						
all	127	909	0.501	0.0661	0.163	0.0834

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
K 4/25	0G	1.602	2.16	1.289	206	640: 100% ━━━━━━ ]□
———— 28/28 7.8s/it 3:398.4ss						
K	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ━━━━ ]□
———— 4/4 6.5s/it 26.1s9.7s7s						
all	127	909	0.252	0.291	0.227	0.115

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
K 5/25	0G	1.592	2.017	1.265	177	640: 100% ━━━━━━ ]□
———— 28/28 8.4s/it 3:568.6ss						
K	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ━━━━ ]□
———— 4/4 5.4s/it 21.5s8.3s4s						
all	127	909	0.52	0.337	0.317	0.167

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
K 6/25	0G	1.553	1.898	1.267	211	640: 100% ━━━━━━ ]□
———— 28/28 55.6s/it 25:5733.4s						
K	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 50% ━━━━ ]□
———— 2/4 21.1s/it 23.8s<42.1sWARNING NMS time limit 3.600s exceeded						
K	Class	Images	Instances	Box(P	R	mAP50 mAP50-95): 100% ━━━━ ]□
———— 4/4 11.0s/it 44.1s16.3s						

all 127 909 0.484 0.457 0.399 0.205

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size  
K 7/25 0G 1.545 1.894 1.244 229 640: 100% ━━━━━━ ]□  
———— 28/28 14.6s/it 6:4814.7s

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 11.3s/it 45.1s17.1s

all 127 909 0.443 0.469 0.432 0.244

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size  
K 8/25 0G 1.511 1.745 1.24 177 640: 100% ━━━━━━ ]□  
———— 28/28 14.4s/it 6:4314.4s

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 9.7s/it 38.9s<14.3s

all 127 909 0.579 0.499 0.542 0.306

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size  
K 9/25 0G 1.491 1.644 1.226 198 640: 100% ━━━━━━ ]□  
———— 28/28 10.5s/it 4:55.6ss

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 4.3s/it 17.1s6.4s

all 127 909 0.547 0.542 0.533 0.302

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size  
K 10/25 0G 1.457 1.648 1.203 187 640: 100% ━━━━━━ ]□  
———— 28/28 6.4s/it 2:596.8ss

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 4.0s/it 15.8s5.7ss

all 127 909 0.564 0.556 0.564 0.314

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size  
K 11/25 0G 1.428 1.585 1.211 170 640: 100% ━━━━━━ ]□  
———— 28/28 6.1s/it 2:516.2ss

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ]□  
——— 4/4 4.1s/it 16.4s6.0ss

all 127 909 0.686 0.528 0.582 0.33

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

K 12/25 0G 1.422 1.489 1.174 222 640: 100% ]□  
——— 28/28 5.9s/it 2:456.0ss

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ]□  
——— 4/4 4.1s/it 16.5s6.0ss

all 127 909 0.728 0.514 0.569 0.318

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

K 13/25 0G 1.431 1.447 1.181 193 640: 100% ]□  
——— 28/28 6.2s/it 2:556.4ss

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ]□  
——— 4/4 4.2s/it 16.9s6.2ss

all 127 909 0.748 0.535 0.611 0.357

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

K 14/25 0G 1.422 1.409 1.182 168 640: 100% ]□  
——— 28/28 6.1s/it 2:505.7ss

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ]□  
——— 4/4 4.2s/it 16.9s6.4ss

all 127 909 0.689 0.594 0.619 0.353

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

K 15/25 0G 1.354 1.41 1.159 161 640: 100% ]□  
——— 28/28 6.4s/it 2:586.5ss

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ]□  
——— 4/4 3.9s/it 15.8s6.2ss

all 127 909 0.732 0.626 0.658 0.385

Closing dataloader mosaic

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

K 16/25 0G 1.348 1.482 1.156 124 640: 100% ━━━━━━ ]□  
———— 28/28 6.2s/it 2:546.5ss

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 4.4s/it 17.6s6.8ss

all 127 909 0.698 0.587 0.636 0.37

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

K 17/25 0G 1.311 1.365 1.147 138 640: 100% ━━━━━━ ]□  
———— 28/28 6.4s/it 2:596.4ss

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 4.1s/it 16.4s6.0ss

all 127 909 0.722 0.595 0.68 0.397

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

K 18/25 0G 1.284 1.315 1.133 101 640: 100% ━━━━━━ ]□  
———— 28/28 28.5s/it 13:1835.4s

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 21.7s/it 1:2732.7s

all 127 909 0.707 0.652 0.693 0.405

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

K 19/25 0G 1.287 1.28 1.118 114 640: 100% ━━━━━━ ]□  
———— 28/28 36.4s/it 16:6034.6s

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 17.9s/it 1:12<27.3s

all 127 909 0.779 0.61 0.709 0.416

Epoch GPU\_mem box\_loss cls\_loss dfl\_loss Instances Size

K 20/25 0G 1.265 1.236 1.119 82 640: 100% ━━━━━━ ]□  
———— 28/28 33.4s/it 15:3632.9s

K Class Images Instances Box(P R mAP50 mAP50-95): 100% ━━━━ ]□  
———— 4/4 17.2s/it 1:09<25.8s

all 127 909 0.779 0.633 0.712 0.427

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
K 21/25	0G	1.237	1.177	1.108	111	640: 100% ━━━━━━ ]□
—————	—————	28/28	30.0s/it	13:59.7s0s		
K	Class	Images	Instances	Box(P)	R	mAP50 mAP50-95): 100% ━━━━ ]□
—————	—————	4/4	3.9s/it	15.5s5.7ss		
all	127	909	0.753	0.656	0.725	0.428

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
K 22/25	0G	1.229	1.183	1.094	139	640: 100% ━━━━━━ ]□
—————	—————	28/28	33.0s/it	15:2435.3s		
K	Class	Images	Instances	Box(P)	R	mAP50 mAP50-95): 100% ━━━━ ]□
—————	—————	4/4	17.8s/it	1:11<26.1s		
all	127	909	0.719	0.684	0.704	0.412

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
K 23/25	0G	1.221	1.142	1.085	105	640: 100% ━━━━━━ ]□
—————	—————	28/28	34.5s/it	16:0733.6s		
K	Class	Images	Instances	Box(P)	R	mAP50 mAP50-95): 100% ━━━━ ]□
—————	—————	4/4	17.7s/it	1:11<26.6s		
all	127	909	0.743	0.668	0.728	0.428

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
K 24/25	0G	1.216	1.146	1.081	90	640: 100% ━━━━━━ ]□
—————	—————	28/28	33.9s/it	15:4933.7s		
K	Class	Images	Instances	Box(P)	R	mAP50 mAP50-95): 100% ━━━━ ]□
—————	—————	4/4	17.2s/it	1:09<25.5s		
all	127	909	0.787	0.649	0.734	0.441

Epoch	GPU_mem	box_loss	cls_loss	dfl_loss	Instances	Size
K 25/25	0G	1.197	1.12	1.084	86	640: 100% ━━━━━━ ]□
—————	—————	28/28	34.9s/it	16:1834.0s		
K	Class	Images	Instances	Box(P)	R	mAP50 mAP50-95): 100% ━━━━ ]□
—————	—————	4/4	17.4s/it	1:10<26.6s		
all	127	909	0.694	0.731	0.735	0.441

.epochs completed in 3.766 hours 25

Optimizer stripped from C:\Users\96650\Downloads\runs\detect\train8\weights\last.pt,  
5.5MB

Optimizer stripped from  
C:\Users\96650\Downloads\runs\detect\train8\weights\best.pt, 5.5MB

...Validating C:\Users\96650\Downloads\runs\detect\train8\weights\best.pt

Ultralytics 8.3.230 Python-3.13.9 torch-2.9.1+cpu CPU (11th Gen Intel Core i7-1195G7  
@ 2.90GHz)

YOLO11n summary (fused): 100 layers, 2,583,517 parameters, 0 gradients, 6.3 GFLOPs

K	Class	Images	Instances	Box(P)	R	mAP50	mAP50-95): 100%	—————]	□
<hr/>									
		4/4	12.7s/it	50.7s	19.6s				
all	127	909	0.785	0.651	0.733	0.441			
fish	63	459	0.855	0.653	0.803	0.452			
jellyfish	9	155	0.816	0.861	0.896	0.492			
penguin	17	104	0.632	0.702	0.665	0.313			
puffin	15	74	0.599	0.338	0.454	0.228			
shark	28	57	0.769	0.614	0.684	0.443			
starfish	17	27	0.895	0.633	0.769	0.556			
stingray	23	33	0.926	0.757	0.863	0.606			

Speed: 2.9ms preprocess, 314.1ms inference, 0.0ms loss, 38.7ms postprocess per  
image

m0]Results saved to ②[1mC:\Users\96650\Downloads\runs\detect\train8②

##### 5. Run Inference on Test Set & Save Results

```
test_results = model.predict(  
    source=r"C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images",  
    save=True,          # save images with bounding boxes  
    conf=0.25,  
)  
  
✓ 2m 38.9s
```

Python

image 1/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2289.jpeg.jpg.rf.fe2a7a149e7b11f2313f5a7b30386e85.  
image 2/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2301.jpeg.jpg.rf.2c19ae5efbd1f8611b5578125f001695.  
image 3/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2319.jpeg.jpg.rf.6e20bf97d17b74a8948aa48776c40454.  
image 4/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2347.jpeg.jpg.rf.7c71ac4b9301eb358cd4a832844dedcb.  
image 5/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2354.jpeg.jpg.rf.396e872c7fb0a95e911806986995ee7a.  
image 6/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2371.jpeg.jpg.rf.54505f60b6706da151c164188c305849.  
image 7/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2379.jpeg.jpg.rf.7dc3160c937072d26d4624c6c48e904d.  
image 8/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2380.jpeg.jpg.rf.a23809682eb1466c1136ca0f55de8fb5.  
image 9/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2387.jpeg.jpg.rf.0b38bacfab0922a3a6b66480f01b719.  
image 10/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2395.jpeg.jpg.rf.9f1503ad3b7a7c7938daed057cc4e9b.  
image 11/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2423.jpeg.jpg.rf.1c0901882e71d5ebd26f036f4e22da6.  
image 12/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2434.jpeg.jpg.rf.8b20d3270d4fbc497c64125273f46ec1.  
image 13/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2446.jpeg.jpg.rf.06ee05e92df8e3c38073147d8f59521.  
image 14/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2448.jpeg.jpg.rf.28ce79db47ad525751d540fbe09bc3c.  
image 15/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2450.jpeg.jpg.rf.ff673921373de3bf275863e3befefc.  
image 16/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2465.jpeg.jpg.rf.7e699ec1d2e373d93dac32cd02db943.  
image 17/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2466.jpeg.jpg.rf.53886abb9947ec4e47405957b30fe33.  
image 18/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2468.jpeg.jpg.rf.c933cc14c99b11a99413a1490d4556d1.  
image 19/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2470.jpeg.jpg.rf.75b359c8baa6866bfecf07a0e48c33.  
image 20/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2473.jpeg.jpg.rf.6284677f9c781b0cfeec54981a17d57.  
image 21/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2477.jpeg.jpg.rf.7b2692f142d53c16ad477065f1f8ae6c.  
image 22/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2496.jpeg.jpg.rf.3f91e7f18502074c89fa720a11926fa1.  
image 23/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2499.jpeg.jpg.rf.6chah2719h0063382b5ab3ab826d7hd.

image 1/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2289.jpeg.jpg.rf.fe2a7a149e7b11f2313f5a7b30386e85.  
jpg: 640x480 1 puffin, 2433.6ms

image 2/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2301.jpeg.jpg.rf.2c19ae5efbd1f8611b5578125f001695.  
jpg: 640x480 25 penguins, 2476.1ms

image 3/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2319.jpeg.jpg.rf.6e20bf97d17b74a8948aa48776c40454.  
jpg: 640x480 9 penguins, 3168.3ms

image 4/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2347.jpeg.jpg.rf.7c71ac4b9301eb358cd4a832844dedcb.  
jpg: 640x480 2 penguins, 1673.1ms

image 5/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2354.jpeg.jpg.rf.396e872c7fb0a95e911806986995ee7.  
a.jpg: 640x480 9 penguins, 1636.2ms

image 6/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2371.jpeg.jpg.rf.54505f60b6706da151c164188c305849.  
jpg: 640x480 3 fishs, 1575.1ms

image 7/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2379.jpeg.jpg.rf.7dc3160c937072d26d4624c6c48e904.  
d.jpg: 640x480 1 fish, 2454.8ms

image 8/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images\IMG\_2380.jpeg.jpg.rf.a23809682eb1466c1136ca0f55de8fb5.  
.jpg: 640x480 3 fishs, 1 starfish, 2472.0ms

image 9/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2387.jpeg.jpg.rf.09b38bacfab0922a3a6b66480f01b719  
.jpg: 640x480 1 starfish, 1898.9ms

image 10/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2395.jpeg.jpg.rf.9f1503ad3b7a7c7938daed057cc4e9b  
.jpg: 640x480 9 fishes, 3118.8ms

image 11/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2423.jpeg.jpg.rf.1c0901882e71d5ebd26f036f4e22da65  
.jpg: 640x480 18 fishes, 3 sharks, 956.0ms

image 12/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2434.jpeg.jpg.rf.8b20d3270d4fbca97c64125273f46ecb  
.jpg: 640x480 5 fishes, 1 shark, 2261.2ms

image 13/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2446.jpeg.jpg.rf.06ee05e92df8e3c33073147d8f595211  
.jpg: 640x480 6 fishes, 2 sharks, 2930.0ms

image 14/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2448.jpeg.jpg.rf.28ce79dab47ad525751d5407be09bc3  
d.jpg: 640x480 10 fishes, 5 sharks, 2882.1ms

image 15/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2450.jpeg.jpg.rf.ff673921373de3bfc275863e3befefe.j  
pg: 640x480 16 fishes, 3 sharks, 2514.0ms

image 16/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2465.jpeg.jpg.rf.7e699ec1d2e373d93dac32cd02db943  
8.jpg: 640x480 17 jellyfishs, 3376.3ms

image 17/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2466.jpeg.jpg.rf.53886abb9947ec4e47405957b30fe31  
4.jpg: 640x480 7 jellyfishs, 2319.8ms

image 18/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2468.jpeg.jpg.rf.c933cc14c99b11a90413a1490d4556d  
b.jpg: 640x480 7 jellyfishs, 2138.4ms

image 19/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2470.jpeg.jpg.rf.75b359c8baa6866bfecf07a0e4e8c33d  
.jpg: 640x480 17 jellyfishs, 3215.9ms

image 20/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2473.jpeg.jpg.rf.6284677f9c781b0cfec54981a17d573  
.jpg: 640x480 3 jellyfishs, 1853.8ms

image 21/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2477.jpeg.jpg.rf.7b2692f142d53c16ad477065f1f8ae6d.  
jpg: 640x480 8 jellyfishs, 2034.7ms

image 22/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2496.jpeg.jpg.rf.3f91e7f18502074c89fa720a11926fab.j  
pg: 640x480 8 fishes, 4 sharks, 1 stingray, 3263.5ms

image 23/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2499.jpeg.jpg.rf.6cbab3719b9063388b5ab3ab826d7bd  
3.jpg: 640x480 4 fishes, 1 shark, 1736.1ms

image 24/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2514.jpeg.jpg.rf.6ccb3859d75fc5cfe053b1c1474254b2  
.jpg: 640x480 2 sharks, 2023.3ms

image 25/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2526.jpeg.jpg.rf.003e1d1d41bcd204df731b85cea6878  
1.jpg: 640x480 8 puffins, 1668.1ms

image 26/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2532.jpeg.jpg.rf.2afeb76e5d9372dbbd6fbcc53d5b7567  
5.jpg: 640x480 2 starfishs, 2249.5ms

image 27/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2544.jpeg.jpg.rf.03f51bb9e1c57fb9cd62f8cbdca14e90.  
jpg: 640x480 4 fishes, 3 starfishs, 1209.3ms

image 28/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2547.jpeg.jpg.rf.9406b6f1a9fad2292c4abd28f712baaf.j  
pg: 640x480 5 starfishs, 2561.4ms

image 29/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2570.jpeg.jpg.rf.ed40900b657a5b23d92cb2d296ad2db  
c.jpg: 640x480 11 fishes, 3 sharks, 2637.7ms

image 30/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2574.jpeg.jpg.rf.ca0c3ad32384309a61e92d9a8bef87b  
9.jpg: 640x480 12 jellyfishs, 1407.1ms

image 31/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2582.jpeg.jpg.rf.14f175066ce74b470bf31fa0c7a096cd.  
jpg: 640x480 8 fishes, 3 sharks, 2835.2ms

image 32/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2588.jpeg.jpg.rf.cb9cea8f05891cf55a3e93f2908201f.j  
pg: 640x480 3 stingrays, 1093.7ms

image 33/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2630.jpeg.jpg.rf.310f0c986a72be46b80ce31c2d00e46  
d.jpg: 640x480 2 fishes, 1 stingray, 2859.9ms

image 34/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2632.jpeg.jpg.rf.f44037edca490b16cbf06427e28ea946  
.jpg: 640x480 5 fishes, 4 stingrays, 2095.4ms

image 35/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_2651.jpeg.jpg.rf.84b3930aa80b610cc97bf1c17676394  
0.jpg: 640x480 1 stingray, 2138.3ms

image 36/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_3129.jpeg.jpg.rf.90c472dcdf9b6713ec767cc97560cec  
a.jpg: 640x480 1 starfish, 1781.4ms

image 37/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_3134.jpeg.jpg.rf.50750ca778773042a3c46a1d3e48013  
2.jpg: 640x480 2 penguins, 2951.1ms

image 38/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_3136.jpeg.jpg.rf.0d8fef73d4cc5e1c35ce424444d9e44b  
.jpg: 640x480 18 puffins, 2934.3ms

image 39/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_3144.jpeg.jpg.rf.f29a36360174dc83ecef93275ed8f02e.  
jpg: 640x480 2 puffins, 2420.8ms

image 40/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_3154.jpeg.jpg.rf.5f429a366c02d38bc9e2217f4508c3e0  
.jpg: 640x480 1 puffin, 2731.4ms

image 41/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_3164.jpeg.jpg.rf.06637eee0b72df791aa729807ca45c4  
d.jpg: 640x480 23 penguins, 2830.0ms

image 42/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_3173.jpeg.jpg.rf.6f05acaa0b22d410a5df3ea3286e227d  
.jpg: 480x640 19 penguins, 2643.8ms

image 43/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_3175.jpeg.jpg.rf.686c7d36e049eea974a363e99bf0bee  
0.jpg: 480x640 16 penguins, 2426.4ms

image 44/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8331.jpg.rf.ec024bdf1e9de02b020b5e6505c1c58b.jpg:  
480x640 5 fishes, 2057.5ms

image 45/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8343.jpg.rf.2d88000497d74d72aedc118b125a0c07.jpg:  
480x640 5 fishes, 2788.5ms

image 46/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8395.jpg.rf.3bebece033961c9f665571644a14261f.jpg:  
480x640 5 fishes, 6 sharks, 2787.5ms

image 47/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8396.jpg.rf.106a6ced5c649ea81f0de8ecaa4ff3b8.jpg:  
480x640 5 fishes, 7 sharks, 2934.7ms

image 48/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8404.jpg.rf.265b89e862a375f6b89f781ea60ed480.jpg:  
480x640 12 fishes, 1 shark, 1 stingray, 2671.9ms

image 49/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8420.jpg.rf.31f1d5f1440e48ccf1dee988b565911b.jpg:  
480x640 16 fishes, 2540.6ms

image 50/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8452.jpg.rf.6bbff701ab93e29553b3a70137fd4e66.jpg:  
480x640 48 fishes, 2 sharks, 2587.4ms

image 51/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8490.jpg.rf.1836542cf054c6d303a2dd05d4194d7f.jpg:  
480x640 70 jellyfishs, 2889.1ms

image 52/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8497\_MOV-  
0.jpg.rf.5c59bd1bf7d8fd7a20999d51a79a12c0.jpg: 640x384 10 fishes, 3037.0ms

image 53/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8497\_MOV-  
3.jpg.rf.fd813e14681c8b41e709a500748ce46a.jpg: 640x384 10 fishes, 4405.3ms

image 54/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8497\_MOV-  
5.jpg.rf.3deffb208d656b7845661c5e33dd1afb.jpg: 640x384 9 fishes, 1691.4ms

image 55/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8513\_MOV-  
0.jpg.rf.2a2f77e3f73630b60AAF6ad3ca4ed130.jpg: 640x384 5 fishes, 1513.0ms

image 56/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8515.jpg.rf.98a9daca7c5a5bad9872bd7fb2d4f198.jpg:  
480x640 7 fishes, 3108.7ms

image 57/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8582\_MOV-  
0.jpg.rf.aa8304d7a5112d63c8841d96160d42cd.jpg: 640x384 6 fishes, 1 stingray,  
763.0ms

image 58/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8582\_MOV-  
3.jpg.rf.c7dde0639837077f76428d70223368a4.jpg: 640x384 1 fish, 2099.4ms

image 59/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8582\_MOV-  
5.jpg.rf.9d7a26fbf145ce39ab0831b4e6bc1f1e.jpg: 640x384 1 fish, 1 stingray, 1654.0ms

image 60/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-  
1024.yolov11\test\images\IMG\_8590\_MOV-  
2.jpg.rf.2136fdb5dcbcd58a1dc456bb3e5bf476.jpg: 640x384 2 jellyfishs, 1 stingray,  
2693.1ms

```
image 61/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-
1024.yolov11\test\images\IMG_8590_MOV-
5.jpg.rf.074e6d8acdd3fcad16d866c341b43769.jpg: 640x384 1 stingray, 1476.0ms

image 62/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-
1024.yolov11\test\images\IMG_8595_MOV-
0.jpg.rf.312ab0b8b9fca18134aee88044f45a06.jpg: 640x384 54 jellyfishs, 1892.3ms

image 63/63 C:\Users\96650\Downloads\Aquarium Combined.v2-raw-
1024.yolov11\test\images\IMG_8599_MOV-
3.jpg.rf.412ebb16ea80e964b4464c50e757df0e.jpg: 640x384 4 jellyfishs, 2108.5ms

Speed: 68.6ms preprocess, 2342.6ms inference, 16.3ms postprocess per image at
(384 ,640 ,3 ,1) shape
```

m0]Results saved to ②[1mC:\Users\96650\Downloads\runs\detect\predict2②

```
6. Display Detection Images with their bounding boxes

import os
import random
import matplotlib.pyplot as plt

# Path to the results folder
results_path = r"C:\Users\96650\Downloads\runs\detect\predict"

# Get the names of the images
image_files = [os.path.join(results_path, f) for f in os.listdir(results_path) if f.endswith('.jpg', '.png')]

# Select 5 random images
random_images = random.sample(image_files, min(5, len(image_files)))

# Display the random images
for i, img_path in enumerate(random_images):
    img = plt.imread(img_path)
    plt.figure(figsize=(8, 8))
    plt.imshow(img)
    plt.axis('off')
    plt.title(f" Image {i+1}")
    plt.show()

✓ 2.7s
```

Python

Image 1



Image 2

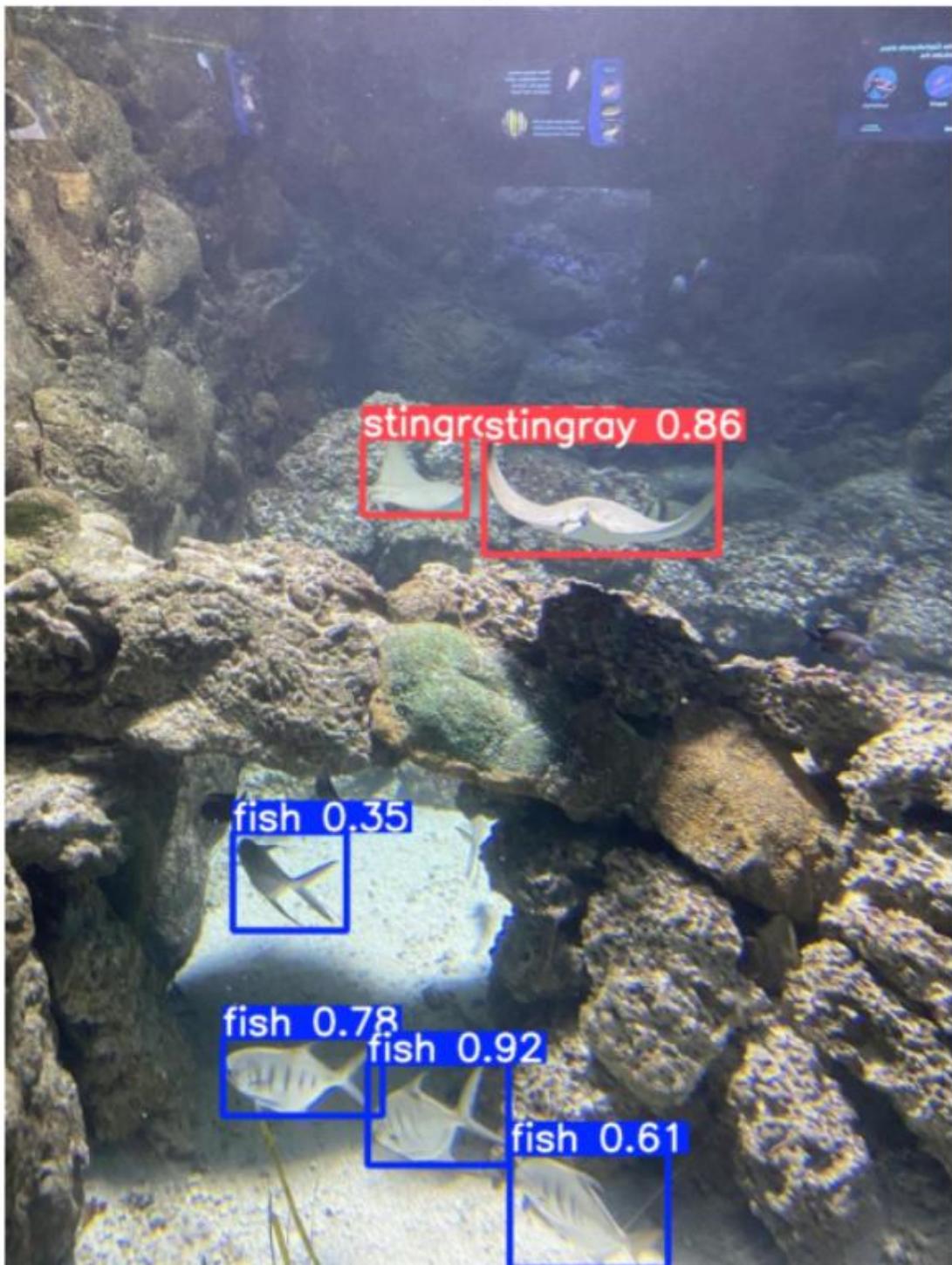


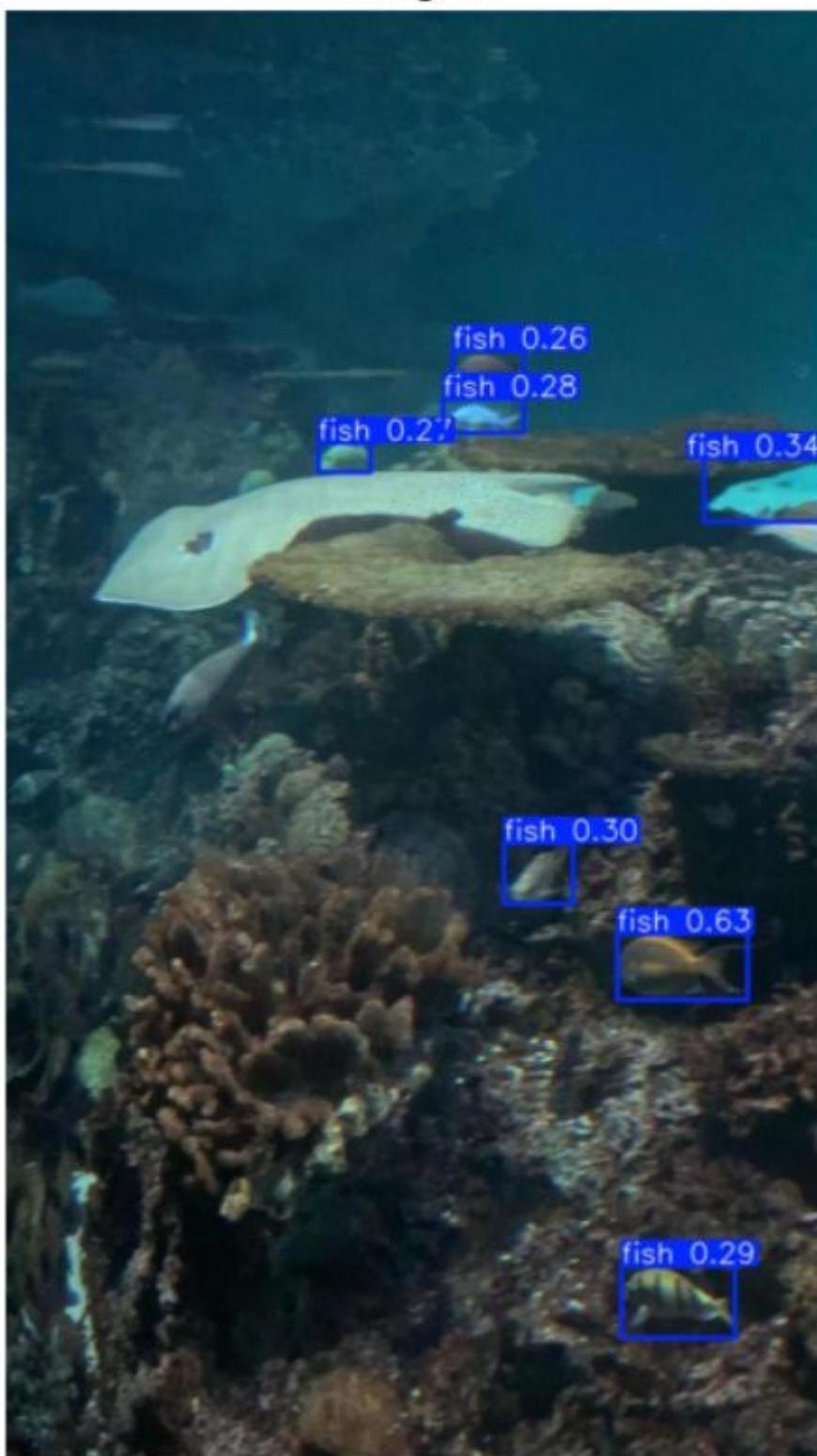
Image 3



Image 4



Image 5



## 7. Display confusion matrix

```

metrics = model.val(data = r"C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\data.yaml")

print("Confusion Matrix saved at:", metrics.save_dir)
display(Image(filename=f"{metrics.save_dir}/confusion_matrix.png"))

Python
✓ 1m 43.4s

Ultralytics 8.3.230 Python-3.13.9 torch-2.9.1+cpu CPU (11th Gen Intel Core i7-1195G7 @ 2.90GHz)
val: Fast image access (ping: 0.10.0 ms, read: 53.220.6 MB/s, size: 100.9 KB)
val: Scanning C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\valid\labels.cache... 127 images, 0 backgrounds, 0 corrupt: 100% ━━━━━━━━━━ 8/8 12.2s/it 1:381.1s
    Class   Images Instances   Box(P)      R     mAP50   mAP50-95: 100% ━━━━━━━━━━ 8/8 12.2s/it 1:381.1s
      all     127      909   0.786   0.658   0.735   0.442
      fish     63      459   0.849   0.662   0.8   0.451
jellyfish      9      155   0.825   0.884   0.908   0.487
  penguin     17      104   0.631   0.702   0.665   0.313
  puffin      15       74   0.605   0.351   0.46   0.236
    shark     28       57   0.768   0.614   0.684   0.444
 starfish     17       27   0.896   0.636   0.769   0.556
  stingray     23       33   0.926   0.757   0.858   0.608
Speed: 6.3ms preprocess, 593.2ms inference, 0.0ms loss, 53.3ms postprocess per image
Results saved to C:\Users\96650\Downloads\runs\detect\vals
Confusion Matrix saved at: C:\Users\96650\Downloads\runs\detect\vals

```

Ultralytics 8.3.230 Python-3.13.9 torch-2.9.1+cpu CPU (11th Gen Intel Core i7-1195G7 @ 2.90GHz)

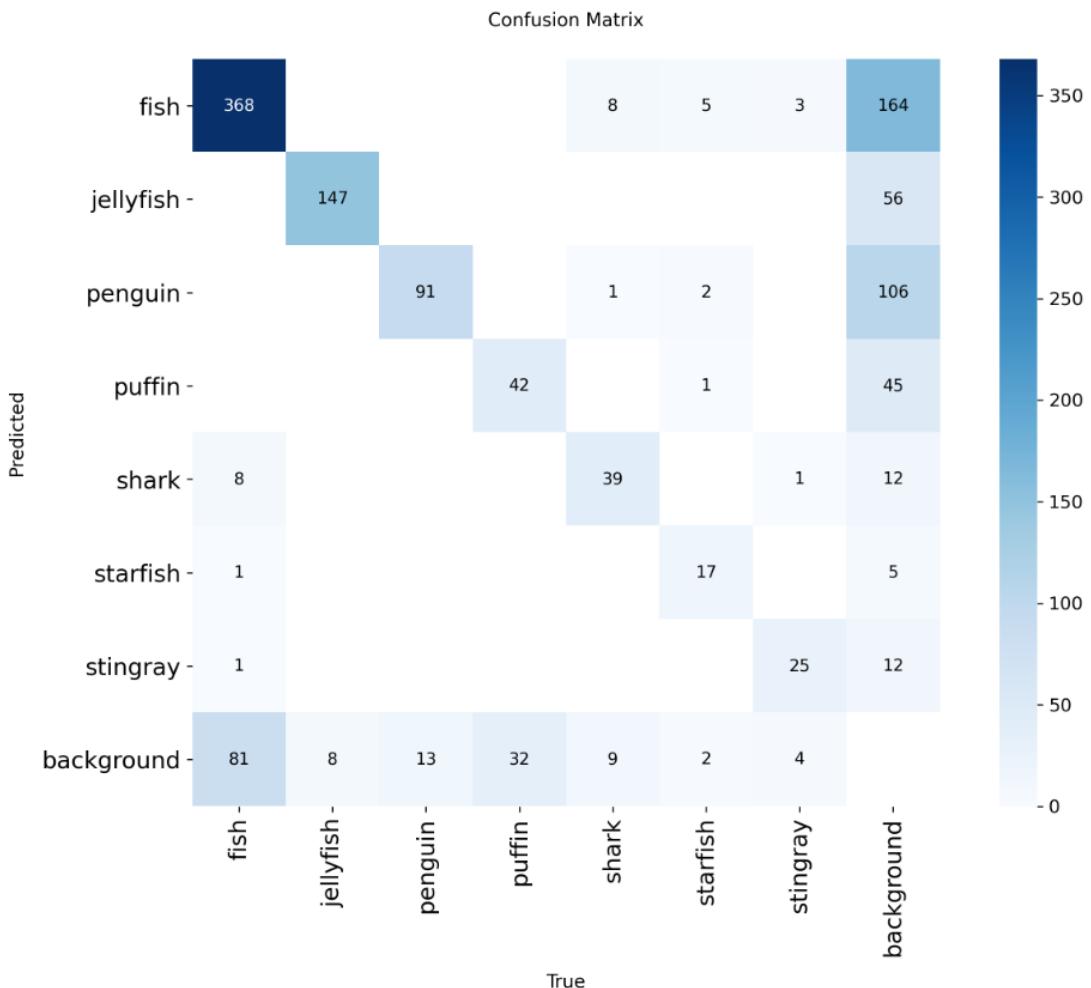
mval: 0mFast image access (ping: 0.10.0 ms, read: 53.220.6 MB/s, size: 1)m34] (100.9 KB

mval: 0mScanning C:\Users\96650\Downloads\Aquarium Combined.v2-1]m34]K raw-1024.yolov11\valid\labels.cache... 127 images, 0 backgrounds, 0 corrupt: 100% ————— 127/127 72.7Kit/s 0.0s

K	Class	Images	Instances	Box(P)	R	mAP50	mAP50-95): 100%	—]□
<hr/> 8/8 12.2s/it 1:3812.1s								
all	127	909	0.786	0.658	0.735	0.442		
fish	63	459	0.849	0.662	0.8	0.451		
jellyfish	9	155	0.825	0.884	0.908	0.487		
penguin	17	104	0.631	0.702	0.665	0.313		
puffin	15	74	0.605	0.351	0.46	0.236		
shark	28	57	0.768	0.614	0.684	0.444		
starfish	17	27	0.896	0.636	0.769	0.556		
stingray	23	33	0.926	0.757	0.858	0.608		

Speed: 6.3ms preprocess, 593.2ms inference, 0.0ms loss, 53.3ms postprocess per image

m0]Results saved to [1mC:\Users\96650\Downloads\runs\detect\val5]

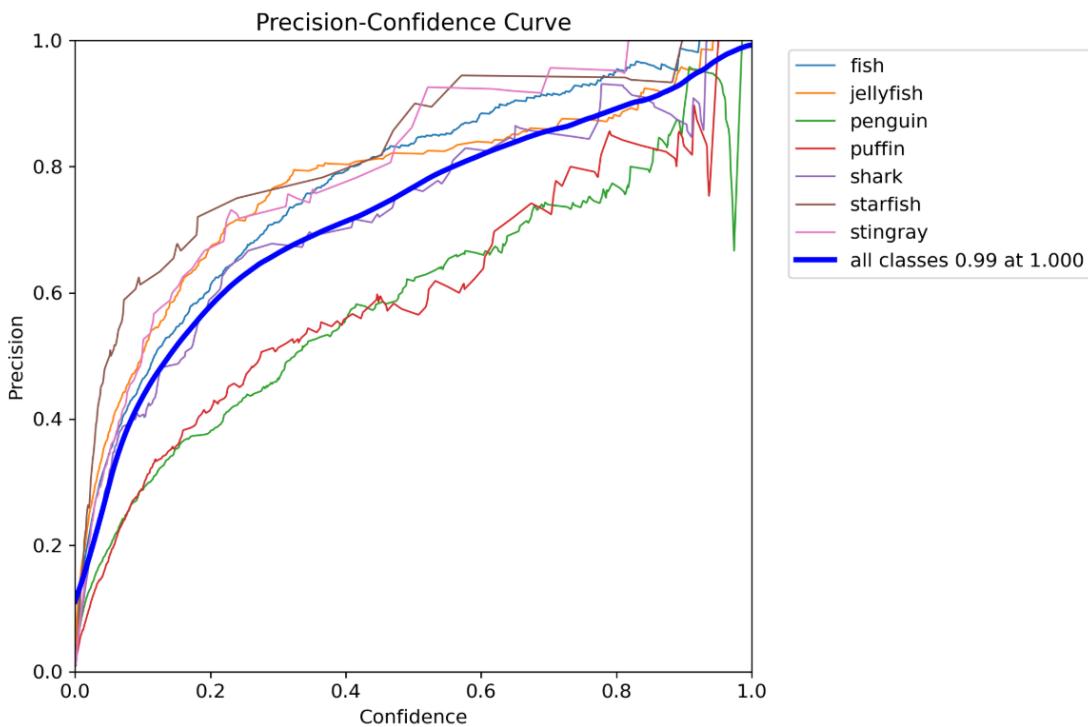


#### 8. display Precision–Confidence Curve

```
display(Image(filename=f"{metrics.save_dir}/BoxP_curve.png"))
```

✓ 0.0s

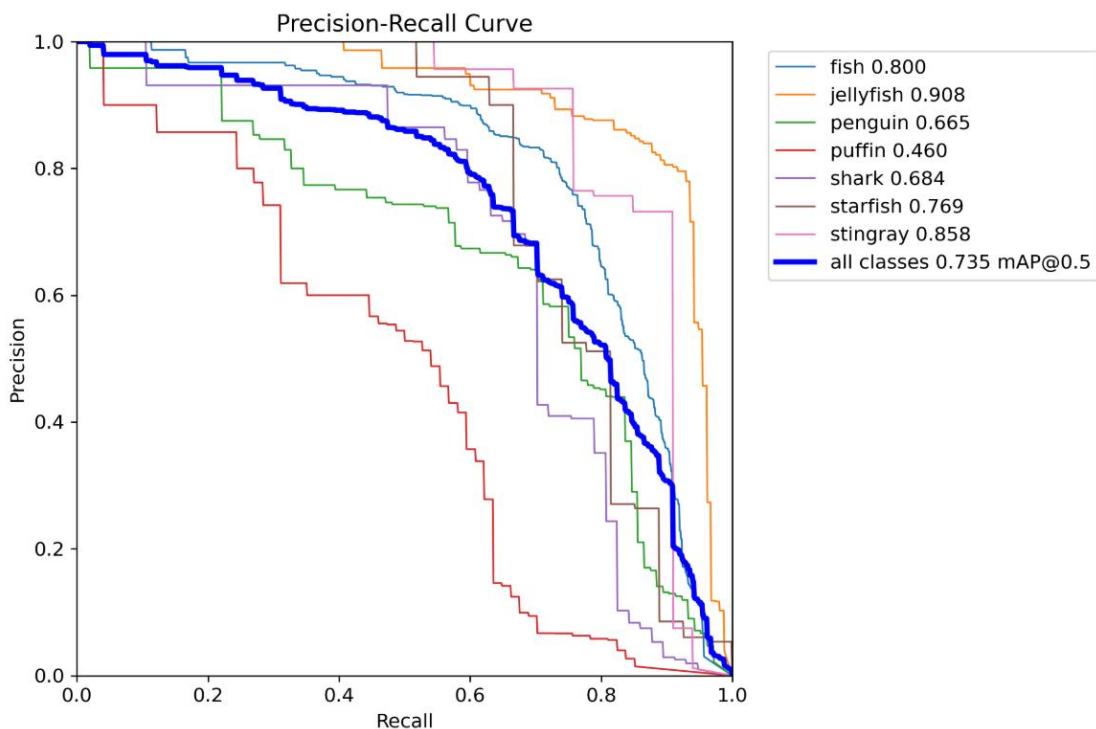
Python



## 9. display Precision–Recall Curve

```
display(Image(filename=f'{metrics.save_dir}/BoxPR_curve.png'))  
0.1s
```

Python



```
import os

metrics_dir = r"C:\Users\96650\Downloads\runs\detect\val4"
print(os.listdir(metrics_dir))

✓ 0.0s
['BoxF1_curve.png', 'BoxPR_curve.png', 'BoxP_curve.png', 'BoxR_curve.png', 'confusion_matrix.png', 'confusion_matrix_normalized.p
Python
```

```
BoxF1_curve.png', 'BoxPR_curve.png', 'BoxP_curve.png', 'BoxR_curve.png', ]
'confusion_matrix.png', 'confusion_matrix_normalized.png', 'val_batch0_labels.jpg',
'val_batch0_pred.jpg', 'val_batch1_labels.jpg', 'val_batch1_pred.jpg',
["val_batch2_labels.jpg", 'val_batch2_pred.jpg
```

#### 10. Calculate Inference Time

```
import numpy as np

# Load your YOLOv11 model
model = YOLO(r"C:\Users\96650\Downloads\yolo11.pt")    # change to your weights

# Path to test images
test_path = r"C:\Users\96650\Downloads\Aquarium Combined.v2-raw-1024.yolov11\test\images"

# List all image files
image_files = [os.path.join(test_path, f)
               for f in os.listdir(test_path)
               if f.lower().endswith(('.jpg', '.png', '.jpeg'))]

times = []

print("⌚ Measuring inference time...\n")

for img in image_files:
    start = time.time()

    model.predict(img, imgsz=640, conf=0.25, verbose=False)

    end = time.time()
    inference_time = end - start
    times.append(inference_time)

    print(f"🖼 {os.path.basename(img)} → {inference_time:.4f} sec")

# Total inference time
total_time = np.sum(times)
```

Python

```
# Average inference time
avg_time = np.mean(times)

print("\n=====")
print("👉 Total Images: {len(image_files)}")
print("⌚ Total Inference Time: {total_time:.4f} sec")
print("⚡ Average Inference Time per Image: {avg_time:.4f} sec")
print("=====")
```

Python

```
🖼 IMG_3154.jpeg.jpg.rf.5f429a366c02d38bc9e2217f4508c3e0.jpg → 0.0878 sec
🖼 IMG_3164.jpeg.jpg.rf.06637eee0b72df791aa729807ca45c4d.jpg → 0.1036 sec
🖼 IMG_3173.jpeg.jpg.rf.6f05acaab22d410a5df3ea328e227d.jpg → 0.0881 sec
🖼 IMG_3175.jpeg.jpg.rf.686c7d36e049ee974a363e99bf0bee0.jpg → 0.0904 sec
🖼 IMG_8331.jpeg.rf.ec024bdfe1e9de02b0b5e6505c1c58b.jpg → 0.1037 sec
🖼 IMG_8343.jpeg.rf.2d88000497d74d72aedc118b125a0c07.jpg → 0.0962 sec
🖼 IMG_8395.jpeg.rf.3bebece033961c9f665571644a14261f.jpg → 0.1089 sec
🖼 IMG_8396.jpeg.rf.106a6ced5c649ea81f0de8ecaa4ff3b8.jpg → 0.1163 sec
🖼 IMG_8404.jpeg.rf.265b89e862a375f6b89f781ea6eed480.jpg → 0.1065 sec
🖼 IMG_8420.jpeg.rf.31f1d5f1440e48ccf1dee988b565911b.jpg → 0.0851 sec
🖼 IMG_8452.jpeg.rf.6bbff701ab93e29553b3a70137fd4e66.jpg → 0.1073 sec
🖼 IMG_8490.jpeg.rf.1836542cf054c6d303a2dd05d4194d7f.jpg → 0.1147 sec
🖼 IMG_8497_MOV-0.jpeg.rf.5c59bd1bf7d8fd7a20999d51a79a12c0.jpg → 0.0928 sec
🖼 IMG_8497_MOV-3.jpeg.rf.fd813e14681c8b41e709a500748ce46a.jpg → 0.0855 sec
🖼 IMG_8497_MOV-5.jpeg.rf.3deffb208d656b7845661c5e33dd1afb.jpg → 0.0723 sec
🖼 IMG_8513_MOV-0.jpeg.rf.2a2f77e3f73630b60aaf6ad3ca4ed130.jpg → 0.0835 sec
🖼 IMG_8515.jpeg.rf.98a9daca7c5a5bad9872bd7fb2d4f198.jpg → 0.0953 sec
🖼 IMG_8582_MOV-0.jpeg.rf.aa8304d7a5112d63c8841d96160d42cd.jpg → 0.0882 sec
🖼 IMG_8582_MOV-3.jpeg.rf.c7dde0639837077f76428d7022336844.jpg → 0.0977 sec
🖼 IMG_8582_MOV-5.jpeg.rf.9d7a26fb145ce39ab0831b4e6bc1f1e.jpg → 0.0891 sec
🖼 IMG_8590_MOV-2.jpeg.rf.2136fdb5dcba58a1dc456bb3e5bf476.jpg → 0.0817 sec
🖼 IMG_8590_MOV-5.jpeg.rf.074e6d8acdd3fcad16d866c341b43769.jpg → 0.0864 sec
🖼 IMG_8595_MOV-0.jpeg.rf.312abb8b9fc1a813a4ee88044f45a66.jpg → 0.0883 sec
🖼 IMG_8599_MOV-3.jpeg.rf.412ebbb16ea80e964b4464c50e757df0e.jpg → 0.0865 sec
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...Measuring inference time 🔎

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IMG\_2301.jpeg.jpg.rf.2c19ae5efbd1f8611b5578125f001695.jpg → 0.1046 sec 

IMG\_2319.jpeg.jpg.rf.6e20bf97d17b74a8948aa48776c40454.jpg → 0.1076 sec 

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- IMG\_2466.jpeg.jpg.rf.53886abb9947ec4e47405957b30fe314.jpg → 0.1023 sec 
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- IMG\_2473.jpeg.jpg.rf.6284677f9c781b0cfec54981a17d573.jpg → 0.1094 sec 
- IMG\_2477.jpeg.jpg.rf.7b2692f142d53c16ad477065f1f8ae6d.jpg → 0.0938 sec 
- IMG\_2496.jpeg.jpg.rf.3f91e7f18502074c89fa720a11926fab.jpg → 0.1450 sec 
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- IMG\_2526.jpeg.jpg.rf.003e1d1d41bcd204df731b85cea68781.jpg → 0.0909 sec 
- IMG\_2532.jpeg.jpg.rf.2afeb76e5d9372dbbd6fb53d5b75675.jpg → 0.0992 sec 
- IMG\_2544.jpeg.jpg.rf.03f51bb9e1c57fb9cd62f8cbdca14e90.jpg → 0.0946 sec 
- IMG\_2547.jpeg.jpg.rf.9406b6f1a9fad2292c4abd28f712baaf.jpg → 0.0976 sec 
- IMG\_2570.jpeg.jpg.rf.ed40900b657a5b23d92cb2d296ad2dbc.jpg → 0.1032 sec 
- IMG\_2574.jpeg.jpg.rf.ca0c3ad32384309a61e92d9a8bef87b9.jpg → 0.0944 sec 
- IMG\_2582.jpeg.jpg.rf.14f175066ce74b470bf31fa0c7a096cd.jpg → 0.0908 sec 
- IMG\_2588.jpeg.jpg.rf.cb9cea8f05891cf55a3e93f2908201f.jpg → 0.1003 sec 
- IMG\_2630.jpeg.jpg.rf.310f0c986a72be46b80ce31c2d00e46d.jpg → 0.0936 sec 

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- IMG\_3129.jpeg.jpg.rf.90c472dcdf9b6713ec767cc97560ceca.jpg → 0.0933 sec 
- IMG\_3134.jpeg.jpg.rf.50750ca778773042a3c46a1d3e480132.jpg → 0.0878 sec 
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- IMG\_3154.jpeg.jpg.rf.5f429a366c02d38bc9e2217f4508c3e0.jpg → 0.0878 sec 
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- IMG\_3173.jpeg.jpg.rf.6f05acaa0b22d410a5df3ea3286e227d.jpg → 0.0881 sec 
- IMG\_3175.jpeg.jpg.rf.686c7d36e049eea974a363e99bf0bee0.jpg → 0.0904 sec 
- IMG\_8331.jpg.rf.ec024bdf1e9de02b020b5e6505c1c58b.jpg → 0.1037 sec 
- IMG\_8343.jpg.rf.2d88000497d74d72aedc118b125a0c07.jpg → 0.0962 sec 
- IMG\_8395.jpg.rf.3bebece033961c9f665571644a14261f.jpg → 0.1089 sec 
- IMG\_8396.jpg.rf.106a6ced5c649ea81f0de8ecaa4ff3b8.jpg → 0.1163 sec 
- IMG\_8404.jpg.rf.265b89e862a375f6b89f781ea60ed480.jpg → 0.1065 sec 
- IMG\_8420.jpg.rf.31f1d5f1440e48ccf1dee988b565911b.jpg → 0.0851 sec 
- IMG\_8452.jpg.rf.6bbff701ab93e29553b3a70137fd4e66.jpg → 0.1073 sec 
- IMG\_8490.jpg.rf.1836542cf054c6d303a2dd05d4194d7f.jpg → 0.1147 sec 
- IMG\_8497\_MOV-0.jpg.rf.5c59bd1bf7d8fd7a20999d51a79a12c0.jpg → 0.0928 sec 
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- IMG\_8497\_MOV-5.jpg.rf.3deffb208d656b7845661c5e33dd1afb.jpg → 0.0723 sec 
- IMG\_8513\_MOV-0.jpg.rf.2a2f77e3f73630b60aab6ad3ca4ed130.jpg → 0.0835 sec 
- IMG\_8515.jpg.rf.98a9daca7c5a5bad9872bd7fb2d4f198.jpg → 0.0953 sec 
- IMG\_8582\_MOV-0.jpg.rf.aa8304d7a5112d63c8841d96160d42cd.jpg → 0.0882 sec 
- IMG\_8582\_MOV-3.jpg.rf.c7dde0639837077f76428d70223368a4.jpg → 0.0977 sec 
- IMG\_8582\_MOV-5.jpg.rf.9d7a26fbf145ce39ab0831b4e6bc1f1e.jpg → 0.0891 sec 
- IMG\_8590\_MOV-2.jpg.rf.2136fdb5dcbcd58a1dc456bb3e5bf476.jpg → 0.0817 sec 
- IMG\_8590\_MOV-5.jpg.rf.074e6d8acdd3fcad16d866c341b43769.jpg → 0.0864 sec 
- IMG\_8595\_MOV-0.jpg.rf.312ab0b8b9fca18134aee88044f45a06.jpg → 0.0883 sec 

IMG\_8599\_MOV-3.jpg.rf.412ebb16ea80e964b4464c50e757df0e.jpg → 0.0865 sec 

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Total Images: 63 

Total Inference Time: 6.2129 sec 

Average Inference Time per Image: 0.0986 sec 

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