```python
import os
HOME = os.getcwd()
print(HOME)
```

/content

!nvidia-smi

```
Wed Apr 24 22:08:55 2024
+-----------------------------------------------------------------------------------------+
| NVIDIA-SMI 535.104.05              Driver Version: 535.104.05    CUDA Version: 12.2      |
|-----------------------------------------+----------------------+----------------------+
| GPU  Name                 Persistence-M | Bus-Id          Disp.A | Volatile Uncorr. ECC |
| Fan  Temp   Perf          Pwr:Usage/Cap |          Memory-Usage | GPU-Util  Compute M. |
|                                         |                      |               MIG M. |
|=========================================+======================+======================|
|   0  Tesla T4                       Off | 00000000:00:04.0 Off |                    0 |
| N/A   48C    P8              10W /  70W |        0MiB / 15360MiB |      0%      Default |
|                                         |                      |                  N/A |
+-----------------------------------------+----------------------+----------------------+

+-----------------------------------------------------------------------------------------+
| Processes:                                                                              |
|  GPU   GI   CI        PID   Type   Process name                            GPU Memory |
|        ID   ID                                                             Usage      |
|=========================================================================================|
|  No running processes found                                                             |
+-----------------------------------------------------------------------------------------+
```

```python
!pip install ultralytics==8.0.196

from IPython import display
display.clear_output()

import ultralytics
ultralytics.checks()
```

```
Ultralytics YOLOv8.0.196 🚀 Python-3.10.12 torch-2.2.1+cu121 CUDA:0
(Tesla T4, 15102MiB)
Setup complete ✅ (2 CPUs, 12.7 GB RAM, 29.0/78.2 GB disk)
```

```python
from ultralytics import YOLO

from IPython.display import display, Image

#custom data to train for YOLO model
!mkdir {HOME}/datasets
%cd {HOME}/datasets
!pip install roboflow


from roboflow import Roboflow
rf = Roboflow(api_key="ADD_ROBOFLOW_KEY")
project = rf.workspace("yolov5-zexzl").project("flood-person-
detection-fxn2y")
version = project.version(2)
dataset = version.download("yolov8")
```

```
/content/datasets
Collecting roboflow
  Downloading roboflow-1.1.27-py3-none-any.whl (74 kB)
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 74.1/74.1 kB 1.3 MB/s eta
0:00:00
 roboflow)
  Downloading certifi-2023.7.22-py3-none-any.whl (158 kB)
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 158.3/158.3 kB 3.6 MB/s eta
0:00:00
 roboflow)
  Downloading chardet-4.0.0-py2.py3-none-any.whl (178 kB)
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 178.7/178.7 kB 13.2 MB/s eta
0:00:00
 roboflow)
  Downloading cycler-0.10.0-py2.py3-none-any.whl (6.5 kB)
Collecting idna==2.10 (from roboflow)
  Downloading idna-2.10-py2.py3-none-any.whl (58 kB)
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 58.8/58.8 kB 8.4 MB/s eta
0:00:00
```

```
ent already satisfied: kiwisolver>=1.3.1 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (1.4.5)
Requirement already satisfied: matplotlib in
/usr/local/lib/python3.10/dist-packages (from roboflow) (3.7.1)
Requirement already satisfied: numpy>=1.18.5 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (1.25.2)
Collecting opencv-python-headless==4.8.0.74 (from roboflow)
  Downloading opencv_python_headless-4.8.0.74-cp37-abi3-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl (49.1 MB)
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 49.1/49.1 MB 13.5 MB/s eta
0:00:00
ent already satisfied: Pillow>=7.1.2 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (9.4.0)
Requirement already satisfied: python-dateutil in
/usr/local/lib/python3.10/dist-packages (from roboflow) (2.8.2)
Collecting python-dotenv (from roboflow)
  Downloading python_dotenv-1.0.1-py3-none-any.whl (19 kB)
Requirement already satisfied: requests in
/usr/local/lib/python3.10/dist-packages (from roboflow) (2.31.0)
Requirement already satisfied: six in /usr/local/lib/python3.10/dist-
packages (from roboflow) (1.16.0)
Requirement already satisfied: urllib3>=1.26.6 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (2.0.7)
Requirement already satisfied: tqdm>=4.41.0 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (4.66.2)
Requirement already satisfied: PyYAML>=5.3.1 in
/usr/local/lib/python3.10/dist-packages (from roboflow) (6.0.1)
Collecting requests-toolbelt (from roboflow)
  Downloading requests_toolbelt-1.0.0-py2.py3-none-any.whl (54 kB)
━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 54.5/54.5 kB 8.7 MB/s eta
0:00:00
agic (from roboflow)
  Downloading python_magic-0.4.27-py2.py3-none-any.whl (13 kB)
Requirement already satisfied: contourpy>=1.0.1 in
/usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow)
(1.2.1)
Requirement already satisfied: fonttools>=4.22.0 in
/usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow)
(4.51.0)
Requirement already satisfied: packaging>=20.0 in
/usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow)
(24.0)
Requirement already satisfied: pyparsing>=2.3.1 in
/usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow)
(3.1.2)
Requirement already satisfied: charset-normalizer<4,>=2 in
/usr/local/lib/python3.10/dist-packages (from requests->roboflow)
(3.3.2)
Installing collected packages: python-magic, python-dotenv, opencv-
```

```
python-headless, idna, cycler, chardet, certifi, requests-toolbelt,
roboflow
  Attempting uninstall: opencv-python-headless
    Found existing installation: opencv-python-headless 4.9.0.80
    Uninstalling opencv-python-headless-4.9.0.80:
      Successfully uninstalled opencv-python-headless-4.9.0.80
  Attempting uninstall: idna
    Found existing installation: idna 3.7
    Uninstalling idna-3.7:
      Successfully uninstalled idna-3.7
  Attempting uninstall: cycler
    Found existing installation: cycler 0.12.1
    Uninstalling cycler-0.12.1:
      Successfully uninstalled cycler-0.12.1
  Attempting uninstall: chardet
    Found existing installation: chardet 5.2.0
    Uninstalling chardet-5.2.0:
      Successfully uninstalled chardet-5.2.0
  Attempting uninstall: certifi
    Found existing installation: certifi 2024.2.2
    Uninstalling certifi-2024.2.2:
      Successfully uninstalled certifi-2024.2.2
Successfully installed certifi-2023.7.22 chardet-4.0.0 cycler-0.10.0
idna-2.10 opencv-python-headless-4.8.0.74 python-dotenv-1.0.1 python-
magic-0.4.27 requests-toolbelt-1.0.0 roboflow-1.1.27
```

```
{"id":"3096faf7f8e14d258dc8dd9d22efc31d","pip_warning":{"packages":
["certifi","chardet","cv2","cycler","idna"]}}
```

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

Downloading Dataset Version Zip in Flood-person-detection-2 to
yolov8:: 100%|███████████| 50470/50470 [00:00<00:00, 56509.38it/s]




Extracting Dataset Version Zip to Flood-person-detection-2 in yolov8::
100%|███████████| 1612/1612 [00:00<00:00, 4400.77it/s]

%cd {HOME}
!yolo task=detect mode=train model=yolov8s.pt
data={dataset.location}/data.yaml epochs=10 imgsz=640 plots=True

/content
Downloading
https://github.com/ultralytics/assets/releases/download/v0.0.0/yolov8s
.pt to 'yolov8s.pt'...
100% 21.5M/21.5M [00:00<00:00, 163MB/s]
New https://pypi.org/project/ultralytics/8.2.2 available 😊 Update
```

```
with 'pip install -U ultralytics'
Ultralytics YOLOv8.0.196 🚀 Python-3.10.12 torch-2.2.1+cu121 CUDA:0
(Tesla T4, 15102MiB)
engine/trainer: task=detect, mode=train, model=yolov8s.pt,
data=/content/datasets/Flood-person-detection-2/data.yaml, epochs=10,
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, 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, 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, dfl=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/train
Downloading https://ultralytics.com/assets/Arial.ttf to
'/root/.config/Ultralytics/Arial.ttf'...
100% 755k/755k [00:00<00:00, 16.9MB/s]
2024-04-24 22:13:00.856005: E
external/local_xla/xla/stream_executor/cuda/cuda_dnn.cc:9261] Unable
to register cuDNN factory: Attempting to register factory for plugin
cuDNN when one has already been registered
2024-04-24 22:13:00.856059: E
external/local_xla/xla/stream_executor/cuda/cuda_fft.cc:607] Unable to
register cuFFT factory: Attempting to register factory for plugin
cuFFT when one has already been registered
2024-04-24 22:13:00.857470: E
external/local_xla/xla/stream_executor/cuda/cuda_blas.cc:1515] Unable
to register cuBLAS factory: Attempting to register factory for plugin
cuBLAS when one has already been registered
Overriding model.yaml nc=80 with nc=2

                     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    2116822
ultralytics.nn.modules.head.Detect               [2, [128, 256, 512]]
```

```
Model summary: 225 layers, 11136374 parameters, 11136358 gradients,
28.6 GFLOPs

Transferred 349/355 items from pretrained weights
TensorBoard: Start with 'tensorboard --logdir runs/detect/train', view
at http://localhost:6006/
Freezing layer 'model.22.dfl.conv.weight'
AMP: running Automatic Mixed Precision (AMP) checks with YOLOv8n...
Downloading
https://github.com/ultralytics/assets/releases/download/v0.0.0/yolov8n
.pt to 'yolov8n.pt'...
100% 6.23M/6.23M [00:00<00:00, 81.1MB/s]
WARNING ⚠ NMS time limit 0.550s exceeded
AMP: checks passed ⬜
train: Scanning
/content/datasets/Flood-person-detection-2/train/labels... 563 images,
16 backgrounds, 0 corrupt: 100% 563/563 [00:00<00:00, 1626.41it/s]
train: WARNING ⚠
/content/datasets/Flood-person-detection-2/train/images/images353_jpg.
rf.35741260218f59886755579750107580a.jpg: 1 duplicate labels removed
train: New cache created:
/content/datasets/Flood-person-detection-2/train/labels.cache
albumentations: Blur(p=0.01, blur_limit=(3, 7)), MedianBlur(p=0.01,
blur_limit=(3, 7)), ToGray(p=0.01), CLAHE(p=0.01, clip_limit=(1, 4.0),
tile_grid_size=(8, 8))
/usr/lib/python3.10/multiprocessing/popen_fork.py:66: RuntimeWarning:
os.fork() was called. os.fork() is incompatible with multithreaded
code, and JAX is multithreaded, so this will likely lead to a
deadlock.
  self.pid = os.fork()
val: Scanning
/content/datasets/Flood-person-detection-2/valid/labels... 161 images,
0 backgrounds, 0 corrupt: 100% 161/161 [00:00<00:00, 594.88it/s]
val: WARNING ⚠
/content/datasets/Flood-person-detection-2/valid/images/Y3EDN3L4FZOY3J
DTE3T42WIKOY_jpg.rf.ccb55c1f0c816b0220d2c05cbc93bf90.jpg: 1 duplicate
labels removed
val: New cache created:
/content/datasets/Flood-person-detection-2/valid/labels.cache
Plotting labels to runs/detect/train/labels.jpg...
optimizer: 'optimizer=auto' found, ignoring 'lr0=0.01' and
'momentum=0.937' and determining best 'optimizer', 'lr0' and
'momentum' automatically...
optimizer: AdamW(lr=0.001667, momentum=0.9) with parameter groups 57
weight(decay=0.0), 64 weight(decay=0.0005), 63 bias(decay=0.0)
Image sizes 640 train, 640 val
Using 2 dataloader workers
Logging results to runs/detect/train
Starting training for 10 epochs...
```

```
Closing dataloader mosaic
albumentations: Blur(p=0.01, blur_limit=(3, 7)), MedianBlur(p=0.01,
blur_limit=(3, 7)), ToGray(p=0.01), CLAHE(p=0.01, clip_limit=(1, 4.0),
tile_grid_size=(8, 8))
/usr/lib/python3.10/multiprocessing/popen_fork.py:66: RuntimeWarning:
os.fork() was called. os.fork() is incompatible with multithreaded
code, and JAX is multithreaded, so this will likely lead to a
deadlock.
  self.pid = os.fork()

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss   Instances
Size
       1/10       4.1G       1.34      2.709      1.397          10
640: 100% 36/36 [00:17<00:00,  2.08it/s]
                Class     Images  Instances      Box(P          R
mAP50   mAP50-95): 100% 6/6 [00:03<00:00,  1.81it/s]
                  all        161        609      0.446      0.396
0.368       0.19

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss   Instances
Size
       2/10       4.3G      1.496      1.982      1.514           4
640: 100% 36/36 [00:12<00:00,  2.90it/s]
                Class     Images  Instances      Box(P          R
mAP50   mAP50-95): 100% 6/6 [00:02<00:00,  2.71it/s]
                  all        161        609      0.131      0.215
0.0876     0.0352

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss   Instances
Size
       3/10       4.3G      1.614      2.001      1.627          15
640: 100% 36/36 [00:12<00:00,  2.99it/s]
                Class     Images  Instances      Box(P          R
mAP50   mAP50-95): 100% 6/6 [00:03<00:00,  1.95it/s]
                  all        161        609      0.201      0.284
0.15      0.0613

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss   Instances
Size
       4/10      4.18G      1.619      1.964      1.618           7
640: 100% 36/36 [00:11<00:00,  3.05it/s]
                Class     Images  Instances      Box(P          R
mAP50   mAP50-95): 100% 6/6 [00:02<00:00,  2.43it/s]
                  all        161        609      0.207      0.459
0.162     0.0655

      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss   Instances
Size
       5/10      4.17G      1.561      1.952      1.624           9
640: 100% 36/36 [00:12<00:00,  2.97it/s]
```

```
                   Class     Images  Instances       Box(P          R
mAP50  mAP50-95): 100% 6/6 [00:02<00:00,  2.61it/s]
                     all        161        609        0.42      0.317
0.306       0.131

     Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances
Size
      6/10      4.19G       1.561       1.987        1.59          2
640: 100% 36/36 [00:12<00:00,  2.94it/s]
                   Class     Images  Instances       Box(P          R
mAP50  mAP50-95): 100% 6/6 [00:02<00:00,  2.78it/s]
                     all        161        609       0.453      0.388
0.368       0.167

     Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances
Size
      7/10      4.19G       1.455       1.761       1.539          9
640: 100% 36/36 [00:13<00:00,  2.68it/s]
                   Class     Images  Instances       Box(P          R
mAP50  mAP50-95): 100% 6/6 [00:02<00:00,  2.74it/s]
                     all        161        609       0.524      0.404
0.445       0.211

     Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances
Size
      8/10      4.18G       1.389       1.621       1.484         16
640: 100% 36/36 [00:11<00:00,  3.02it/s]
                   Class     Images  Instances       Box(P          R
mAP50  mAP50-95): 100% 6/6 [00:03<00:00,  1.81it/s]
                     all        161        609        0.62       0.43
0.481       0.257

     Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances
Size
      9/10      4.18G       1.271       1.495       1.413         11
640: 100% 36/36 [00:12<00:00,  2.84it/s]
                   Class     Images  Instances       Box(P          R
mAP50  mAP50-95): 100% 6/6 [00:02<00:00,  2.83it/s]
                     all        161        609       0.599      0.544
0.534       0.302

     Epoch    GPU_mem    box_loss    cls_loss    dfl_loss  Instances
Size
     10/10      4.19G       1.233       1.467       1.396          2
640: 100% 36/36 [00:12<00:00,  2.95it/s]
                   Class     Images  Instances       Box(P          R
mAP50  mAP50-95): 100% 6/6 [00:02<00:00,  2.60it/s]
                     all        161        609       0.603      0.562
0.559       0.334
```

```
10 epochs completed in 0.047 hours.
Optimizer stripped from runs/detect/train/weights/last.pt, 22.5MB
Optimizer stripped from runs/detect/train/weights/best.pt, 22.5MB

Validating runs/detect/train/weights/best.pt...
Ultralytics YOLOv8.0.196 🚀 Python-3.10.12 torch-2.2.1+cu121 CUDA:0
(Tesla T4, 15102MiB)
Model summary (fused): 168 layers, 11126358 parameters, 0 gradients,
28.4 GFLOPs
                 Class     Images  Instances      Box(P          R
mAP50   mAP50-95): 100% 6/6 [00:07<00:00,   1.20s/it]
                   all        161        609      0.603      0.565
0.559       0.333
                animal        161        206      0.504      0.553
0.483       0.291
                person        161        403      0.701      0.576
0.634       0.376
Speed: 0.3ms preprocess, 4.8ms inference, 0.0ms loss, 7.2ms
postprocess per image
Results saved to runs/detect/train
💡 Learn more at https://docs.ultralytics.com/modes/train

!ls {HOME}/runs/detect/train/

args.yaml                          PR_curve.png
val_batch0_pred.jpg
confusion_matrix_normalized.png            R_curve.png
val_batch1_labels.jpg
confusion_matrix.png                    results.csv
val_batch1_pred.jpg
events.out.tfevents.1713996783.cbb0b4b48a09.1955.0   results.png
         val_batch2_labels.jpg
F1_curve.png                            train_batch0.jpg
val_batch2_pred.jpg
labels_correlogram.jpg                      train_batch1.jpg
weights
labels.jpg                       train_batch2.jpg
P_curve.png                          val_batch0_labels.jpg

%cd {HOME}
Image(filename=f'{HOME}/runs/detect/train/confusion_matrix.png',
width=600)

/content
```
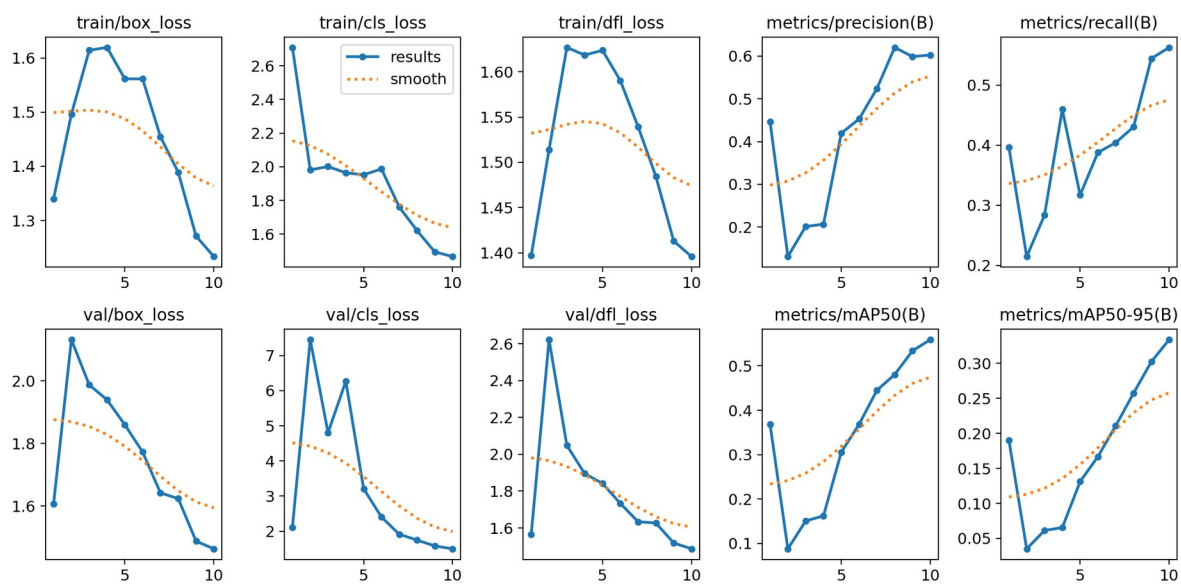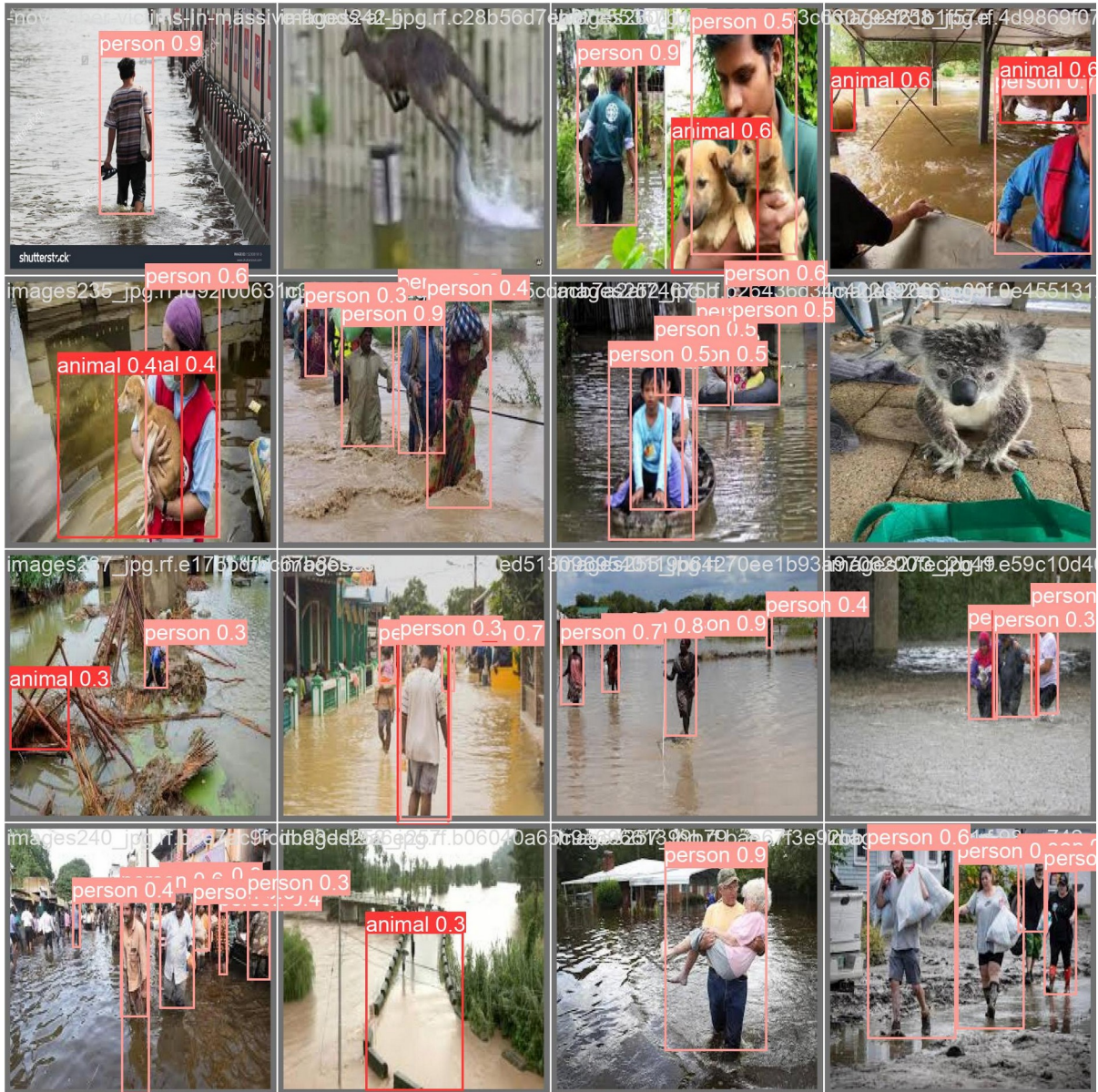
Confusion Matrix

	animal	person	background
animal	121	16	118
person	3	248	110
background	82	139	

Predicted / True
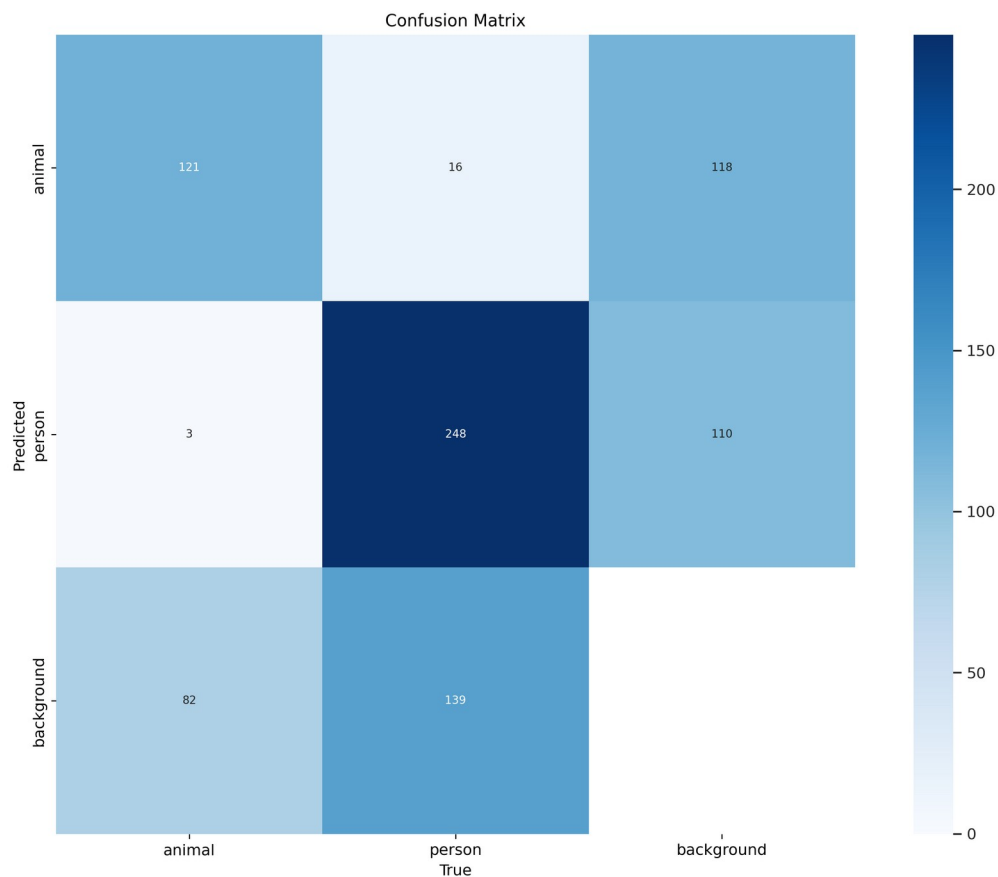
```
%cd {HOME}
Image(filename=f'{HOME}/runs/detect/train/results.png', width=600)

/content
```

train/box_loss
train/cls_loss
train/dfl_loss
metrics/precision(B)
metrics/recall(B)

legend: results, smooth

val/box_loss
val/cls_loss
val/dfl_loss
metrics/mAP50(B)
metrics/mAP50-95(B)

```
%cd {HOME}
Image(filename=f'{HOME}/runs/detect/train/val_batch0_pred.jpg',
width=600)

/content
```


Validate Model

```
%cd {HOME}
!yolo task=detect mode=val
model={HOME}/runs/detect/train/weights/best.pt
data={dataset.location}/data.yaml
```

```
/content
Ultralytics YOLOv8.0.196 🚀 Python-3.10.12 torch-2.2.1+cu121 CUDA:0
(Tesla T4, 15102MiB)
Model summary (fused): 168 layers, 11126358 parameters, 0 gradients,
28.4 GFLOPs
val: Scanning
/content/datasets/Flood-person-detection-2/valid/labels.cache... 161
images, 0 backgrounds, 0 corrupt: 100% 161/161 [00:00<?, ?it/s]
val: WARNING ⚠
/content/datasets/Flood-person-detection-2/valid/images/Y3EDN3L4FZOY3J
DTE3T42WIKOY_jpg.rf.ccb55c1f0c816b0220d2c05cbc93bf90.jpg: 1 duplicate
labels removed
/usr/lib/python3.10/multiprocessing/popen_fork.py:66: RuntimeWarning:
os.fork() was called. os.fork() is incompatible with multithreaded
code, and JAX is multithreaded, so this will likely lead to a
deadlock.
  self.pid = os.fork()
                Class     Images  Instances      Box(P          R
mAP50   mAP50-95): 100% 11/11 [00:06<00:00,  1.72it/s]
                  all        161        609      0.603      0.565
0.559       0.334
               animal        161        206      0.502      0.553
0.483       0.291
               person        161        403      0.704      0.577
0.634       0.377
Speed: 1.0ms preprocess, 11.7ms inference, 0.0ms loss, 6.0ms
postprocess per image
Results saved to runs/detect/val
💡 Learn more at https://docs.ultralytics.com/modes/val
```

Inference with custom Model

```
%cd {HOME}
!yolo task=detect mode=predict
model={HOME}/runs/detect/train/weights/best.pt conf=0.25
source={dataset.location}/test/images save=True

/content
Ultralytics YOLOv8.0.196 🚀 Python-3.10.12 torch-2.2.1+cu121 CUDA:0
(Tesla T4, 15102MiB)
Model summary (fused): 168 layers, 11126358 parameters, 0 gradients,
28.4 GFLOPs

image 1/76
/content/datasets/Flood-person-detection-2/test/images/101633684_jpg.r
f.ce475dafe4c51b18677e03a8a47fc7af.jpg: 640x640 1 animal, 16.4ms
image 2/76
/content/datasets/Flood-person-detection-2/test/images/2022-09-
06T214109Z_1709372252_RC2TBW9T5RZ6_RTRMADP_3_PAKISTAN-WEATHER-FLOODS-
```

scaled_jpg.rf.642aae0b58e7d2c0205bc88ea90b97cf.jpg: 640x640 5 persons, 16.4ms
image 3/76 /content/datasets/Flood-person-detection-2/test/images/220622002719-01-bangladesh-flooding-062122_jpg.rf.62bdf4f1e1b8455b2262d92c3ad3b4ee.jpg: 640x640 2 persons, 16.3ms
image 4/76 /content/datasets/Flood-person-detection-2/test/images/227340_jpg.rf.49de3628a6a5200a17ffd4197096068d.jpg: 640x640 19 persons, 16.3ms
image 5/76 /content/datasets/Flood-person-detection-2/test/images/230710-Himachal-Pradesh-India-river-beas-flooding-ac-1045p-66fc44_jpg.rf.fc33ae25fea4c99133ac381a8b6acc79.jpg: 640x640 (no detections), 16.3ms
image 6/76 /content/datasets/Flood-person-detection-2/test/images/230710-Pushkar-India-camel-street-flood-ac-1046p-66e6c1_jpg.rf.5638eaac7a9f4f5d12da5ded3d797000.jpg: 640x640 2 animals, 2 persons, 16.3ms
image 7/76 /content/datasets/Flood-person-detection-2/test/images/2472662_jpg.rf.e274e97d4343235810dac7894af3db24.jpg: 640x640 8 animals, 3 persons, 16.3ms
image 8/76 /content/datasets/Flood-person-detection-2/test/images/3927926-1422319131_jpeg.rf.0c228bb85597cbbcd6e82f291e4592b5.jpg: 640x640 20 persons, 14.5ms
image 9/76 /content/datasets/Flood-person-detection-2/test/images/59565179_jpg.rf.4e635e5c269d4a4f05aab8b9c2746790.jpg: 640x640 9 animals, 14.5ms
image 10/76 /content/datasets/Flood-person-detection-2/test/images/62880478_902_jpg.rf.5a3ef3a9fcb18ccfb29720b440889aae.jpg: 640x640 7 persons, 14.4ms
image 11/76 /content/datasets/Flood-person-detection-2/test/images/84580861_jpg.rf.7ddb4b1af2caa2b99bb640f936a8108b.jpg: 640x640 1 person, 14.5ms
image 12/76 /content/datasets/Flood-person-detection-2/test/images/97881-gohonvpcnh-1583915303_jpg.rf.50187ab60c003a874c1561b27320339b.jpg: 640x640 11 persons, 14.4ms
image 13/76 /content/datasets/Flood-person-detection-2/test/images/How-to-help-flood-affected-wildlife2_png.rf.02ca7fba4d83ca820a3647128471dbf5.jpg: 640x640 1 animal, 14.4ms
image 14/76 /content/datasets/Flood-person-detection-2/test/images/SeamusDog_1674119202720_hpMain_16x9_1600_jpg.rf.1caa9f55ad7ae460061b5dbbc53562db.jpg: 640x640 (no detections), 13.3ms

```
image 15/76
/content/datasets/Flood-person-detection-2/test/images/Several-
volunteers-have-joined-hands-with-NGOs-to-
_1689706800799_jpg.rf.4dad01e8a398d3be1f19bd68eedc74e2.jpg: 640x640 7
animals, 3 persons, 13.2ms
image 16/76
/content/datasets/Flood-person-detection-2/test/images/abandoned-dogs-
storm-harvey-texas-fb4__700-
png_jpg.rf.238ecd3e715ec480866ab961b6f18916.jpg: 640x640 1 animal, 2
persons, 13.2ms
image 17/76
/content/datasets/Flood-person-detection-2/test/images/animal-
rescuers-savings-dogs-
flood_jpg.rf.6fc1982389170f9c4fbf79efdcd8a7f2.jpg: 640x640 3 animals,
2 persons, 13.3ms
image 18/76
/content/datasets/Flood-person-detection-2/test/images/bfdd38d9-c022-
4102-99e1-d7f2e8d61fb7-Florence-AN-091618-
015_jpg.rf.b50de29b75c7cbde70a886e478d72913.jpg: 640x640 1 animal, 5
persons, 13.2ms
image 19/76
/content/datasets/Flood-person-detection-2/test/images/clip_74_jpg.rf.
908c7e43fcb5be2321bfc6e7f798d052.jpg: 640x640 1 animal, 13.2ms
image 20/76
/content/datasets/Flood-person-detection-2/test/images/dog-flood-
preparedness-7_jpg.rf.ba6e810dd5d955dadbfb9b4cea00a4b4.jpg: 640x640 1
animal, 1 person, 12.9ms
image 21/76
/content/datasets/Flood-person-detection-2/test/images/dog-in-
water_png.rf.ef041bc59d77f934c4254bc2f11605c4.jpg: 640x640 2 animals,
12.4ms
image 22/76
/content/datasets/Flood-person-detection-2/test/images/download_jpg.rf
.5dc5871316e75a9e999792d4dd1cfc1d.jpg: 640x640 6 animals, 12.6ms
image 23/76
/content/datasets/Flood-person-detection-2/test/images/foodb-
1661693646621_182e4a8d72c_medium_jpg.rf.fe25dd1d7289e31ab6efb3e991ec7e
98.jpg: 640x640 2 persons, 12.3ms
image 24/76
/content/datasets/Flood-person-detection-2/test/images/image14_jpeg.rf
.ce4b6be2b9d57010a1b3ed83ced2f692.jpg: 640x640 1 animal, 2 persons,
12.3ms
image 25/76
/content/datasets/Flood-person-detection-2/test/images/image16_jpeg.rf
.0524c8cc4c2cfba43ffb852e0503da8f.jpg: 640x640 1 animal, 12.3ms
image 26/76
/content/datasets/Flood-person-detection-2/test/images/image17_jpeg.rf
.b56ff7487ad01976e9b81b2a9fd046e4.jpg: 640x640 1 person, 12.3ms
image 27/76
```

```
/content/datasets/Flood-person-detection-2/test/images/image27_jpeg.rf
.b91ae29bec8aceb7dd364d378814e03c.jpg: 640x640 7 persons, 12.4ms
image 28/76
/content/datasets/Flood-person-detection-2/test/images/images-32-
_jpg.rf.cf360d74adb50908c36c95194fd12969.jpg: 640x640 2 persons,
12.3ms
image 29/76
/content/datasets/Flood-person-detection-2/test/images/images-35-
_jpg.rf.5d6d7e4ee40d7e7f3acb2bbf7c9af83f.jpg: 640x640 3 persons,
12.3ms
image 30/76
/content/datasets/Flood-person-detection-2/test/images/images-46-
_jpg.rf.1d705b30a2486eb97a6a138c7e144335.jpg: 640x640 1 person, 12.3ms
image 31/76
/content/datasets/Flood-person-detection-2/test/images/images125_jpg.r
f.2deb2d98538869e889ca24d2c3e04180.jpg: 640x640 2 animals, 12.3ms
image 32/76
/content/datasets/Flood-person-detection-2/test/images/images127_jpg.r
f.66a2804fa87c153f6022fd11d0bc37f9.jpg: 640x640 1 person, 12.4ms
image 33/76
/content/datasets/Flood-person-detection-2/test/images/images13_jpg.rf
.cd2f9edaff841b061fe9a8e75af40486.jpg: 640x640 1 animal, 5 persons,
12.3ms
image 34/76
/content/datasets/Flood-person-detection-2/test/images/images153_jpg.r
f.2c32baed51149592e309c0c155d147d4.jpg: 640x640 1 person, 12.3ms
image 35/76
/content/datasets/Flood-person-detection-2/test/images/images15_jpg.rf
.90e78924baf215d58a934f91f8490e50.jpg: 640x640 2 animals, 1 person,
12.3ms
image 36/76
/content/datasets/Flood-person-detection-2/test/images/images165_jpg.r
f.0781554ed9b5e96f650895a2db368aae.jpg: 640x640 2 animals, 3 persons,
12.3ms
image 37/76
/content/datasets/Flood-person-detection-2/test/images/images167_jpg.r
f.a1ab3ed9ee0fe3721e5f29f664737c79.jpg: 640x640 2 persons, 12.3ms
image 38/76
/content/datasets/Flood-person-detection-2/test/images/images171_jpg.r
f.f2fcf15b0b9e363bc18b6ce61605b0d5.jpg: 640x640 1 animal, 4 persons,
12.3ms
image 39/76
/content/datasets/Flood-person-detection-2/test/images/images178_jpg.r
f.a8be28e731b8fe6e1118bedf8397847f.jpg: 640x640 3 animals, 12.3ms
image 40/76
/content/datasets/Flood-person-detection-2/test/images/images184_jpg.r
f.4eee6e21457ab3eb24b42ce726a04aa3.jpg: 640x640 3 animals, 4 persons,
12.3ms
image 41/76
```

```
/content/datasets/Flood-person-detection-2/test/images/images187_jpg.r
f.e8e90f0a539eb50370fe31cfed67baa3.jpg: 640x640 (no detections),
12.3ms
image 42/76
/content/datasets/Flood-person-detection-2/test/images/images189_jpg.r
f.009a7162c943b89039ee47404e73d67f.jpg: 640x640 1 animal, 1 person,
12.3ms
image 43/76
/content/datasets/Flood-person-detection-2/test/images/images18_jpg.rf
.ee9fc7aa062bb5cef4917bae724566a2.jpg: 640x640 1 person, 12.3ms
image 44/76
/content/datasets/Flood-person-detection-2/test/images/images195_jpg.r
f.df915d804754b49b53198afbac6dbd2e.jpg: 640x640 2 persons, 12.7ms
image 45/76
/content/datasets/Flood-person-detection-2/test/images/images206_jpg.r
f.0a2026cf640e7c09ff7f5ed04ca2639a.jpg: 640x640 3 animals, 12.3ms
image 46/76
/content/datasets/Flood-person-detection-2/test/images/images215_jpg.r
f.d7b252b8454c02b87262337b1d6a35be.jpg: 640x640 8 persons, 12.3ms
image 47/76
/content/datasets/Flood-person-detection-2/test/images/images219_jpg.r
f.c1f3309d29213f004aff29feca7f2426.jpg: 640x640 4 persons, 12.3ms
image 48/76
/content/datasets/Flood-person-detection-2/test/images/images228_jpg.r
f.d1ba9cdc1b0d448ff9657be387378cf7.jpg: 640x640 1 person, 12.3ms
image 49/76
/content/datasets/Flood-person-detection-2/test/images/images232_jpg.r
f.8c11a5d106215eb877e2d771dd96b72c.jpg: 640x640 2 animals, 2 persons,
12.3ms
image 50/76
/content/datasets/Flood-person-detection-2/test/images/images233_jpg.r
f.15da8c94e876d672ba2a2e27ed042947.jpg: 640x640 1 person, 12.3ms
image 51/76
/content/datasets/Flood-person-detection-2/test/images/images236_jpg.r
f.67e7f90970eb03783e70b7760a9eff77.jpg: 640x640 6 animals, 12.3ms
image 52/76
/content/datasets/Flood-person-detection-2/test/images/images240_jpg.r
f.099ea95e70dbc80b6e4f5a26734d1710.jpg: 640x640 2 animals, 12.3ms
image 53/76
/content/datasets/Flood-person-detection-2/test/images/images256_jpg.r
f.29e4b54416612028140faeaadc3991dc.jpg: 640x640 2 persons, 12.3ms
image 54/76
/content/datasets/Flood-person-detection-2/test/images/images25_jpg.rf
.e0649b55552c65280dfd4ed371fc225b.jpg: 640x640 9 persons, 12.3ms
image 55/76
/content/datasets/Flood-person-detection-2/test/images/images263_jpg.r
f.27ce53e65f4c3e9ab6f7e7af0a9c4ac7.jpg: 640x640 2 animals, 12.3ms
image 56/76
/content/datasets/Flood-person-detection-2/test/images/images265_jpg.r
```

f.1ab6691b0ff95cfcf513a7c5abd2d5e0.jpg: 640x640 2 animals, 7 persons, 12.3ms
image 57/76 /content/datasets/Flood-person-detection-2/test/images/images271_jpg.rf.369af7b15bdd31d499ed362a129214a1.jpg: 640x640 2 persons, 12.3ms
image 58/76 /content/datasets/Flood-person-detection-2/test/images/images274_jpg.rf.aeeeb09bb9f3adcfc6f599a49e95c33a.jpg: 640x640 2 persons, 12.3ms
image 59/76 /content/datasets/Flood-person-detection-2/test/images/images276_jpg.rf.656138322f53efd1fd86ae98b3185064.jpg: 640x640 2 persons, 12.3ms
image 60/76 /content/datasets/Flood-person-detection-2/test/images/images302_jpg.rf.887fd8faa2c55494083dc8ee47579bcd.jpg: 640x640 3 persons, 12.3ms
image 61/76 /content/datasets/Flood-person-detection-2/test/images/images316_jpg.rf.74fbdb6ca267e92d2398a78e264a2b69.jpg: 640x640 1 person, 12.4ms
image 62/76 /content/datasets/Flood-person-detection-2/test/images/images317_jpg.rf.8029e3373b4b4ee5c32452195109b0d4.jpg: 640x640 1 animal, 12.3ms
image 63/76 /content/datasets/Flood-person-detection-2/test/images/images327_jpg.rf.3b07cf830cf71fe85191af5c59e4956c.jpg: 640x640 2 animals, 7 persons, 12.3ms
image 64/76 /content/datasets/Flood-person-detection-2/test/images/images334_jpg.rf.e543563ef80dfd822fa14a21c63c637a.jpg: 640x640 5 persons, 12.3ms
image 65/76 /content/datasets/Flood-person-detection-2/test/images/images339_jpg.rf.613ff123d3523d19dfd2e6f7191638e4.jpg: 640x640 1 animal, 6 persons, 12.3ms
image 66/76 /content/datasets/Flood-person-detection-2/test/images/images33_jpg.rf.bd7f531faa2f310b766f8ff13ea0ace6.jpg: 640x640 5 animals, 13.2ms
image 67/76 /content/datasets/Flood-person-detection-2/test/images/images345_jpg.rf.232ad5309845fed2c0bef3e9cc6a5172.jpg: 640x640 1 person, 12.9ms
image 68/76 /content/datasets/Flood-person-detection-2/test/images/images373_jpg.rf.f0391f5bfb1eff35b464af2ebb4295c8.jpg: 640x640 6 persons, 13.3ms
image 69/76 /content/datasets/Flood-person-detection-2/test/images/images380_jpg.rf.c6cd9d489a786bcacb8e099f8281cbd6.jpg: 640x640 9 persons, 13.3ms
image 70/76 /content/datasets/Flood-person-detection-2/test/images/images394_jpg.rf.9acaa0a1dac3d0c12968481bc095741a.jpg: 640x640 1 animal, 13.3ms
image 71/76 /content/datasets/Flood-person-detection-2/test/images/images93_jpg.rf.db1e61387ed583134ef0f2d7f5c29982.jpg: 640x640 (no detections), 13.3ms

```
image 72/76
/content/datasets/Flood-person-detection-2/test/images/images95_jpg.rf
.94c7a849be9c80ea05c5a1fe1b7d6d32.jpg: 640x640 1 animal, 14.0ms
image 73/76
/content/datasets/Flood-person-detection-2/test/images/images9_jpg.rf.
f7fc1a01c96f000dab97404414aa59b1.jpg: 640x640 1 animal, 13.5ms
image 74/76
/content/datasets/Flood-person-detection-2/test/images/images_jpg.rf.c
82472b32c8ed56c5406a3a03bdcb99a.jpg: 640x640 6 animals, 14.7ms
image 75/76
/content/datasets/Flood-person-detection-2/test/images/maxresdefault_j
pg.rf.0a6b559b3297ff07b1ba1a0ec53bcb96.jpg: 640x640 3 animals, 13.5ms
image 76/76
/content/datasets/Flood-person-detection-2/test/images/to8abav_kerala-
flood-dogs-rescued-
facebook_625x300_20_August_18_jpg.rf.cc3584cbce0a6a23658293858ddbbf93.
jpg: 640x640 6 animals, 1 person, 13.5ms
Speed: 1.6ms preprocess, 13.1ms inference, 8.7ms postprocess per image
at shape (1, 3, 640, 640)
Results saved to runs/detect/predict
💡 Learn more at https://docs.ultralytics.com/modes/predict
```

```python
import glob
from IPython.display import Image, display

for image_path in glob.glob(f'{HOME}/runs/detect/predict/*.jpg')[:3]:
    display(Image(filename=image_path, width=600))
    print("\n")
```
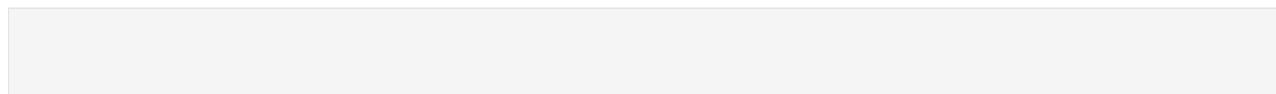
```
from google.colab import files
import shutil

shutil.make_archive("runs", 'zip', "runs")
files.download("runs.zip")
```

<IPython.core.display.Javascript object>

<IPython.core.display.Javascript object>

```
from roboflow import Roboflow
```

```python
rf = Roboflow(api_key="ADD_ROBOFLOW_KEY")
project = rf.workspace("modellabel").project("yolo-floods-relief")
version = project.version(1)
version.deploy("yolov8", f"{HOME}/runs/detect/train/weights",
"best.pt")

# project.version(dataset.version).deploy(model_type="yolov8",
model_path=f"{HOME}/runs/detect/train/")

#Run inference on your model on a persistant, auto-scaling, cloud API

#load model
model = project.version(dataset.version).model

#choose random test set image
import os, random
test_set_loc = dataset.location + "/test/images/"
random_test_image = random.choice(os.listdir(test_set_loc))
print("running inference on " + random_test_image)

pred = model.predict(test_set_loc + random_test_image, confidence=40,
overlap=30).json()
pred
```