```python
from ultralytics import YOLO

# Load a model
model = YOLO("yolo11n-obb.pt")

# Train the model
results = model.train(
    data='data.yaml',
    epochs=100,
    imgsz=640,
    device=0,
)
```

```
Ultralytics 8.3.36  Python-3.10.15 torch-2.5.1 CUDA:0 (NVIDIA GeForce
RTX 3050 Ti Laptop GPU, 4096MiB)
engine\trainer: task=obb, mode=train, model=yolo11n-obb.pt,
data=data.yaml, epochs=100, time=None, patience=100, batch=16,
imgsz=640, save=True, save_period=-1, cache=False, device=0,
workers=8, project=None, name=train2, 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,
multi_scale=False, 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,
vid_stride=1, stream_buffer=False, visualize=False, augment=False,
agnostic_nms=False, classes=None, retina_masks=False, embed=None,
show=False, save_frames=False, save_txt=False, save_conf=False,
save_crop=False, show_labels=True, show_conf=True, show_boxes=True,
line_width=None, format=torchscript, keras=False, optimize=False,
int8=False, dynamic=False, simplify=True, 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,
bgr=0.0, mosaic=1.0, mixup=0.0, copy_paste=0.0, copy_paste_mode=flip,
auto_augment=randaugment, erasing=0.4, crop_fraction=1.0, cfg=None,
tracker=botsort.yaml, save_dir=runs\obb\train2
Overriding model.yaml nc=80 with nc=4

                   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]
```

```
ultralytics.nn.modules.conv.Concat           [1]

 22                  -1  1    378880
ultralytics.nn.modules.block.C3k2            [384, 256, 1, True]

 23        [16, 19, 22]  1    503119  ultralytics.nn.modules.head.OBB
[4, 1, [64, 128, 256]]
YOLO11n-obb summary: 344 layers, 2,662,287 parameters, 2,662,271
gradients, 6.7 GFLOPs

Transferred 535/541 items from pretrained weights
TensorBoard: Start with 'tensorboard --logdir runs\obb\train2', view
at http://localhost:6006/
Freezing layer 'model.23.dfl.conv.weight'
AMP: running Automatic Mixed Precision (AMP) checks...
AMP: checks passed

train: Scanning C:\Users\aarya\Videos\New PaddleOCR\train\labels...
280 images, 0 backgrounds, 0 corrupt: 100%|██████████| 280/280
[00:00<00:00, 1365.72it/s]

train: New cache created: C:\Users\aarya\Videos\New PaddleOCR\train\
labels.cache



albumentations: Blur(p=0.01, blur_limit=(3, 7)), MedianBlur(p=0.01,
blur_limit=(3, 7)), ToGray(p=0.01, num_output_channels=3,
method='weighted_average'), CLAHE(p=0.01, clip_limit=(1.0, 4.0),
tile_grid_size=(8, 8))

val: Scanning C:\Users\aarya\Videos\New PaddleOCR\valid\labels... 80
images, 0 backgrounds, 0 corrupt: 100%|██████████| 80/80 [00:00<00:00,
931.65it/s]

val: New cache created: C:\Users\aarya\Videos\New PaddleOCR\valid\
labels.cache



Plotting labels to runs\obb\train2\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=0.00125, momentum=0.9) with parameter groups 87
weight(decay=0.0), 97 weight(decay=0.0005), 96 bias(decay=0.0)
TensorBoard: model graph visualization added
Image sizes 640 train, 640 val
Using 8 dataloader workers
Logging results to runs\obb\train2
Starting training for 100 epochs...
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances
Size

      1/100      2.74G      3.483      4.626      3.412         54
640: 100%|██████████| 18/18 [00:05<00:00,  3.30it/s]
                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95):   0%|          | 0/5 [00:00<?, ?it/s]

WARNING  NMS time limit 2.800s exceeded

                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95):  20%|██        | 1/5 [00:03<00:12,  3.22s/it]

WARNING  NMS time limit 2.800s exceeded

                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95):  40%|████      | 2/5 [00:06<00:09,  3.15s/it]

WARNING  NMS time limit 2.800s exceeded

                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95): 100%|██████████| 5/5 [00:14<00:00,  2.88s/it]

                   all         80        318    0.00992      0.247
0.0932     0.0168



      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances
Size

      2/100      2.42G       1.37       2.86      2.833         48
640: 100%|██████████| 18/18 [00:04<00:00,  4.10it/s]
                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95): 100%|██████████| 5/5 [00:06<00:00,  1.21s/it]

                   all         80        318       0.57      0.502
0.482      0.206



      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances
Size

      3/100      2.41G      1.081      1.832      2.583         57
640: 100%|██████████| 18/18 [00:04<00:00,  3.73it/s]
                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95): 100%|██████████| 5/5 [00:02<00:00,  1.79it/s]

                   all         80        318      0.646      0.906
0.99      0.537
```

```
      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances
Size

     99/100      2.39G     0.5288     0.3357      2.207         32
640: 100%|██████████| 18/18 [00:03<00:00,  5.04it/s]
                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95): 100%|██████████| 5/5 [00:00<00:00,  5.31it/s]

                   all         80        318      0.993          1
0.992      0.643



      Epoch    GPU_mem   box_loss   cls_loss   dfl_loss  Instances
Size

    100/100      2.39G      0.527     0.3355      2.249         32
640: 100%|██████████| 18/18 [00:03<00:00,  4.82it/s]
                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95): 100%|██████████| 5/5 [00:00<00:00,  5.69it/s]

                   all         80        318      0.993          1
0.992      0.644



100 epochs completed in 0.161 hours.
Optimizer stripped from runs\obb\train2\weights\last.pt, 5.9MB
Optimizer stripped from runs\obb\train2\weights\best.pt, 5.9MB

Validating runs\obb\train2\weights\best.pt...
Ultralytics 8.3.36  Python-3.10.15 torch-2.5.1 CUDA:0 (NVIDIA GeForce
RTX 3050 Ti Laptop GPU, 4096MiB)
YOLO11n-obb summary (fused): 257 layers, 2,654,503 parameters, 0
gradients, 6.6 GFLOPs

                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95): 100%|██████████| 5/5 [00:02<00:00,  2.24it/s]

                   all         80        318      0.993          1
0.991      0.691
                   EXP         79         79      0.987          1
0.987      0.706
                  GTIN         80         80      0.999          1
0.995      0.564
                   LOT         79         79      0.986          1
0.987       0.69
                 SR NO         80         80      0.999          1
0.995      0.804
```

```
Speed: 0.6ms preprocess, 3.8ms inference, 0.0ms loss, 7.6ms
postprocess per image
Results saved to runs\obb\train2
```

```python
from ultralytics import YOLO

# Load the trained model
model = YOLO("runs/obb/train/weights/best.pt")

# Validate the model
metrics = model.val()

print(f"mAP50-95: {metrics.box.map:.4f}")
print(f"mAP50: {metrics.box.map50:.4f}")
print(f"mAP75: {metrics.box.map75:.4f}")
print("mAP for each class:", metrics.box.maps)
```

```
Ultralytics 8.3.36  Python-3.10.15 torch-2.5.1 CUDA:0 (NVIDIA GeForce
RTX 3050 Ti Laptop GPU, 4096MiB)
YOLO11n-obb summary (fused): 257 layers, 2,654,503 parameters, 0
gradients, 6.6 GFLOPs

val: Scanning C:\Users\aarya\Videos\New PaddleOCR\valid\
labels.cache... 80 images, 0 backgrounds, 0 corrupt: 100%|██████████|
80/80 [00:00<?, ?it/s]
                 Class     Images  Instances      Box(P          R
mAP50  mAP50-95): 100%|██████████| 5/5 [00:03<00:00,  1.50it/s]

                   all         80        318      0.993          1
0.991      0.692
                   EXP         79         79      0.987          1
0.987      0.709
                  GTIN         80         80      0.999          1
0.995      0.564
                   LOT         79         79      0.986          1
0.987      0.691
                 SR NO         80         80      0.999          1
0.995      0.803
Speed: 1.5ms preprocess, 6.3ms inference, 0.0ms loss, 8.6ms
postprocess per image
Results saved to runs\obb\val2
mAP50-95: 0.6918
mAP50: 0.9910
mAP75: 0.8590
mAP for each class: [    0.70911     0.56359     0.69125     0.80342]
```

```python
#  Prediction using trained model

from ultralytics import YOLO

# Load a pretrained YOLOv8n model
```

```
model = YOLO('runs/obb/train/weights/best.pt')

# Run inference
model.predict("C:/Users/aarya/Videos/New PaddleOCR/test/images",
save=True, imgsz=640, conf=0.5)
```

```
image 1/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_181_OCR_0_20240612_113229_png.rf.7918be838c107d83e220d2d66
b0b7b88.jpg: 640x640 14.9ms
image 2/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_182_OCR_0_20240612_113231_png.rf.14bdaf66d022d8ea5f25a60c2
ce5b96c.jpg: 640x640 15.3ms
image 3/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_183_OCR_0_20240612_113234_png.rf.43ec9e04f848630714dad284d
5d42564.jpg: 640x640 17.0ms
image 4/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_184_OCR_0_20240612_113239_png.rf.68c995bf91fd6bc4e380cfdd2
043f216.jpg: 640x640 15.6ms
image 5/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_185_OCR_0_20240612_113241_png.rf.80bf1b1962dce708eed4d0b22
5021005.jpg: 640x640 14.1ms
image 6/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_186_OCR_0_20240612_113243_png.rf.b87ea700ff5130ad59cb770e2
5e8cf33.jpg: 640x640 11.0ms
image 7/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_187_OCR_0_20240612_113245_png.rf.983606b1d80136ecd9b5a880d
4d2d095.jpg: 640x640 15.1ms
image 8/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_188_OCR_0_20240612_113247_png.rf.e5e1b46db65d6968900f3ecfb
ca60bc0.jpg: 640x640 15.0ms
image 9/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_189_OCR_0_20240612_113249_png.rf.7d814053622c4aa357ea03150
4e90193.jpg: 640x640 15.0ms
image 10/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_190_OCR_0_20240612_113251_png.rf.0f672f98e43622b3511865f25
ad03836.jpg: 640x640 17.3ms
image 11/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_191_OCR_4_20240612_113253_png.rf.b053c00d00520ad2e85ade42d
9e03530.jpg: 640x640 21.7ms
image 12/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_192_OCR_0_20240612_113258_png.rf.fb3d57195cc56734c2ebf3f9d
6d4d301.jpg: 640x640 20.7ms
image 13/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_193_OCR_0_20240612_113301_png.rf.5a974e1e80f2df8148d38a046
f38c9cb.jpg: 640x640 8.0ms
image 14/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_194_OCR_0_20240612_113307_png.rf.e6cbf0adebdcce288c88d52a2
1c2dbdf.jpg: 640x640 12.9ms
image 15/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
```

```
OnlineImage_195_OCR_0_20240612_113310_png.rf.108d8d3de722b681b21857bfe
907d85a.jpg: 640x640 8.1ms
image 16/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_196_OCR_0_20240612_113313_png.rf.e69d7e206365283a0a8fb04ee
ff60254.jpg: 640x640 9.0ms
image 17/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_197_OCR_0_20240612_113317_png.rf.24f42c28032a75bc7fd2a30ff
7780a2b.jpg: 640x640 15.5ms
image 18/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_198_OCR_0_20240612_113320_png.rf.a1a30a53cea1b66faf7ea46bd
6d1ddbb.jpg: 640x640 15.7ms
image 19/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_199_OCR_0_20240612_113322_png.rf.a0db098d31ce75af625778a79
7eb243e.jpg: 640x640 15.0ms
image 20/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_200_OCR_0_20240612_113327_png.rf.b7f0e41f60e7ad63e4e22ed6c
265870e.jpg: 640x640 15.1ms
image 21/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_381_OCR_0_20240612_115612_png.rf.5ba603ad25247a996952ba552
c5e77d4.jpg: 640x640 15.8ms
image 22/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_382_OCR_4_20240612_115613_png.rf.0a9773fddccaba63e574d7c80
35aa99e.jpg: 640x640 8.7ms
image 23/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_383_OCR_0_20240612_115621_png.rf.15bf9e33ae4c3be47f17a5c2b
a5a77c0.jpg: 640x640 9.9ms
image 24/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_384_OCR_0_20240612_115622_png.rf.61863b5c3d87f4cf48beeeaac
03f7c56.jpg: 640x640 9.7ms
image 25/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_385_OCR_0_20240612_115624_png.rf.9d00f3ec1fe2d2e71cbcbb76f
0ff7da9.jpg: 640x640 18.0ms
image 26/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_386_OCR_0_20240612_115629_png.rf.2eb218df408dd0c63110e67f8
92fcfc6.jpg: 640x640 17.0ms
image 27/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_387_OCR_0_20240612_115630_png.rf.d8190bc56f0b0303dfce75541
9e66d6d.jpg: 640x640 9.5ms
image 28/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_388_OCR_0_20240612_115633_png.rf.b5c948c46c3ab80d805aac40b
e75cdec.jpg: 640x640 12.0ms
image 29/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_389_OCR_4_20240612_115639_png.rf.58f689f376689f25e51110e91
d627a2b.jpg: 640x640 10.0ms
image 30/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_390_OCR_0_20240612_115641_png.rf.0d6f86745cde1cf7c53f06f43
fc2128f.jpg: 640x640 17.0ms
image 31/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_391_OCR_0_20240612_115644_png.rf.6bd9d47321d0ab10320174d5a
```

```
23b6c4c.jpg: 640x640 17.4ms
image 32/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_392_OCR_0_20240612_115652_png.rf.55562c7a3cfa369a56a817bba
9c51658.jpg: 640x640 18.5ms
image 33/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_393_OCR_0_20240612_115656_png.rf.9025812bff6483fb15b28a14b
0d25d26.jpg: 640x640 16.0ms
image 34/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_394_OCR_4_20240612_115658_png.rf.aa33e9a08cf2888418c2d47e5
be3a9a4.jpg: 640x640 17.0ms
image 35/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_395_OCR_4_20240612_115701_png.rf.1518b2205e7fdc64c6d152c84
dffab00.jpg: 640x640 18.0ms
image 36/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_396_OCR_0_20240612_115708_png.rf.784c5477cbfc4ab1422371b3d
fc27e40.jpg: 640x640 16.0ms
image 37/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_397_OCR_0_20240612_115711_png.rf.7b358d03c4f8b787088cf0146
04c71d6.jpg: 640x640 17.4ms
image 38/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_398_OCR_0_20240612_115713_png.rf.1fab2d00bfd4adeb45b46d1e3
8358f07.jpg: 640x640 18.0ms
image 39/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_399_OCR_0_20240612_115718_png.rf.452d30b123f164727dac202ef
c41a52f.jpg: 640x640 19.4ms
image 40/40 C:\Users\aarya\Videos\New PaddleOCR\test\images\
OnlineImage_400_OCR_4_20240612_115721_png.rf.25aabd5803552849a883d9df0
ec86d56.jpg: 640x640 20.9ms
Speed: 2.9ms preprocess, 15.0ms inference, 6.8ms postprocess per image
at shape (1, 3, 640, 640)
Results saved to runs\obb\predict2

[ultralytics.engine.results.Results object with attributes:

 boxes: None
 keypoints: None
 masks: None
 names: {0: 'EXP', 1: 'GTIN', 2: 'LOT', 3: 'SR NO'}
 obb: ultralytics.engine.results.OBB object
 orig_img: array([[[0, 0, 0],
         [0, 0, 0],
         [0, 0, 0],
         ...,
         [0, 0, 0],
         [0, 0, 0],
         [0, 0, 0]],

        [[0, 0, 0],
         [0, 0, 0],
         [0, 0, 0],
```

```
          ...,
          [0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]],

         [[0, 0, 0],
          [0, 0, 0],
          [0, 0, 0],
          ...,
          [0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]],

         ...,

         [[0, 0, 0],
          [0, 0, 0],
          [0, 0, 0],
          ...,
          [0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]],

         [[0, 0, 0],
          [0, 0, 0],
          [0, 0, 0],
          ...,
          [0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]],

         [[0, 0, 0],
          [0, 0, 0],
          [0, 0, 0],
          ...,
          [0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]]], dtype=uint8)
 orig_shape: (640, 640)
 path: 'C:\\Users\\aarya\\Videos\\New PaddleOCR\\test\\images\\
OnlineImage_181_OCR_0_20240612_113229_png.rf.7918be838c107d83e220d2d66
b0b7b88.jpg'
 probs: None
 save_dir: 'runs\\obb\\predict2'
 speed: {'preprocess': 4.326581954956055, 'inference':
14.893293380737305, 'postprocess': 124.0549087524414},
 ultralytics.engine.results.Results object with attributes:

 boxes: None
```

```
          [0, 0, 0],
          ...,
          [0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]],

         ...,

         [[0, 0, 0],
          [0, 0, 0],
          [0, 0, 0],
          ...,
          [0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]],

         [[0, 0, 0],
          [0, 0, 0],
          [0, 0, 0],
          ...,
          [0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]],

         [[0, 0, 0],
          [0, 0, 0],
          [0, 0, 0],
          ...,
          [0, 0, 0],
          [0, 0, 0],
          [0, 0, 0]]], dtype=uint8)
 orig_shape: (640, 640)
 path: 'C:\\Users\\aarya\\Videos\\New PaddleOCR\\test\\images\\
OnlineImage_400_OCR_4_20240612_115721_png.rf.25aabd5803552849a883d9df0
ec86d56.jpg'
 probs: None
 save_dir: 'runs\\obb\\predict2'
 speed: {'preprocess': 2.9985904693603516, 'inference':
20.850181579589844, 'postprocess': 6.000757217407227}]

print(f"Model task: {model.task}")
print(f"Model names: {model.names}")

Model task: obb
Model names: {0: 'EXP', 1: 'GTIN', 2: 'LOT', 3: 'SR NO'}

image_path = "C:/Users/aarya/Videos/New
PaddleOCR/test/images/OnlineImage_181_OCR_0_20240612_113229_png.rf.791
8be838c107d83e220d2d66b0b7b88.jpg"
```

```
def visualize_predictions(image_path, model):
    image = cv2.imread(image_path)
    results = model(image)[0]
    return results.plot()
```