```
!nvidia-smi
```

```
Sun Jul 23 11:00:00 2023
+-----------------------------------------------------------------------------+
| NVIDIA-SMI 525.105.17   Driver Version: 525.105.17   CUDA Version: 12.0     |
|-------------------------------+----------------------+----------------------+
| 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   43C    P8     9W /  70W |      0MiB / 15360MiB |      0%      Default |
|                               |                      |                  N/A |
+-------------------------------+----------------------+----------------------+

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

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

```
/content
```

```
# Pip install method (recommended)

!pip install ultralytics==8.0.28

from IPython import display
display.clear_output()

import ultralytics
ultralytics.checks()
```

```
Ultralytics YOLOv8.0.28 🚀 Python-3.10.6 torch-2.0.1+cu118 CUDA:0 (Tesla T4, 15102MiB)
Setup complete ✅ (2 CPUs, 12.7 GB RAM, 24.3/78.2 GB disk)
```

```
# Git clone method (for development)

# %cd {HOME}
# !git clone github.com/ultralytics/ultralytics
# %cd {HOME}/ultralytics
# !pip install -e .

# from IPython import display
# display.clear_output()

# import ultralytics
# ultralytics.checks()


from ultralytics import YOLO

from IPython.display import display, Image


from google.colab import drive
drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

```
!mkdir {HOME}/datasets
%cd {HOME}/datasets

!pip install roboflow --quiet
!pip install roboflow

from roboflow import Roboflow
rf = Roboflow(api_key="dLRZAgJmFiZR3V2thQxr")
project = rf.workspace("rmk-engineering-college-xfiwz").project("segmentation-of-tumor")
```

```
dataset = project.version(2).download("yolov5")
```

```
/content/datasets
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 57.4/57.4 kB 940.0 kB/s eta 0:00:00
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 155.3/155.3 kB 4.6 MB/s eta 0:00:00
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 58.8/58.8 kB 6.7 MB/s eta 0:00:00
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 67.8/67.8 kB 5.5 MB/s eta 0:00:00
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 55.6/55.6 kB 4.8 MB/s eta 0:00:00
  Preparing metadata (setup.py) ... done
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 54.5/54.5 kB 8.0 MB/s eta 0:00:00
  Building wheel for wget (setup.py) ... done
Requirement already satisfied: roboflow in /usr/local/lib/python3.10/dist-packages (1.1.2)
Requirement already satisfied: certifi==2022.12.7 in /usr/local/lib/python3.10/dist-packages (from roboflow) (2022.12.7)
Requirement already satisfied: chardet==4.0.0 in /usr/local/lib/python3.10/dist-packages (from roboflow) (4.0.0)
Requirement already satisfied: cycler==0.10.0 in /usr/local/lib/python3.10/dist-packages (from roboflow) (0.10.0)
Requirement already satisfied: idna==2.10 in /usr/local/lib/python3.10/dist-packages (from roboflow) (2.10)
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.10/dist-packages (from roboflow) (1.4.4)
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) (1.22.4)
Requirement already satisfied: opencv-python>=4.1.2 in /usr/local/lib/python3.10/dist-packages (from roboflow) (4.7.0.72)
Requirement already satisfied: Pillow>=7.1.2 in /usr/local/lib/python3.10/dist-packages (from roboflow) (8.4.0)
Requirement already satisfied: pyparsing==2.4.7 in /usr/local/lib/python3.10/dist-packages (from roboflow) (2.4.7)
Requirement already satisfied: python-dateutil in /usr/local/lib/python3.10/dist-packages (from roboflow) (2.8.2)
Requirement already satisfied: python-dotenv in /usr/local/lib/python3.10/dist-packages (from roboflow) (1.0.0)
Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from roboflow) (2.27.1)
Requirement already satisfied: six in /usr/local/lib/python3.10/dist-packages (from roboflow) (1.16.0)
Requirement already satisfied: supervision in /usr/local/lib/python3.10/dist-packages (from roboflow) (0.11.1)
Requirement already satisfied: urllib3>=1.26.6 in /usr/local/lib/python3.10/dist-packages (from roboflow) (1.26.16)
Requirement already satisfied: wget in /usr/local/lib/python3.10/dist-packages (from roboflow) (3.2)
Requirement already satisfied: tqdm>=4.41.0 in /usr/local/lib/python3.10/dist-packages (from roboflow) (4.65.0)
Requirement already satisfied: PyYAML>=5.3.1 in /usr/local/lib/python3.10/dist-packages (from roboflow) (6.0.1)
Requirement already satisfied: requests-toolbelt in /usr/local/lib/python3.10/dist-packages (from roboflow) (1.0.0)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow) (1.
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow) (4
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib->roboflow) (23.
Requirement already satisfied: charset-normalizer~=2.0.0 in /usr/local/lib/python3.10/dist-packages (from requests->robofl
loading Roboflow workspace...
loading Roboflow project...
Downloading Dataset Version Zip in segmentation-of-tumor-2 to yolov5pytorch: 100% [18978506 / 18978506] bytes
Extracting Dataset Version Zip to segmentation-of-tumor-2 in yolov5pytorch:: 100%|██████████| 2996/2996 [00:00<00:00, 3962
```

Custom Training

```
%cd {HOME}
```

```
!yolo task=segment mode=train model=yolov8s-seg.pt data={dataset.location}/data.yaml epochs=10 imgsz=640
```

```
      8/10      6.1G     0.6918      1.102     0.4869     0.9556         13        640: 100% 84/84 [00:37<00:00,  2.2
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP
                   all         99        104      0.919      0.872      0.934      0.696      0.904      0.865      0.9

      Epoch    GPU_mem   box_loss   seg_loss   cls_loss   dfl_loss  Instances       Size
      9/10      6.1G     0.6279      1.014     0.4408     0.9317         13        640: 100% 84/84 [00:35<00:00,  2.3
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP
                   all         99        104      0.909       0.86      0.948       0.71      0.898      0.851      0.9

      Epoch    GPU_mem   box_loss   seg_loss   cls_loss   dfl_loss  Instances       Size
      10/10     6.1G     0.5793      0.952     0.3824     0.9068         14        640: 100% 84/84 [00:37<00:00,  2.2
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP
                   all         99        104      0.938      0.885      0.943      0.724      0.938      0.885      0.9

10 epochs completed in 0.114 hours.
Optimizer stripped from runs/segment/train/weights/last.pt, 23.8MB
Optimizer stripped from runs/segment/train/weights/best.pt, 23.8MB

Validating runs/segment/train/weights/best.pt...
Ultralytics YOLOv8.0.28 🚀 Python-3.10.6 torch-2.0.1+cu118 CUDA:0 (Tesla T4, 15102MiB)
YOLOv8s-seg summary (fused): 195 layers, 11779987 parameters, 0 gradients, 42.4 GFLOPs
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP
                   all         99        104      0.939      0.885      0.943      0.724      0.939      0.885      0.9
Speed: 1.7ms pre-process, 8.7ms inference, 0.0ms loss, 3.2ms post-process per image
Results saved to runs/segment/train
```

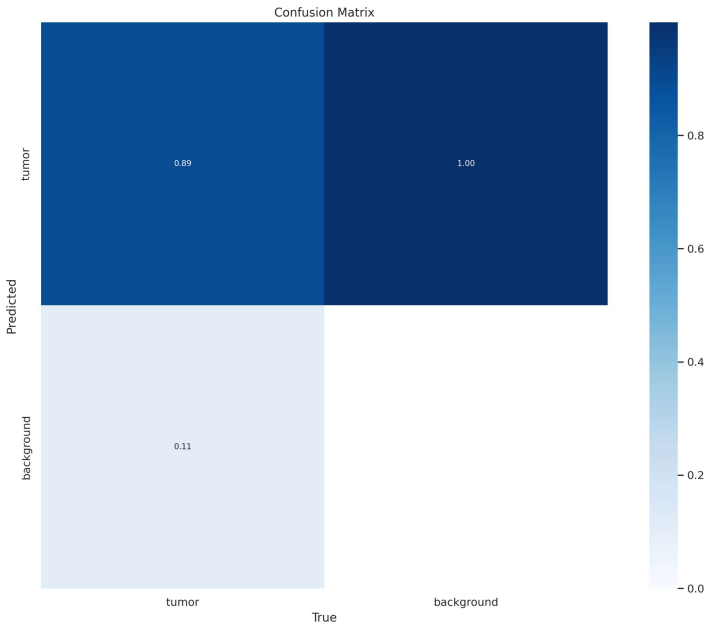
```
!ls {HOME}/runs/segment/train/
```

```
args.yaml                                       results.png
BoxF1_curve.png                                 train_batch0.jpg
BoxP_curve.png                                  train_batch1.jpg
BoxPR_curve.png                                 train_batch2.jpg
BoxR_curve.png                                  val_batch0_labels.jpg
confusion_matrix.png                            val_batch0_pred.jpg
events.out.tfevents.1690110116.0c8b14bf7400.1745.0  val_batch1_labels.jpg
MaskF1_curve.png                                val_batch1_pred.jpg
MaskP_curve.png                                 val_batch2_labels.jpg
MaskPR_curve.png                                val_batch2_pred.jpg
MaskR_curve.png                                 weights
results.csv
```

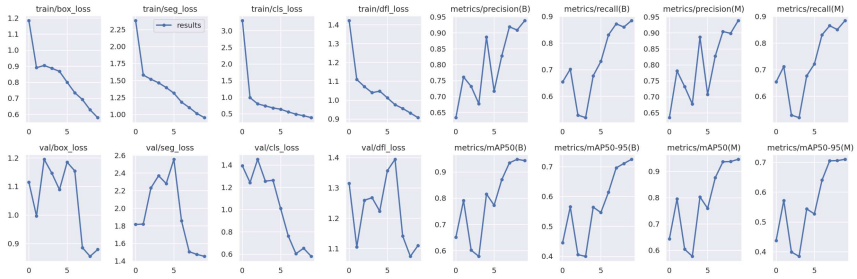
```
from PIL import Image
import requests
from io import BytesIO
import numpy as np
```

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

```
/content
```

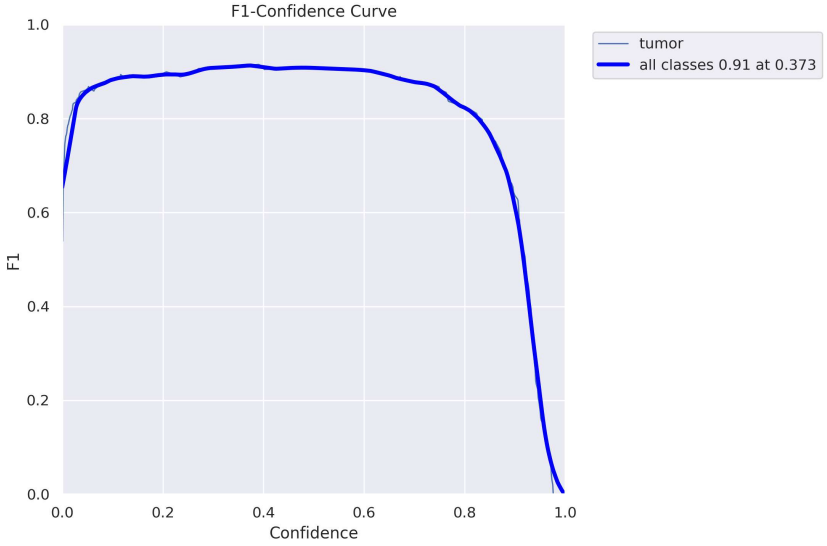


```
from IPython.display import Image, display

# Assuming the HOME variable contains the path to the home directory
image_path = f'{HOME}/runs/segment/train/results.png'

# Display the image
display(Image(filename=image_path, width=600))
```




```
%cd {HOME}
Image(filename=f'{HOME}/runs/segment/train/BoxF1_curve.png', width=600)
```

```
/content
```



Validate Custom Model

```
%cd {HOME}

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

```
/content
2023-07-23 11:24:17.468728: I tensorflow/core/platform/cpu_feature_guard.cc:182] This TensorFlow binary is optimized to us
To enable the following instructions: AVX2 AVX512F FMA, in other operations, rebuild TensorFlow with the appropriate compi
2023-07-23 11:24:18.394222: W tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not find TensorR
Ultralytics YOLOv8.0.28 🚀 Python-3.10.6 torch-2.0.1+cu118 CUDA:0 (Tesla T4, 15102MiB)
YOLOv8s-seg summary (fused): 195 layers, 11779987 parameters, 0 gradients, 42.4 GFLOPs
val: Scanning /content/datasets/segmentation-of-tumor-2/valid/labels.cache... 99 images, 0 backgrounds, 0 corrupt: 100% 99
                 Class     Images  Instances      Box(P          R      mAP50  mAP50-95)     Mask(P          R      mAP50
                   all         99        104      0.939      0.885      0.943      0.728      0.939      0.885      0.946
Speed: 3.6ms pre-process, 18.1ms inference, 0.0ms loss, 4.9ms post-process per image
```

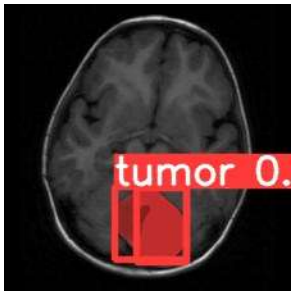
Inference with Custom Model

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

```
/content
2023-07-23 11:24:42.245589: I tensorflow/core/platform/cpu_feature_guard.cc:182] This TensorFlow binary is optimized to
```

```
To enable the following instructions: AVX2 AVX512F FMA, in other operations, rebuild TensorFlow with the appropriate co
2023-07-23 11:24:43.290453: W tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not find Tens
Ultralytics YOLOv8.0.28 🚀 Python-3.10.6 torch-2.0.1+cu118 CUDA:0 (Tesla T4, 15102MiB)
YOLOv8s-seg summary (fused): 195 layers, 11779987 parameters, 0 gradients, 42.4 GFLOPs

image 1/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_010_big_gallery_jpeg_jpg.rf.9555caeb1
image 2/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_13cb18c4f838d399687c21700188ac423210
image 3/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_158c06b16914d216641ccae5b41c37_big_ga
image 4/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_1eb857898f23c20fb29fe1df8a89b7_big_ga
image 5/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_1f1291f56ed59c15a34e1d62d40f8f94bfbce
image 6/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_2022-06-07-13_30_45-Window_jpg.rf.f6t
image 7/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_2022-06-07-13_30_52-Window_jpg.rf.8fe
image 8/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_2022-06-07-13_31_10-Window_jpg.rf.6f2
image 9/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_2022-06-07-13_31_18-Window_jpg.rf.6a3
image 10/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_2022-06-08-14_10_46-Window_jpg.rf.c5
image 11/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_26f898b3de55ef590a6181ad46e564_big_g
image 12/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_2eb1a60ea8e5288b3d2f9949d0c98b_big_g
image 13/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_3194bf10a35d373dea33ee977d8546_big_g
image 14/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_49ebf39227ccc0a8bd40f0d88c4bae_big_g
image 15/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_6215aefd87bed6355d80f524778e92bca3ce
image 16/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_95_big_gallery_jpeg_jpg.rf.ee720387
image 17/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_97b72205fa19b90b6d873cdbc53191_big_g
image 18/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_IMG-0010-00010_big_gallery_jpeg_jpg
image 19/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_IMG-0010-00012_big_gallery_jpeg_jpg
image 20/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_d5be55f80ec34b5113d74f2815a070_big_g
image 21/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_e5aee301a4442e1f8ba078f66cfc2f_big_g
image 22/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1C-_e5f6480fbd7d4de34999f88423b68b_big_g
image 23/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_1c0238417532d40ffca1c260427b39_big_gal
image 24/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_2022-06-08-14_08_00-Window_jpg.rf.a9a7
image 25/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_2022-06-08-14_08_13-Window_jpg.rf.b9ae
image 26/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_3f973d50f0905577f557158b298419_big_gal
image 27/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_5ae77565c80ab37342ee78017d3562_big_gal
image 28/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_64750f7d7ab568cc3b88d04cc9028ad90296e5
image 29/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_6bbe3a2a8f2dc72c73bca7f43af0e1_big_gal
image 30/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_73b16a482cc4803943c2a2e56665ea_big_gal
image 31/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_ab79c8df3e061b384fed723673e83cad4445b4
image 32/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_af2f1d6497d150ad7655f2828abba7_big_gal
image 33/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_astro_infraT-1-_jpg.rf.bba08bd00b235a9
image 34/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_astro_infraT-14-_jpeg_jpg.rf.fad831fb
image 35/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_astro_infraT-8-_jpeg_jpg.rf.c57f6b2c82
image 36/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_fa1e1dcca3fed9e2948c3fcf24166685c9efd1
image 37/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T1_fa4a29a7a1df280fa6e7aa5a0ad065_big_gal
image 38/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_0540bf7f7f3e549bd53f4c1df47d7c_big_gal
image 39/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_090d30e2f05b708fd42fa8a62d3a41_big_gal
image 40/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_1bdbaaaeb4462aef10df74be377c96_big_gal
image 41/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_2022-06-07-13_46_56-Window_jpg.rf.a022
image 42/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_2022-06-07-13_46_59-Window_jpg.rf.5c03
image 43/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_28_big_gallery_jpeg_jpg.rf.76ce8740dc1
image 44/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_30b9c1b831295ad3cacf950c9f634e_big_gal
image 45/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_36746410de2a874e6bb3696b3c994a_big_gal
image 46/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_721d6730a8ba39940676eef3b32cb1eb35fbe2
image 47/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_8ac92baf14eb41c7d6415e80d5afa6_big_gal
image 48/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_915ac6b86f7ca21449241901cb8bdb_big_gal
image 49/52 /content/datasets/segmentation-of-tumor-2/test/images/Astrocitoma_T2_c55f6894a0909edb2c288832f89ae6_big_gal
```

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

for image_path in glob.glob(f'{HOME}/runs/segment/predict/*.jpg')[:3]:
      display(Image(filename=image_path, height=200))
      print("\n")
```

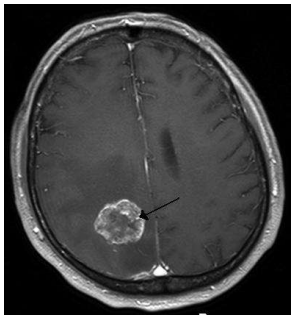



```
!yolo task=segment mode=predict model='/content/runs/segment/train/weights/best.pt' conf=0.25 source='/content/Hirnmetastase_MR
```

```
2023-07-23 11:31:30.645514: I tensorflow/core/platform/cpu_feature_guard.cc:182] This TensorFlow binary is optimized to us
To enable the following instructions: AVX2 AVX512F FMA, in other operations, rebuild TensorFlow with the appropriate compi
2023-07-23 11:31:31.558439: W tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not find TensorR
Ultralytics YOLOv8.0.28 🚀 Python-3.10.6 torch-2.0.1+cu118 CUDA:0 (Tesla T4, 15102MiB)
YOLOv8s-seg summary (fused): 195 layers, 11779987 parameters, 0 gradients, 42.4 GFLOPs

image 1/1 /content/Hirnmetastase_MRT-T1_KM.jpg: 640x608 1 tumor, 85.3ms
Speed: 0.7ms pre-process, 85.3ms inference, 94.4ms postprocess per image at shape (1, 3, 640, 640)
Results saved to runs/segment/predict2
```

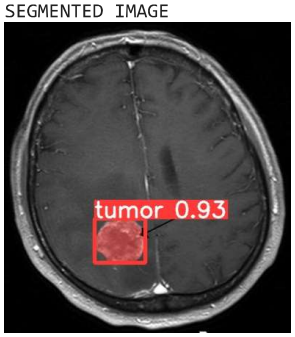
```
from IPython.display import Image, display

# Assuming the HOME variable contains the path to the home directory
image_path = f'/content/Hirnmetastase_MRT-T1_KM.jpg'
print("TEST IMAGE")
# Display the image
display(Image(filename=image_path, width=200))
```

```
TEST IMAGE
```



```
from IPython.display import Image, display

# Assuming the HOME variable contains the path to the home directory
image_path = f'/content/runs/segment/predict2/Hirnmetastase_MRT-T1_KM.jpg'
print("SEGMENTED IMAGE")
# Display the image
display(Image(filename=image_path, width=200))
```

```
SEGMENTED IMAGE
```



```
import torch
model = torch.load('/content/best.pt')
```

```
import os, random
# test_set_loc = dataset.location + "/content/datasets/cheque-1/test"
# random_test_image = random.choice(os.listdir(test_set_loc))
random_test_image = "/content/Hirnmetastase_MRT-T1_KM.jpg"
print("running inference on " + random_test_image)
pred = model.predict(random_test_image)
pred
```

```
running inference on /content/Hirnmetastase_MRT-T1_KM.jpg
image 1/1 /content/Hirnmetastase_MRT-T1_KM.jpg: 640x608 1 clock, 7158.7ms
Speed: 16.4ms pre-process, 7158.7ms inference, 57.0ms postprocess per image at shape (1, 3, 640, 640)
[Ultralytics YOLO <class 'ultralytics.yolo.engine.results.Boxes'> masks
 type: <class 'torch.Tensor'>
 shape: torch.Size([1, 6])
 dtype: torch.float32
  + tensor([[2.20000e+01, 1.20000e+01, 3.83000e+02, 4.19000e+02, 4.01432e-01, 7.40000e+01]], device='cuda:0')Ultralytics
YOLO <class 'ultralytics.yolo.engine.results.Masks'> masks
 type: <class 'torch.Tensor'>
 shape: torch.Size([1, 640, 608])
 dtype: torch.float32
  + tensor([[[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.]]], device='cuda:0')]
```

```
print(model.predict("/content/Hirnmetastase_MRT-T1_KM.jpg"))
```

```
# save an image annotated with your predictions
```

```
image 1/1 /content/Hirnmetastase_MRT-T1_KM.jpg: 640x608 1 clock, 22.6ms
Speed: 0.8ms pre-process, 22.6ms inference, 3.0ms postprocess per image at shape (1, 3, 640, 640)

image 1/1 /content/Hirnmetastase_MRT-T1_KM.jpg: 640x608 1 clock, 20.8ms
Speed: 0.5ms pre-process, 20.8ms inference, 2.0ms postprocess per image at shape (1, 3, 640, 640)
[Ultralytics YOLO <class 'ultralytics.yolo.engine.results.Boxes'> masks
type: <class 'torch.Tensor'>
shape: torch.Size([1, 6])
dtype: torch.float32
 + tensor([[2.20000e+01, 1.20000e+01, 3.83000e+02, 4.19000e+02, 4.01432e-01, 7.40000e+01]], device='cuda:0')Ultralytics YO
type: <class 'torch.Tensor'>
shape: torch.Size([1, 640, 608])
dtype: torch.float32
 + tensor([[[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.]]], device='cuda:0')]
[Ultralytics YOLO <class 'ultralytics.yolo.engine.results.Boxes'> masks
type: <class 'torch.Tensor'>
shape: torch.Size([1, 6])
dtype: torch.float32
 + tensor([[2.20000e+01, 1.20000e+01, 3.83000e+02, 4.19000e+02, 4.01432e-01, 7.40000e+01]], device='cuda:0')Ultralytics YO
type: <class 'torch.Tensor'>
shape: torch.Size([1, 640, 608])
dtype: torch.float32
 + tensor([[[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.]]], device='cuda:0')]
```

```
import torch
model = YOLO('/content/best.pt')
```

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