

# 视作组作业——王佳靖

学长你好！我是来自自动化与智能学院信号2302班的王佳靖，假期考核作业均已完成，下面是我对作业的展示和解释

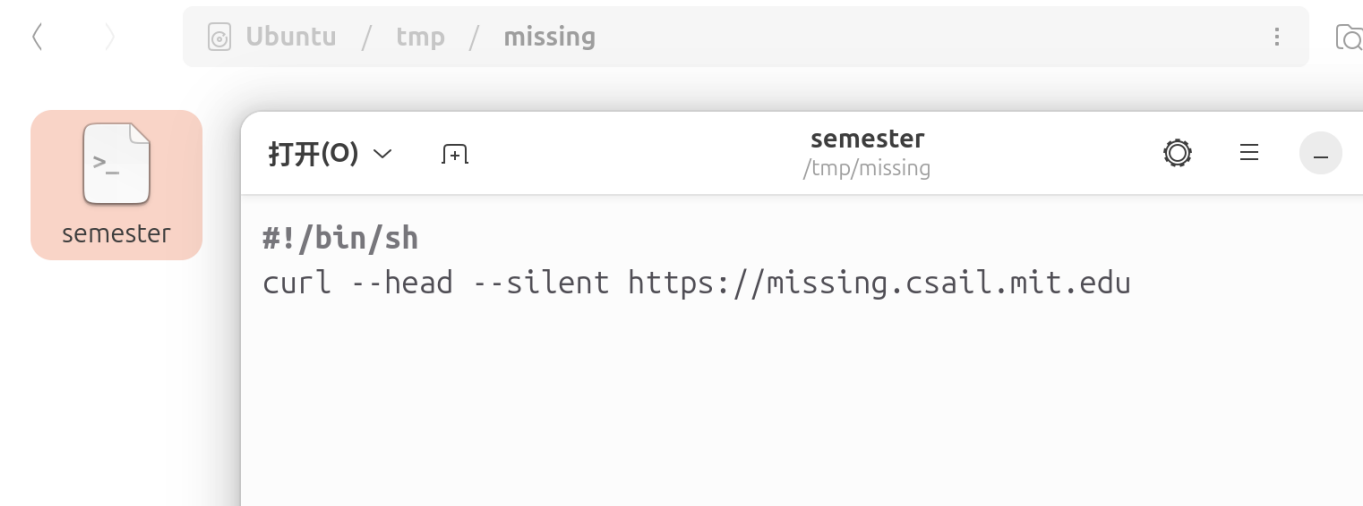
## P2作业

### task1

下图是对题目1-8的解答 说明：1.使用echo命令来查看程序是否正确。2.使用cd命令移动到tmp文件夹。3.使用mkdir命令创建名为missing的文件夹。4.使用touch创建semester文件。5.使用">"标志符向semester文件中写入文本。6.使用">>"标志符向semester文件中追加写入文本。7./semeter运行文件失败，是由于权限不够导致的。

```
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:~$ echo $SHELL
/bin/bash
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:~$ cd /tmp
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp$ mkdir missing
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp$ man touch
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp$ cd /tmp/missing
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp/missing$ touch semester
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp/missing$ echo '#!/bin/sh' > semester
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp/missing$ echo curl --head --silent https://missing.csail.mit.edu
u >> semester
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp/missing$ ./semester
bash: ./semester: 权限不够
```

下图是第5题的效果，可见相应的文本已经被写入了到了semester文件中。



8.使用sh命令，可以成功运行文件（not found应该是网址问题，实际上文件已经执行）为什么使用sh命令可以运行而./命令无法运行？我认为这是由于semester文件的第一行指定了sh解释器，所以这个文件就只能用sh命令来运行。

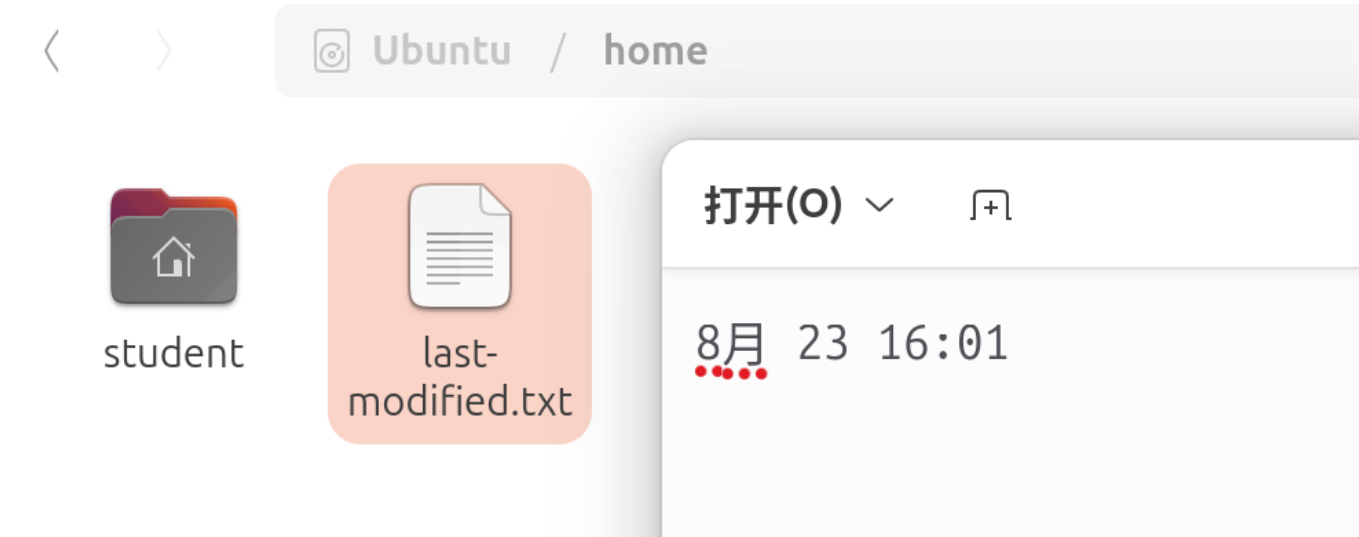
```
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp/missing$ ./semester
bash: ./semester: 权限不够
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp/missing$ sh semester
semester: 2: curl: not found
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp/missing$ man chmod
```

9.使用chmod命令赋予权限后，./指令就可以运行该文件了。

```
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp/missing$ chmod +x semester
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/tmp/missing$ ./semester
./semester: 2: curl: not found
```

下图是对题目9-11的解答

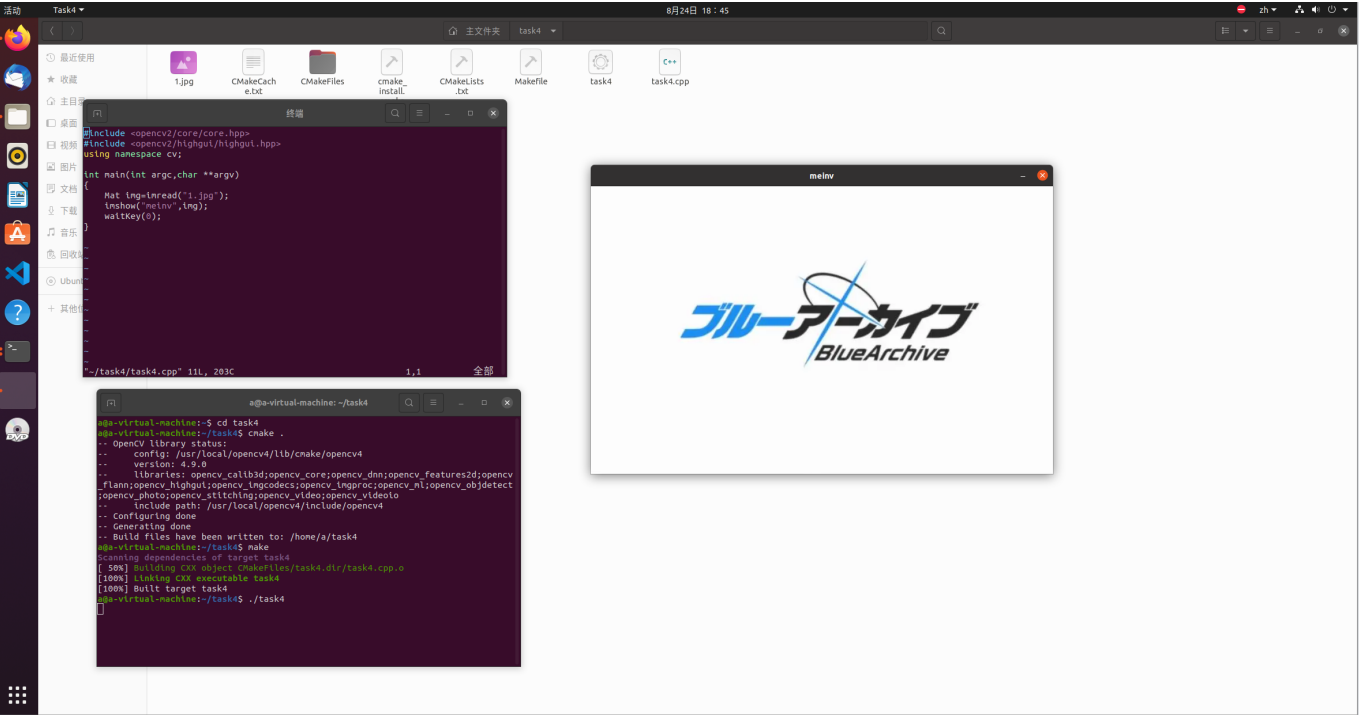
```
student@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/home$ sudo su
root@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/home# ls -l /tmp/missing/semester | cut -d ' ' -f 7,8,9 > last-modified.txt
```



```
root@student-ASUS-TUF-Gaming-F15-FX507VV-FX507VV:/sys# acpi -i
Battery 0: Full, 100%
Battery 0: design capacity 5305 mAh, last full capacity 4818 mAh = 90%
```

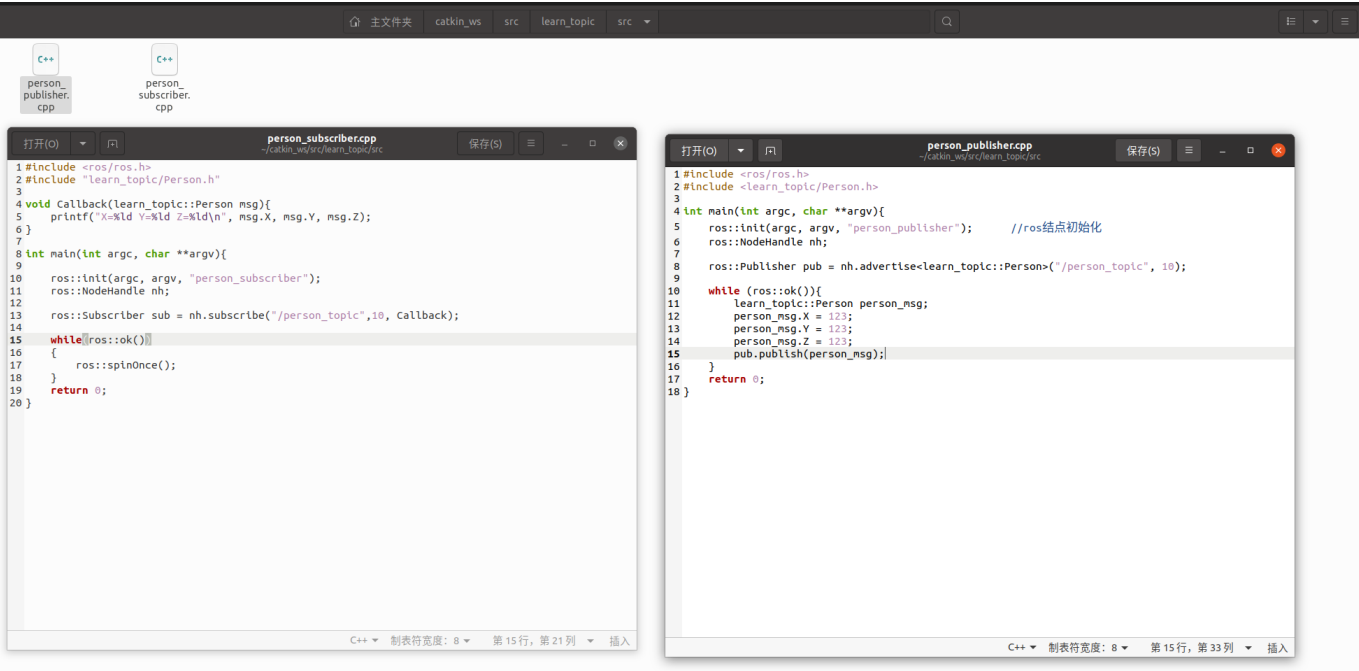
task4

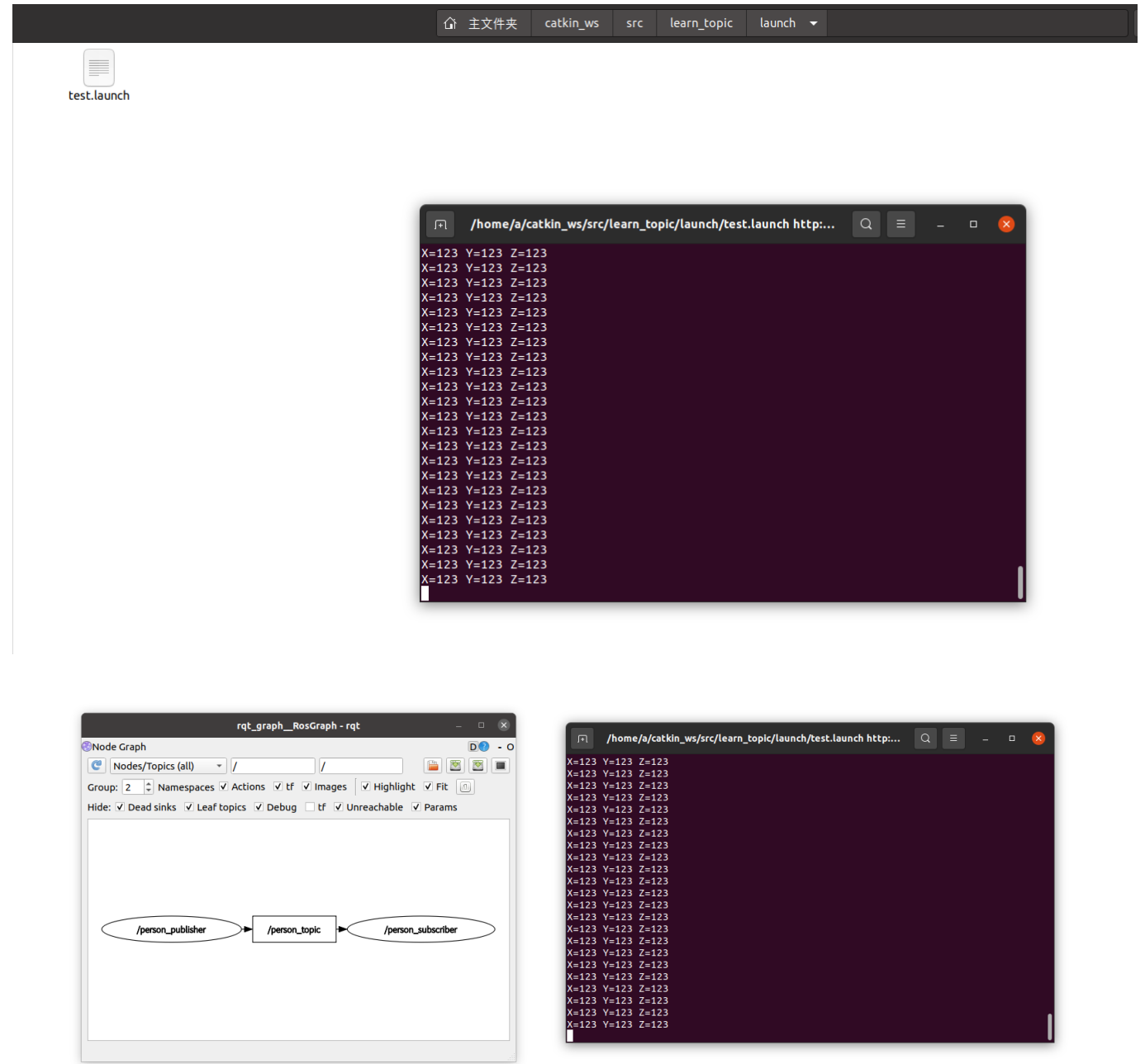
下图是使用opencv库通过cmake编译展示了一张碧蓝档案logo的图片，源代码已在图中展示。



P3作业

下面三张图片展示了运行效果和两个结点的源代码





首先我通过使用“鱼香ros”安装了ros1运行环境，然后创建了catkin\_ws作为工作空间，接下来在新建立的learn\_topic包里创建了名为Person.msg文件，准备自定义消息类型，消息类型为三个uint64变量。紧接着我分别在package.xml文件中加入了自定义消息类型所需要的包，在CMakeLists.txt文件中添加相应的包（generation和runtime）。在使用CMake完成编译后，在src文件夹中新建两个CPP文件作为订阅者和发布者，在发布者结点中使用advertise函数发布了消息类型为“Person”的名为“learn\_topic”的话题，内容为三个123数字，在订阅者结点中使用subscribe函数订阅了相应的话题，通过Callback函数把消息类型打印在屏幕上。由此，两个结点间的话题通信已经完成，运行效果如图，通过查看关系结点图可以发现两个结点之间通过话题“learn\_topic”进行通信。另附视频，视频中展示了源代码和运行流程

P4作业

## 下图是模型训练过程中和训练完成的截图

```
C:\Users\18231\Desktop\ultralytics-8.1.0>conda activate ultralytics

(ultralytics) C:\Users\18231\Desktop\ultralytics-8.1.0>yolo task=detect mode=train model=../yolov8n.pt data=yolo-bvn.yaml epochs=30 workers=1 batch=16
C:\Users\18231\Desktop\ultralytics-8.1.0\ultralytics\utils\checks.py:634: FutureWarning: You are using 'torch.load' with 'weights_only=False' (the current default value), which uses the default pickle module implicitly. It is possible to construct malicious pickle data which will execute arbitrary code during unpickling (See https://github.com/pytorch/pytorch/blob/main/SECURITY.md#untrusted-models for more details). In a future release, the default value for 'weights_only' will be flipped to 'True'. This limits the functions that could be executed during unpickling. Arbitrary objects will no longer be allowed to be loaded via this mode unless they are explicitly allowedlist by the user via 'torch.serialization.add_safe_globals'. We recommend you start setting 'weights_only=True' for any use case where you don't have full control of the loaded file. Please open an issue on GitHub for any issues related to this experimental feature.
  return torch.load(file, map_location="cpu"), file
New https://pypi.org/project/ultralytics/8.2.82 available Update with 'pip install -U ultralytics'
Ultralytics YOLOv8.1.0 Python-3.9.19 torch-2.4.0+cu118 CUDA:0 (NVIDIA GeForce RTX 4060 Laptop GPU, 8188MiB)
engine\trainer: task=detect, mode=train, model=../yolov8n.pt, data=yolo-bvn.yaml, epochs=30, time=None, patience=50, batch=16, imgs=640, save=True, save_period=1, cache=False, device=None, workers=1, project=None, name=train4, 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=False, opset=None, workspace=4, nms=False, lr=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, flipudlr=0.5, mosaic=1.0, mixup=0.0, copy_paste=0.0, auto_augment=randaugument, erasing=0.4, crop_fraction=1.0, cfg=None, tracker=botssort.yaml, save_dir=runs\detect\train4
Overriding model.yaml nc=80 with nc=3

      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   7360  ultralytics.nn.modules.block.C2f  [32, 32, 1, True]
3         -1  1  18560  ultralytics.nn.modules.conv.Conv  [32, 64, 3, 2]
4         -1  2  49664  ultralytics.nn.modules.block.C2f  [64, 64, 2, True]
5         -1  1  73984  ultralytics.nn.modules.conv.Conv  [64, 128, 3, 2]
6         -1  2 197632  ultralytics.nn.modules.block.C2f  [128, 128, 2, True]
7         -1  1 295424  ultralytics.nn.modules.conv.Conv  [128, 256, 3, 2]
8         -1  1 460288  ultralytics.nn.modules.block.C2f  [256, 256, 1, True]
9         -1  1 164608  ultralytics.nn.modules.block.SPPF  [256, 256, 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 148224  ultralytics.nn.modules.block.C2f  [384, 128, 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  37248  ultralytics.nn.modules.block.C2f  [192, 64, 1]
16        -1  1  36992  ultralytics.nn.modules.conv.Conv  [64, 64, 3, 2]
17       [-1, 12] 1      0  ultralytics.nn.modules.conv.Concat  [1]
18        -1  1 123648  ultralytics.nn.modules.block.C2f  [192, 128, 1]
19        -1  1 147712  ultralytics.nn.modules.conv.Conv  [128, 128, 3, 2]
20       [-1, 9] 1      0  ultralytics.nn.modules.conv.Concat  [1]
21        -1  1 493056  ultralytics.nn.modules.block.C2f  [384, 256, 1]
22       [15, 18, 21] 1 751897  ultralytics.nn.modules.head.Detect  [3, [64, 128, 256]]
Model summary: 225 layers, 3011433 parameters, 3011417 gradients, 8.2 GFLOPs

Transferred 319/355 items from pretrained weights
TensorBoard: Start with 'tensorboard --logdir runs\detect\train4', view at http://localhost:6006/
Freezing layer 'model.22.dfl.conv.weight'
AMP: running Automatic Mixed Precision (AMP) checks with YOLOv8n...
C:\Users\18231\Desktop\ultralytics-8.1.0\ultralytics\utils\checks.py:634: FutureWarning: You are using 'torch.load' with 'weights_only=False' (the current default value), which uses the default pickle module implicitly. It is possible to construct malicious pickle data which will execute arbitrary code during unpickling (See https://github.com/pytorch/pytorch/blob/main/SECURITY.md#untrusted-models for more details). In a future release, the default value for 'weights_only' will be flipped to 'True'. This limits the functions that could be executed during unpickling. Arbitrary objects will no longer be allowed to be loaded via this mode unless they are explicitly allowedlist by the user via 'torch.serialization.add_safe_globals'. We recommend you start setting 'weights_only=True' for any use case where you don't have full control of the loaded file. Please open an issue on GitHub for any issues related to this experimental feature.
  return torch.load(file, map_location="cpu"), file
C:\Users\18231\Desktop\ultralytics-8.1.0\ultralytics\utils\checks.py:638: FutureWarning: 'torch.cuda.amp.autocast(args...)' is deprecated. Please use 'torch.amp.autocast('cuda', args...)' instead.
  with torch.cuda.amp.autocast(True):
AMP: checks passed
C:\Users\18231\Desktop\ultralytics-8.1.0\ultralytics\engine\trainer.py:271: FutureWarning: 'torch.cuda.amp.GradScaler(args...)' is deprecated. Please use 'torch.amp.GradScaler('cuda', args...)' instead.
  self.scaler = torch.cuda.amp.GradScaler(enabled=self.amp)
train: Scanning C:\Users\18231\Desktop\ultralytics-8.1.0\datasets\bvn\labels\train.cache... 96 images, 0 backgrounds, 0 corrupt: 100% [██████████] 96/96 [00:00<, ?it/s]
val: Scanning C:\Users\18231\Desktop\ultralytics-8.1.0\datasets\bvn\labels\val.cache... 21 images, 0 backgrounds, 0 corrupt: 100% [██████████] 21/21 [00:00<, ?it/s]
Plotting labels to runs\detect\train4\labels.jpg...
optimizer: 'optimizer=auto' found, ignoring 'lr=0.01' and 'momentum=0.937' and determining best 'optimizer', 'lr0' and 'momentum' automatically...
optimizer: AdamW(lr=0.001429, momentum=0.9) with parameter groups 57 weight(decay=0.0), 64 weight(decay=0.0005), 63 bias(decay=0.0)
30 epochs...

Epoch    GPU mem  box_loss  cls_loss  dfl_loss  Instances  Size
1/30      2.48G   1.656    3.793     1.4        153        640: 100% [██████████] 6/6 [00:03<00:00, 1.88it/s]
Class     Images  Instances  Box(P   R   mAP50  mAP50-95): 100% [██████████] 1/1 [00:00<00:00, 3.18it/s]
all       21      119      0.0062  0.366  0.0317  0.0235

Epoch    GPU mem  box_loss  cls_loss  dfl_loss  Instances  Size
2/30      2.47G   1.644    3.227     1.266      139        640: 100% [██████████] 6/6 [00:01<00:00, 3.03it/s]
Class     Images  Instances  Box(P   R   mAP50  mAP50-95): 100% [██████████] 1/1 [00:00<00:00, 3.76it/s]
all       21      119      0.0128  0.682  0.139   0.0852

30 epochs completed in 0.014 hours.
Optimizer stripped from runs\detect\train4\weights\last.pt, 6.2MB
Optimizer stripped from runs\detect\train4\weights\best.pt, 6.2MB

Validating runs\detect\train4\weights\best.pt...
Ultralytics YOLOv8.1.0 Python-3.9.19 torch-2.4.0+cu118 CUDA:0 (NVIDIA GeForce RTX 4060 Laptop GPU, 8188MiB)
Model summary (fused): 168 layers, 3006233 parameters, 0 gradients, 8.1 GFLOPs
```

首先我在miniconda官网安装了miniconda，然后打开Anaconda Prompt终端，在里面输入指令安装ultralytics Python3.9版本，然后在清华镜像网站上安装了pypi，然后在官网安装了pytorch，最后在vscode中完成环境配置。在完成环境配置后，我参考了test文件中的data.yaml中的标注顺序，在make sence网站中对100多个图片进行了标注，标注完成后我把生成的txt文件导入到了labels文件夹中。然后打开vscode，在编译器中创建了yolo-bvn.yaml对训练进行配置，配置完成后在终端中输入相应命令对模型进行训练，训练完成后得到.pt文件。训练模型和.pt文件存放在detect文件夹中。