In [1]:
```python
import torch
from matplotlib import pyplot as plt
import numpy as np
import cv2
```

In [2]:
```python
import uuid   # Unique identifier
import os
import time
```

In [14]:
```python
IMAGES_PATH = os.path.join('data', 'images') #/data/images
labels = ['awake', 'drowsy']
number_imgs = 20
```

In [15]:
```python
cap = cv2.VideoCapture(0)
# Loop through labels
for label in labels:
    print('Collecting images for {}'.format(label))
    time.sleep(5)

    # Loop through image range
    for img_num in range(number_imgs):
        print('Collecting images for {}, image number {}'.format(label, img_num))

        # Webcam feed
        ret, frame = cap.read()

        # Naming out image path
        imgname = os.path.join(IMAGES_PATH, label+'.'+str(uuid.uuid1())+'.jpg')

        # Writes out image to file
        cv2.imwrite(imgname, frame)

        # Render to the screen
        cv2.imshow('Image Collection', frame)

        # 2 second delay between captures
        time.sleep(2)

        if cv2.waitKey(10) & 0xFF == ord('q'):
            break
cap.release()
cv2.destroyAllWindows()
```

```
Collecting images for awake
Collecting images for awake, image number 0
Collecting images for awake, image number 1
Collecting images for awake, image number 2
Collecting images for awake, image number 3
Collecting images for awake, image number 4
Collecting images for awake, image number 5
Collecting images for awake, image number 6
Collecting images for awake, image number 7
Collecting images for awake, image number 8
Collecting images for awake, image number 9
Collecting images for awake, image number 10
Collecting images for awake, image number 11
Collecting images for awake, image number 12
Collecting images for awake, image number 13
Collecting images for awake, image number 14
Collecting images for awake, image number 15
Collecting images for awake, image number 16
Collecting images for awake, image number 17
Collecting images for awake, image number 18
Collecting images for awake, image number 19
Collecting images for drowsy
Collecting images for drowsy, image number 0
Collecting images for drowsy, image number 1
Collecting images for drowsy, image number 2
Collecting images for drowsy, image number 3
Collecting images for drowsy, image number 4
Collecting images for drowsy, image number 5
Collecting images for drowsy, image number 6
Collecting images for drowsy, image number 7
Collecting images for drowsy, image number 8
Collecting images for drowsy, image number 9
Collecting images for drowsy, image number 10
Collecting images for drowsy, image number 11
Collecting images for drowsy, image number 12
Collecting images for drowsy, image number 13
Collecting images for drowsy, image number 14
Collecting images for drowsy, image number 15
Collecting images for drowsy, image number 16
Collecting images for drowsy, image number 17
Collecting images for drowsy, image number 18
Collecting images for drowsy, image number 19
```

In [16]:
```python
print(os.path.join(IMAGES_PATH, labels[0]+'.'+str(uuid.uuid1())+'.jpg'))
```

```
data\images\awake.eb3f0a8d-2fd8-11ec-952d-4cebbd4e1c38.jpg
```

In [17]:
```python
for label in labels:
    print('Collecting images for {}'.format(label))
    for img_num in range(number_imgs):
        print('Collecting images for {}, image number {}'.format(label, img_num))
        imgname = os.path.join(IMAGES_PATH, label+'.'+str(uuid.uuid1())+'.jpg')
        print(imgname)
```

```
Collecting images for awake
Collecting images for awake, image number 0
data\images\awake.f2f36563-2fd8-11ec-bb4e-4cebbd4e1c38.jpg
Collecting images for awake, image number 1
data\images\awake.f2f36564-2fd8-11ec-9038-4cebbd4e1c38.jpg
Collecting images for awake, image number 2
data\images\awake.f2f38bda-2fd8-11ec-b5e1-4cebbd4e1c38.jpg
Collecting images for awake, image number 3
data\images\awake.f2f38bdb-2fd8-11ec-8747-4cebbd4e1c38.jpg
Collecting images for awake, image number 4
data\images\awake.f2f38bdc-2fd8-11ec-b8e1-4cebbd4e1c38.jpg
Collecting images for awake, image number 5
data\images\awake.f2f38bdd-2fd8-11ec-b278-4cebbd4e1c38.jpg
Collecting images for awake, image number 6
data\images\awake.f2f38bde-2fd8-11ec-bad5-4cebbd4e1c38.jpg
Collecting images for awake, image number 7
data\images\awake.f2f38bdf-2fd8-11ec-812a-4cebbd4e1c38.jpg
Collecting images for awake, image number 8
data\images\awake.f2f38be0-2fd8-11ec-8e24-4cebbd4e1c38.jpg
Collecting images for awake, image number 9
data\images\awake.f2f38be1-2fd8-11ec-a29c-4cebbd4e1c38.jpg
Collecting images for awake, image number 10
data\images\awake.f2f38be2-2fd8-11ec-be61-4cebbd4e1c38.jpg
Collecting images for awake, image number 11
data\images\awake.f2f3b2c7-2fd8-11ec-a28a-4cebbd4e1c38.jpg
Collecting images for awake, image number 12
data\images\awake.f2f3b2c8-2fd8-11ec-a0cb-4cebbd4e1c38.jpg
Collecting images for awake, image number 13
data\images\awake.f2f3b2c9-2fd8-11ec-9aa9-4cebbd4e1c38.jpg
Collecting images for awake, image number 14
data\images\awake.f2f3b2ca-2fd8-11ec-be69-4cebbd4e1c38.jpg
Collecting images for awake, image number 15
data\images\awake.f2f3b2cb-2fd8-11ec-8d2a-4cebbd4e1c38.jpg
Collecting images for awake, image number 16
data\images\awake.f2f3b2cc-2fd8-11ec-aa89-4cebbd4e1c38.jpg
Collecting images for awake, image number 17
data\images\awake.f2f3b2cd-2fd8-11ec-b4b3-4cebbd4e1c38.jpg
Collecting images for awake, image number 18
data\images\awake.f2f3b2ce-2fd8-11ec-a52e-4cebbd4e1c38.jpg
Collecting images for awake, image number 19
data\images\awake.f2f3b2cf-2fd8-11ec-8556-4cebbd4e1c38.jpg
Collecting images for drowsy
Collecting images for drowsy, image number 0
data\images\drowsy.f2f3b2d0-2fd8-11ec-9ec1-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 1
data\images\drowsy.f2f3d9d0-2fd8-11ec-b1f2-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 2
data\images\drowsy.f2f3d9d1-2fd8-11ec-9ade-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 3
data\images\drowsy.f2f3d9d2-2fd8-11ec-87b1-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 4
data\images\drowsy.f2f3d9d3-2fd8-11ec-8199-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 5
data\images\drowsy.f2f3d9d4-2fd8-11ec-8b55-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 6
data\images\drowsy.f2f400f2-2fd8-11ec-b394-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 7
data\images\drowsy.f2f400f3-2fd8-11ec-82cc-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 8
data\images\drowsy.f2f400f4-2fd8-11ec-9b47-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 9
data\images\drowsy.f2f400f5-2fd8-11ec-908b-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 10
data\images\drowsy.f2f400f6-2fd8-11ec-8da9-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 11
data\images\drowsy.f2f400f7-2fd8-11ec-86f9-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 12
data\images\drowsy.f2f400f8-2fd8-11ec-9a62-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 13
data\images\drowsy.f2f400f9-2fd8-11ec-8b06-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 14
data\images\drowsy.f2f427e1-2fd8-11ec-93af-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 15
data\images\drowsy.f2f427e2-2fd8-11ec-bb60-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 16
data\images\drowsy.f2f427e3-2fd8-11ec-927b-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 17
data\images\drowsy.f2f427e4-2fd8-11ec-8d87-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 18
data\images\drowsy.f2f427e5-2fd8-11ec-98fe-4cebbd4e1c38.jpg
Collecting images for drowsy, image number 19
data\images\drowsy.f2f427e6-2fd8-11ec-8349-4cebbd4e1c38.jpg
```

In [19]:
```
!git clone https://github.com/tzutalin/labelImg
```

```
Cloning into 'labelImg'...
```

In [21]:
```
!pip install pyqt5 lxml --upgrade
!cd labelImg && pyrcc5 -o libs/resources.py resources.qrc
```

```
Requirement already satisfied: pyqt5 in c:\users\hp\anaconda3\lib\site-packages (5.15.4)
Requirement already satisfied: lxml in c:\users\hp\anaconda3\lib\site-packages (4.6.3)
Requirement already satisfied: PyQt5-sip<13,>=12.8 in c:\users\hp\anaconda3\lib\site-packages (from pyqt5) (12.9.0)
Requirement already satisfied: PyQt5-Qt5>=5.15 in c:\users\hp\anaconda3\lib\site-packages (from pyqt5) (5.15.2)
```

In [25]:
```
!cd yolov5 && python train.py --img 320 --batch 16 --epochs 5 --data datasets.yaml --weights yolov5s.pt --workers 2
```

```
YOLOv5  v6.0-16-g6d9b99f torch 1.8.2+cu102 CPU
train: weights=yolov5s.pt, cfg=, data=datasets.yaml, hyp=data\hyps\hyp.scratch.yaml, epochs=5, batch_size=16, imgsz=320, rect=False, resume=False, nosave=Fals
e, noval=False, noautoanchor=False, evolve=None, bucket=, cache=None, image_weights=False, device=, multi_scale=False, single_cls=False, adam=False, sync_bn=F
alse, workers=2, project=runs\train, name=exp, exist_ok=False, quad=False, linear_lr=False, label_smoothing=0.0, patience=100, freeze=0, save_period=-1, local
_rank=-1, entity=None, upload_dataset=False, bbox_interval=-1, artifact_alias=latest
github:  YOLOv5 is out of date by 1 commit. Use `git pull` or `git clone https://github.com/ultralytics/yolov5` to update.
Weights & Biases: run 'pip install wandb' to automatically track and visualize YOLOv5  runs (RECOMMENDED)
Plotting labels...

autoanchor: Analyzing anchors... anchors/target = 5.65, Best Possible Recall (BPR) = 1.0000
                 all         40         40    0.00288        0.2    0.00203   0.000461
                 all         40         40    0.00318      0.225    0.00234   0.000578
                 all         40         40    0.00377      0.275     0.0032   0.000676
                 all         40         40    0.00441      0.325    0.00405   0.000759
                 all         40         40    0.00483       0.35    0.00505    0.00087
Optimizer stripped from runs\train\exp11\weights\last.pt, 14.4MB
Optimizer stripped from runs\train\exp11\weights\best.pt, 14.4MB
                 all         40         40    0.00485       0.35      0.005   0.000894
               awake         40         20          0          0          0          0
              drowsy         40         20    0.00971        0.7       0.01    0.00179

hyperparameters: lr0=0.01, lrf=0.1, momentum=0.937, weight_decay=0.0005, warmup_epochs=3.0, warmup_momentum=0.8, warmup_bias_lr=0.1, box=0.05, cls=0.5, cls_pw
=1.0, obj=1.0, obj_pw=1.0, iou_t=0.2, anchor_t=4.0, fl_gamma=0.0, hsv_h=0.015, hsv_s=0.7, hsv_v=0.4, degrees=0.0, translate=0.1, scale=0.5, shear=0.0, perspec
tive=0.0, flipud=0.0, fliplr=0.5, mosaic=1.0, mixup=0.0, copy_paste=0.0
TensorBoard: Start with 'tensorboard --logdir runs\train', view at http://localhost:6006/
Overriding model.yaml nc=80 with nc=17

                 from  n    params  module                                  arguments
  0                -1  1      3520  models.common.Conv                      [3, 32, 6, 2, 2]
  1                -1  1     18560  models.common.Conv                      [32, 64, 3, 2]
  2                -1  1     18816  models.common.C3                        [64, 64, 1]
  3                -1  1     73984  models.common.Conv                      [64, 128, 3, 2]
  4                -1  2    115712  models.common.C3                        [128, 128, 2]
  5                -1  1    295424  models.common.Conv                      [128, 256, 3, 2]
  6                -1  3    625152  models.common.C3                        [256, 256, 3]
  7                -1  1   1180672  models.common.Conv                      [256, 512, 3, 2]
  8                -1  1   1182720  models.common.C3                        [512, 512, 1]
  9                -1  1    656896  models.common.SPPF                      [512, 512, 5]
 10                -1  1    131584  models.common.Conv                      [512, 256, 1, 1]
 11                -1  1         0  torch.nn.modules.upsampling.Upsample    [None, 2, 'nearest']
 12           [-1, 6]  1         0  models.common.Concat                    [1]
 13                -1  1    361984  models.common.C3                        [512, 256, 1, False]
 14                -1  1     33024  models.common.Conv                      [256, 128, 1, 1]
 15                -1  1         0  torch.nn.modules.upsampling.Upsample    [None, 2, 'nearest']
 16           [-1, 4]  1         0  models.common.Concat                    [1]
 17                -1  1     90880  models.common.C3                        [256, 128, 1, False]
 18                -1  1    147712  models.common.Conv                      [128, 128, 3, 2]
 19          [-1, 14]  1         0  models.common.Concat                    [1]
 20                -1  1    296448  models.common.C3                        [256, 256, 1, False]
 21                -1  1    590336  models.common.Conv                      [256, 256, 3, 2]
 22          [-1, 10]  1         0  models.common.Concat                    [1]
 23                -1  1   1182720  models.common.C3                        [512, 512, 1, False]
 24      [17, 20, 23]  1     59334  models.yolo.Detect                      [17, [[10, 13, 16, 30, 33, 23], [30, 61, 62, 45, 59, 119], [116, 90, 156, 198, 37
3, 326]], [128, 256, 512]]
Model Summary: 270 layers, 7065478 parameters, 7065478 gradients, 16.0 GFLOPs

Transferred 343/349 items from yolov5s.pt
Scaled weight_decay = 0.0005
optimizer: SGD with parameter groups 57 weight, 60 weight (no decay), 60 bias

train: Scanning '..\data\labels' images and labels...:   0%|          | 0/40 [00:00<?, ?it/s]
train: Scanning '..\data\labels' images and labels...1 found, 0 missing, 0 empty, 0 corrupted:   2%|2         | 1/40 [00:13<08:41, 13.36s/it]
train: Scanning '..\data\labels' images and labels...2 found, 0 missing, 0 empty, 0 corrupted:   5%|5         | 2/40 [00:13<03:41,  5.84s/it]
train: Scanning '..\data\labels' images and labels...23 found, 0 missing, 0 empty, 0 corrupted:  57%|#####7    | 23/40 [00:14<00:05,  3.10it/s]
train: Scanning '..\data\labels' images and labels...30 found, 0 missing, 0 empty, 0 corrupted:  75%|#######5  | 30/40 [00:14<00:02,  4.19it/s]
train: Scanning '..\data\labels' images and labels...40 found, 0 missing, 0 empty, 0 corrupted: 100%|##########| 40/40 [00:14<00:00,  2.76it/s]
train: New cache created: ..\data\labels.cache

val: Scanning '..\data\labels.cache' images and labels... 40 found, 0 missing, 0 empty, 0 corrupted: 100%|##########| 40/40 [00:00<?, ?it/s]
val: Scanning '..\data\labels.cache' images and labels... 40 found, 0 missing, 0 empty, 0 corrupted: 100%|##########| 40/40 [00:15<?, ?it/s]
Image sizes 320 train, 320 val
Using 2 dataloader workers
Logging results to runs\train\exp11
Starting training for 5 epochs...

     Epoch   gpu_mem       box       obj       cls    labels  img_size

  0%|          | 0/3 [00:00<?, ?it/s]
       0/4        0G    0.1185   0.01441   0.07976        32       320:   0%|          | 0/3 [00:08<?, ?it/s]
       0/4        0G    0.1185   0.01441   0.07976        32       320:  33%|###3      | 1/3 [00:16<00:32, 16.15s/it]
       0/4        0G    0.1172   0.01573   0.07936        35       320:  33%|###3      | 1/3 [00:23<00:32, 16.15s/it]
       0/4        0G    0.1172   0.01573   0.07936        35       320:  67%|######6   | 2/3 [00:23<00:11, 11.20s/it]
       0/4        0G    0.1159   0.01469    0.0803        11       320:  67%|######6   | 2/3 [00:28<00:11, 11.20s/it]
       0/4        0G    0.1159   0.01469    0.0803        11       320: 100%|##########| 3/3 [00:28<00:00,  8.10s/it]
       0/4        0G    0.1159   0.01469    0.0803        11       320: 100%|##########| 3/3 [00:28<00:00,  9.43s/it]

               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:   0%|          | 0/2 [00:00<?, ?it/s]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:  50%|#####     | 1/2 [00:07<00:07,  7.25s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:08<00:00,  3.86s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:08<00:00,  4.37s/it]

     Epoch   gpu_mem       box       obj       cls    labels  img_size

  0%|          | 0/3 [00:00<?, ?it/s]
       1/4        0G    0.1189   0.01522   0.07801        35       320:   0%|          | 0/3 [00:07<?, ?it/s]
       1/4        0G    0.1189   0.01522   0.07801        35       320:  33%|###3      | 1/3 [00:07<00:15,  7.92s/it]
       1/4        0G      0.12   0.01477   0.07837        30       320:  33%|###3      | 1/3 [00:15<00:15,  7.92s/it]
       1/4        0G      0.12   0.01477   0.07837        30       320:  67%|######6   | 2/3 [00:15<00:07,  7.78s/it]
       1/4        0G    0.1178   0.01479   0.07804        15       320:  67%|######6   | 2/3 [00:19<00:07,  7.78s/it]
       1/4        0G    0.1178   0.01479   0.07804        15       320: 100%|##########| 3/3 [00:19<00:00,  6.04s/it]
       1/4        0G    0.1178   0.01479   0.07804        15       320: 100%|##########| 3/3 [00:19<00:00,  6.52s/it]

               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:   0%|          | 0/2 [00:00<?, ?it/s]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:  50%|#####     | 1/2 [00:05<00:05,  5.42s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:06<00:00,  3.13s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:06<00:00,  3.47s/it]

     Epoch   gpu_mem       box       obj       cls    labels  img_size

  0%|          | 0/3 [00:00<?, ?it/s]
       2/4        0G    0.1142    0.0166   0.08022        34       320:   0%|          | 0/3 [00:07<?, ?it/s]
       2/4        0G    0.1142    0.0166   0.08022        34       320:  33%|###3      | 1/3 [00:07<00:15,  7.87s/it]
       2/4        0G    0.1124   0.01562   0.07956        28       320:  33%|###3      | 1/3 [00:15<00:15,  7.87s/it]
       2/4        0G    0.1124   0.01562   0.07956        28       320:  67%|######6   | 2/3 [00:15<00:07,  7.69s/it]
       2/4        0G     0.114   0.01634   0.07874        21       320:  67%|######6   | 2/3 [00:19<00:07,  7.69s/it]
       2/4        0G     0.114   0.01634   0.07874        21       320: 100%|##########| 3/3 [00:19<00:00,  6.13s/it]
       2/4        0G     0.114   0.01634   0.07874        21       320: 100%|##########| 3/3 [00:19<00:00,  6.57s/it]

               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:   0%|          | 0/2 [00:00<?, ?it/s]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:  50%|#####     | 1/2 [00:05<00:05,  5.34s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:06<00:00,  2.95s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:06<00:00,  3.31s/it]

     Epoch   gpu_mem       box       obj       cls    labels  img_size

  0%|          | 0/3 [00:00<?, ?it/s]
       3/4        0G    0.1101   0.01712   0.07608        34       320:   0%|          | 0/3 [00:07<?, ?it/s]
       3/4        0G    0.1101   0.01712   0.07608        34       320:  33%|###3      | 1/3 [00:07<00:14,  7.37s/it]
       3/4        0G    0.1118   0.01597   0.07737        28       320:  33%|###3      | 1/3 [00:14<00:14,  7.37s/it]
       3/4        0G    0.1118   0.01597   0.07737        28       320:  67%|######6   | 2/3 [00:14<00:07,  7.48s/it]
       3/4        0G    0.1117   0.01651   0.07708        17       320:  67%|######6   | 2/3 [00:19<00:07,  7.48s/it]
       3/4        0G    0.1117   0.01651   0.07708        17       320: 100%|##########| 3/3 [00:19<00:00,  6.16s/it]
       3/4        0G    0.1117   0.01651   0.07708        17       320: 100%|##########| 3/3 [00:19<00:00,  6.50s/it]

               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:   0%|          | 0/2 [00:00<?, ?it/s]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:  50%|#####     | 1/2 [00:05<00:05,  5.60s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:07<00:00,  3.27s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:07<00:00,  3.62s/it]

     Epoch   gpu_mem       box       obj       cls    labels  img_size

  0%|          | 0/3 [00:00<?, ?it/s]
       4/4        0G    0.1109   0.01486    0.0771        28       320:   0%|          | 0/3 [00:08<?, ?it/s]
       4/4        0G    0.1109   0.01486    0.0771        28       320:  33%|###3      | 1/3 [00:08<00:16,  8.32s/it]
       4/4        0G      0.11   0.01649   0.07595        39       320:  33%|###3      | 1/3 [00:16<00:16,  8.32s/it]
       4/4        0G      0.11   0.01649   0.07595        39       320:  67%|######6   | 2/3 [00:16<00:08,  8.18s/it]
       4/4        0G     0.108   0.01827   0.07701        21       320:  67%|######6   | 2/3 [00:20<00:08,  8.18s/it]
       4/4        0G     0.108   0.01827   0.07701        21       320: 100%|##########| 3/3 [00:20<00:00,  6.38s/it]
       4/4        0G     0.108   0.01827   0.07701        21       320: 100%|##########| 3/3 [00:20<00:00,  6.88s/it]

               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:   0%|          | 0/2 [00:00<?, ?it/s]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:  50%|#####     | 1/2 [00:05<00:05,  5.78s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:07<00:00,  3.28s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:07<00:00,  3.66s/it]

5 epochs completed in 0.042 hours.

Validating runs\train\exp11\weights\best.pt...
Fusing layers...
Model Summary: 213 layers, 7055974 parameters, 0 gradients, 15.9 GFLOPs

               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:   0%|          | 0/2 [00:00<?, ?it/s]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95:  50%|#####     | 1/2 [00:05<00:05,  5.50s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:07<00:00,  3.22s/it]
               Class     Images     Labels          P          R     mAP@.5 mAP@.5:.95: 100%|##########| 2/2 [00:07<00:00,  3.56s/it]
Results saved to runs\train\exp11
```

In [26]:
```python
model = torch.hub.load('ultralytics/yolov5', 'custom', path='yolov5/runs/train/exp11/weights/last.pt', force_reload=True)
```

```
Downloading: "https://github.com/ultralytics/yolov5/archive/master.zip" to C:\Users\hp/.cache\torch\hub\master.zip
YOLOv5  2021-10-18 torch 1.8.2+cu102 CPU

Fusing layers...
Model Summary: 213 layers, 7055974 parameters, 0 gradients, 15.9 GFLOPs
Adding AutoShape...
```

In [32]:
```python
cap = cv2.VideoCapture(0)
while cap.isOpened():
    ret, frame = cap.read()

    # Make detections
    results = model(frame)

    cv2.imshow('YOLO', np.squeeze(results.render()))

    if cv2.waitKey(10) & 0xFF == ord('q'):
        break
cap.release()
cv2.destroyAllWindows()
```

In [ ]:
```
```