

Object Detection with YOLO

1) For Q1 i will do data augmentation (targeted brightening etc) for my dataset i used to improve model performance in detecting 'books' as model detects laptops class good enough but will improve it also

2) For 10 epochs i got following metrics, see results more clearly in runs/detect dir check train5, train52

```
10 epochs completed in 0.352 hours.
Optimizer stripped from runs/detect/train5/weights/last.pt, 6.2MB
Optimizer stripped from runs/detect/train5/weights/best.pt, 6.2MB

Validating runs/detect/train5/weights/best.pt...
Ultralytics 8.3.17 Python-3.10.12 torch-2.2.2+cu121 CPU (12th Gen Intel Core(TM) i7-1255U)
Model summary (fused): 168 layers, 3,006,038 parameters, 0 gradients, 8.1 GFLOPs

```

Class	Images	Instances	Box(P)	R	mAP50	mAP50-95)
all	40	122	0.693	0.464	0.516	0.319
Laptop	20	28	0.664	0.714	0.724	0.438
Book	20	94	0.722	0.213	0.307	0.2

```
Speed: 1.8ms preprocess, 184.4ms inference, 0.0ms loss, 39.6ms postprocess per image
Results saved to runs/detect/train5
```

```
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Ultralytics 8.3.17 Python-3.10.12 torch-2.2.2+cu121 CPU (12th Gen Intel Core(TM) i7-1255U)
Model summary (fused): 168 layers, 3,006,038 parameters, 0 gradients, 8.1 GFLOPs
val: Scanning /home/ubuntu/Documents/The Humanoid Project/open-images-dataset/val/labels.cache... 40 images, 0 backgrounds, 0 corrupt: 100%| 40/40 [00:00<7, 7it/s]

```

Class	Images	Instances	Box(P)	R	mAP50	mAP50-95)
all	40	122	0.729	0.491	0.528	0.326
Laptop	20	28	0.697	0.738	0.763	0.464
Book	20	94	0.762	0.245	0.292	0.187

```
Speed: 1.6ms preprocess, 187.6ms inference, 0.0ms loss, 29.7ms postprocess per image
Results saved to runs/detect/train52
```

3) For 50 epochs i got following metrics , see results more clearly in runs/detect dir check train7, train72

Note: I have used get_dataset.py to get the dataset i used here(open-images-dataset) from open-images-v7 and split_dataset.py i used to split dataset into train(160) and val(40)