

```
!git clone https://github.com/ultralytics/yolov5 # clone
%cd yolov5
!pip install -r requirements.txt # install
%cd ..
```

Cloning into 'yolov5'...

remote: Enumerating objects: 13180, done.

remote: Counting objects: 100% (24/24), done.

remote: Compressing objects: 100% (19/19), done.

remote: Total 13180 (delta 7), reused 14 (delta 5), pack-reused 13156

Receiving objects: 100% (13180/13180), 12.02 MiB | 23.31 MiB/s, done.

Resolving deltas: 100% (9153/9153), done.

/content/yolov5

Requirement already satisfied: matplotlib>=3.2.2 in /usr/local/lib/python3.7/dist-

Requirement already satisfied: numpy>=1.18.5 in /usr/local/lib/python3.7/dist-pack

Requirement already satisfied: opencv-python>=4.1.1 in /usr/local/lib/python3.7/di

Requirement already satisfied: Pillow>=7.1.2 in /usr/local/lib/python3.7/dist-pack

Collecting PyYAML>=5.3.1

Downloading PyYAML-6.0-cp37-cp37m-manylinux\_2\_5\_x86\_64.manylinux1\_x86\_64.manylin

| 596 kB 5.3 MB/s

Requirement already satisfied: requests>=2.23.0 in /usr/local/lib/python3.7/dist-p

Requirement already satisfied: scipy>=1.4.1 in /usr/local/lib/python3.7/dist-packa

Requirement already satisfied: torch>=1.7.0 in /usr/local/lib/python3.7/dist-packa

Requirement already satisfied: torchvision>=0.8.1 in /usr/local/lib/python3.7/dist

Requirement already satisfied: tqdm>=4.41.0 in /usr/local/lib/python3.7/dist-packa

Requirement already satisfied: tensorboard>=2.4.1 in /usr/local/lib/python3.7/dist

Requirement already satisfied: pandas>=1.1.4 in /usr/local/lib/python3.7/dist-pack

Requirement already satisfied: seaborn>=0.11.0 in /usr/local/lib/python3.7/dist-pa

Collecting thop

Downloading thop-0.0.31.post2005241907-py3-none-any.whl (8.7 kB)

Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.1 in /usr/lo

Requirement already satisfied: python-dateutil>=2.1 in /usr/local/lib/python3.7/di

Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.7/dist-

Requirement already satisfied: cyclers>=0.10 in /usr/local/lib/python3.7/dist-packa

Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.7/dist-packa

Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.7/dist

Requirement already satisfied: urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 in /usr/loc

Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.7/dist-

Requirement already satisfied: typing-extensions in /usr/local/lib/python3.7/dist-

Requirement already satisfied: google-auth<3,>=1.6.3 in /usr/local/lib/python3.7/d

Requirement already satisfied: tensorboard-plugin-wit>=1.6.0 in /usr/local/lib/pyt

Requirement already satisfied: setuptools>=41.0.0 in /usr/local/lib/python3.7/dist

Requirement already satisfied: markdown>=2.6.8 in /usr/local/lib/python3.7/dist-pa

Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in /usr/local/lib/

Requirement already satisfied: tensorboard-data-server<0.7.0,>=0.6.0 in /usr/local

Requirement already satisfied: protobuf>=3.6.0 in /usr/local/lib/python3.7/dist-pa

Requirement already satisfied: absl-py>=0.4 in /usr/local/lib/python3.7/dist-packa

Requirement already satisfied: grpcio>=1.24.3 in /usr/local/lib/python3.7/dist-pac

Requirement already satisfied: werkzeug>=0.11.15 in /usr/local/lib/python3.7/dist-

Requirement already satisfied: wheel>=0.26 in /usr/local/lib/python3.7/dist-packag

Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.7/dist-packa

Requirement already satisfied: six in /usr/local/lib/python3.7/dist-packages (from

Requirement already satisfied: cachetools<5.0,>=2.0.0 in /usr/local/lib/python3.7/c

Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.7/d

Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.7/dist-pack

Requirement already satisfied: requests-oauthlib>=0.7.0 in /usr/local/lib/python3.

Requirement already satisfied: importlib-metadata>=4.4 in /usr/local/lib/python3.7,

Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.7/dist-packages

```
Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: oauthlib>=3.0.0 in /usr/local/lib/python3.7/dist-packages
Installing collected packages: thop, PyYAML
Attempting uninstall: PyYAML
```

```
!pip install wandb
```

```
Collecting wandb
  Downloading wandb-0.12.16-py2.py3-none-any.whl (1.8 MB)
    |████████████████████████████████████████| 1.8 MB 5.3 MB/s
Collecting shortuuid>=0.5.0
  Downloading shortuuid-1.0.8-py3-none-any.whl (9.5 kB)
Collecting sentry-sdk>=1.0.0
  Downloading sentry_sdk-1.5.11-py2.py3-none-any.whl (144 kB)
    |████████████████████████████████████████| 144 kB 42.8 MB/s
Requirement already satisfied: protobuf>=3.12.0 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: requests<3,>=2.0.0 in /usr/local/lib/python3.7/dist-packages
Collecting docker-pycreds>=0.4.0
  Downloading docker_pycreds-0.4.0-py2.py3-none-any.whl (9.0 kB)
Collecting setproctitle
  Downloading setproctitle-1.2.3-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux2014_x86_64.whl (27 kB)
Collecting GitPython>=1.0.0
  Downloading GitPython-3.1.27-py3-none-any.whl (181 kB)
    |████████████████████████████████████████| 181 kB 43.9 MB/s
Requirement already satisfied: python-dateutil>=2.6.1 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: psutil>=5.0.0 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: setuptools in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: Click!=8.0.0,>=7.0 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: PyYAML in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: six>=1.13.0 in /usr/local/lib/python3.7/dist-packages
Collecting pathtools
  Downloading pathtools-0.1.2.tar.gz (11 kB)
Requirement already satisfied: promise<3,>=2.0 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: typing-extensions>=3.7.4.3 in /usr/local/lib/python3.7/dist-packages
Collecting gitdb<5,>=4.0.1
  Downloading gitdb-4.0.9-py3-none-any.whl (63 kB)
    |████████████████████████████████████████| 63 kB 1.6 MB/s
Collecting smmap<6,>=3.0.1
  Downloading smmap-5.0.0-py3-none-any.whl (24 kB)
Requirement already satisfied: urllib3!=1.25.0,!1.25.1,<1.26,>=1.21.1 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.7/dist-packages
Building wheels for collected packages: pathtools
  Building wheel for pathtools (setup.py) ... done
  Created wheel for pathtools: filename=pathtools-0.1.2-py3-none-any.whl size=8806 sha256=8806
  Stored in directory: /root/.cache/pip/wheels/3e/31/09/fa59cef12cdcfecc627b3d2427369
Successfully built pathtools
Installing collected packages: smmap, gitdb, shortuuid, setproctitle, sentry-sdk, pathtools
Successfully installed GitPython-3.1.27 docker-pycreds-0.4.0 gitdb-4.0.9 pathtools-0.1.2 sentry-sdk-1.5.11 shortuuid-1.0.8 setproctitle-1.2.3 smmap-5.0.0 wandb-0.12.16
```

```
!wget -P datasets/ "https://ultralytics.com/assets/coco128.zip"
```

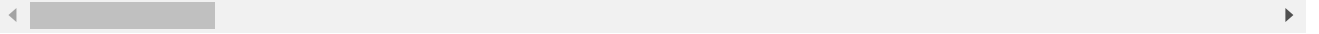
```
import zipfile
```

```
with zipfile.ZipFile("datasets/coco128.zip", "r") as zip:
    zip.extractall("datasets/")
```

```
--2022-05-05 06:59:15-- https://ultralytics.com/assets/coco128.zip
Resolving ultralytics.com (ultralytics.com)... 151.101.1.195, 151.101.65.195
Connecting to ultralytics.com (ultralytics.com)|151.101.1.195|:443... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://github.com/ultralytics/yolov5/releases/download/v1.0/coco128.zip [1
--2022-05-05 06:59:15-- https://github.com/ultralytics/yolov5/releases/download/v1.0
Resolving github.com (github.com)... 140.82.113.4
Connecting to github.com (github.com)|140.82.113.4|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65f
--2022-05-05 06:59:15-- https://objects.githubusercontent.com/github-production-rel
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.110.133
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.110.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 6984509 (6.7M) [application/octet-stream]
Saving to: 'datasets/coco128.zip'
```

```
coco128.zip          100%[=====>]    6.66M  --.-KB/s    in 0.08s
```

```
2022-05-05 06:59:16 (84.4 MB/s) - 'datasets/coco128.zip' saved [6984509/6984509]
```



```
!wget -P yolov5/weights/ "https://github.com/ultralytics/yolov5/releases/download/v6.1/yolov5-weights.tar.gz"
!python yolov5/train.py --img 640 --batch 16 --epochs 100 --data coco128.yaml --weights yolov5-weights.tar.gz
```

class	128	10	0.721	1	0.905	0.9
cup	128	36	0.884	0.972	0.974	0.9
fork	128	6	0.905	0.833	0.972	0.9
knife	128	16	0.894	0.812	0.94	0.9
spoon	128	22	0.777	0.955	0.973	0.9
bowl	128	28	0.813	0.893	0.902	0.9
banana	128	1	0.758	1	0.995	0.9
sandwich	128	2	0.664	1	0.995	0.9
orange	128	4	0.892	1	0.995	0.9
broccoli	128	11	0.866	1	0.995	0.9
carrot	128	24	0.774	1	0.989	0.9
hot dog	128	2	0.823	1	0.995	0.9
pizza	128	5	0.935	1	0.995	0.9
donut	128	14	0.965	1	0.995	0.9
cake	128	4	0.845	1	0.995	0.9
chair	128	35	0.917	0.953	0.99	0.9
couch	128	6	0.824	1	0.995	0.9
potted plant	128	14	0.961	1	0.995	0.9
bed	128	3	0.873	1	0.995	0.9
dining table	128	13	1	0.991	0.995	0.9
toilet	128	2	0.828	1	0.995	0.9
tv	128	2	0.818	1	0.995	0.9
laptop	128	3	0.897	1	0.995	0.9
mouse	128	2	0.856	1	0.995	0.9
remote	128	8	0.868	1	0.995	0.9
cell phone	128	8	0.962	1	0.995	0.9
microwave	128	3	0.872	1	0.995	0.9
oven	128	5	0.92	1	0.995	0.9
sink	128	6	0.798	0.833	0.883	0.9
refrigerator	128	5	0.918	1	0.995	0.9
book	128	29	0.854	0.862	0.941	0.9
clock	128	9	0.947	1	0.995	0.9
vase	128	2	0.825	1	0.995	0.9
scissors	128	1	0.807	1	0.995	0.9

	128	1	0.997	1	0.995	0.0
teddy bear	128	21	0.966	1	0.995	0.
toothbrush	128	5	0.838	1	0.995	0.

wandb: Waiting for W&B process to finish... (success).

wandb:

wandb:

wandb: Run history:

wandb: metrics/mAP\_0.5

wandb: metrics/mAP\_0.5:0.95

wandb: metrics/precision

wandb: metrics/recall

wandb: train/box\_loss

wandb: train/cls\_loss

wandb: train/obj\_loss

wandb: val/box\_loss

wandb: val/cls\_loss

wandb: val/obj\_loss

wandb: x/lr0

wandb: x/lr1

wandb: x/lr2

wandb:

wandb: Run summary:

wandb: best/epoch 99

wandb: best/mAP\_0.5 0.96448

wandb: best/mAP\_0.5:0.95 0.77108

```
!wget -P yolov5/weights/ "https://github.com/ultralytics/yolov5/releases/download/v6.1/yol
!python yolov5/train.py --img 640 --batch 16 --epochs 100 --data coco128.yaml --weights yo
```

	128	3	0.837	1	0.995	0
bed	128	3	0.837	1	0.995	0
dining table	128	13	0.852	1	0.984	(
toilet	128	2	0.848	1	0.995	0
tv	128	2	0.841	1	0.995	0
laptop	128	3	0.695	0.667	0.863	0
mouse	128	2	0.872	1	0.995	0
remote	128	8	0.966	1	0.995	0
cell phone	128	8	0.915	1	0.995	(
microwave	128	3	0.885	1	0.995	0
oven	128	5	0.926	1	0.995	0
sink	128	6	0.793	0.833	0.942	0
refrigerator	128	5	0.921	1	0.995	(
book	128	29	0.961	0.851	0.948	0
clock	128	9	0.946	1	0.995	0
vase	128	2	0.843	1	0.995	0
scissors	128	1	0.999	1	0.995	0
teddy bear	128	21	0.975	1	0.995	0
toothbrush	128	5	0.915	1	0.995	0

wandb: Waiting for W&B process to finish... (success).

wandb:

wandb:

wandb: Run history:

wandb: metrics/mAP\_0.5

wandb: metrics/mAP\_0.5:0.95

wandb: metrics/precision

wandb: metrics/recall

wandb: train/box\_loss

wandb: train/cls\_loss

wandb: train/obj\_loss

wandb: val/box\_loss

wandb: val/cls loss

```

wandb:      val/obj_loss
wandb:      x/lr0
wandb:      x/lr1
wandb:      x/lr2
wandb:
wandb: Run summary:
wandb:      best/epoch 99
wandb:      best/mAP_0.5 0.97082
wandb:      best/mAP_0.5:0.95 0.85076
wandb:      best/precision 0.90477
wandb:      best/recall 0.95841
wandb:      metrics/mAP_0.5 0.97083
wandb:      metrics/mAP_0.5:0.95 0.85042
wandb:      metrics/precision 0.90475
wandb:      metrics/recall 0.95842
wandb:      train/box_loss 0.0221
wandb:      train/cls_loss 0.00427
wandb:      train/obj_loss 0.02686
wandb:      val/box_loss 0.01836
wandb:      val/cls_loss 0.0022
wandb:      val/obj_loss 0.01428
wandb:      x/lr0 0.0003
wandb:      x/lr1 0.0003
wandb:      x/lr2 0.0003
wandb:
wandb: Synced galactic-nerf-herder-19: https://wandb.ai/fortunatespy/train/runs/16

```

```

!wget -P yolov5/weights/ "https://github.com/ultralytics/yolov5/releases/download/v6.1/yol
!python yolov5/train.py --img 640 --batch 16 --epochs 100 --data coco128.yaml --weights yo

```

potted plant	128	14	0.957	1	0.995	0
bed	128	3	0.906	1	0.995	0
dining table	128	13	1	0.973	0.995	0
toilet	128	2	0.885	1	0.995	0
tv	128	2	0.879	1	0.995	0
laptop	128	3	0.805	0.667	0.676	0
mouse	128	2	0.895	1	0.995	0
remote	128	8	0.993	1	0.995	0
cell phone	128	8	0.962	1	0.995	0
microwave	128	3	0.912	1	0.995	0
oven	128	5	0.942	1	0.995	0
sink	128	6	1	0.973	0.995	0
refrigerator	128	5	0.941	1	0.995	0
book	128	29	0.933	0.862	0.951	0
clock	128	9	0.973	1	0.995	0
vase	128	2	0.882	1	0.995	0
scissors	128	1	0.841	1	0.995	0
teddy bear	128	21	0.979	1	0.995	0
toothbrush	128	5	0.915	1	0.995	0

```
wandb: Waiting for W&B process to finish... (success).
```

```
wandb:
```

```
wandb:
```

```
wandb: Run history:
```

```

wandb:      metrics/mAP_0.5
wandb:      metrics/mAP_0.5:0.95
wandb:      metrics/precision
wandb:      metrics/recall
wandb:      train/box_loss
wandb:      train/cls loss

```

```

wandb:      train/obj_loss
wandb:      val/box_loss
wandb:      val/cls_loss
wandb:      val/obj_loss
wandb:      x/lr0
wandb:      x/lr1
wandb:      x/lr2
wandb:
wandb: Run summary:
wandb:      best/epoch 99
wandb:      best/mAP_0.5 0.97496
wandb:      best/mAP_0.5:0.95 0.87612
wandb:      best/precision 0.94187
wandb:      best/recall 0.95522
wandb:      metrics/mAP_0.5 0.97496
wandb:      metrics/mAP_0.5:0.95 0.87603
wandb:      metrics/precision 0.94211
wandb:      metrics/recall 0.95496
wandb:      train/box_loss 0.01948
wandb:      train/cls_loss 0.00333
wandb:      train/obj_loss 0.02407
wandb:      val/box_loss 0.01598
wandb:      val/cls_loss 0.00205
wandb:      val/obj_loss 0.01255
wandb:      x/lr0 0.0003
wandb:      x/lr1 0.0003
wandb:      x/lr2 0.0003
wandb:
wandb: Synced elegant-trooper-20: https://wandb.ai/fortunatespv/train/runs/1fazb3v

```

```

!wget -P yolov5/weights/ "https://github.com/ultralytics/yolov5/releases/download/v6.1/yol
!python yolov5/train.py --img 640 --batch 8 --epochs 100 --data coco128.yaml --weights yol

```

bed	128	3	0.92	1	0.995	0
dining table	128	13	1	0.826	0.99	0
toilet	128	2	0.887	1	0.995	0
tv	128	2	0.88	1	0.995	0
laptop	128	3	0.841	0.667	0.717	0
mouse	128	2	0.907	1	0.995	0
remote	128	8	0.982	1	0.995	0
cell phone	128	8	0.969	1	0.995	0
microwave	128	3	0.913	1	0.995	0
oven	128	5	0.945	1	0.995	0
sink	128	6	0.913	0.833	0.864	0
refrigerator	128	5	0.941	1	0.995	0
book	128	29	1	0.795	0.982	0
clock	128	9	0.964	1	0.995	0
vase	128	2	0.884	1	0.995	0
scissors	128	1	0.993	1	0.995	0
teddy bear	128	21	0.984	1	0.995	0
toothbrush	128	5	0.938	1	0.995	0

```

wandb: Waiting for W&B process to finish... (success).
wandb:
wandb:
wandb: Run history:
wandb:      metrics/mAP_0.5
wandb:      metrics/mAP_0.5:0.95
wandb:      metrics/precision
wandb:      metrics/recall

```

```
wandb: train/box_loss
wandb: train/cls_loss
wandb: train/obj_loss
wandb: val/box_loss
wandb: val/cls_loss
wandb: val/obj_loss
wandb: x/lr0
wandb: x/lr1
wandb: x/lr2
wandb:
wandb: Run summary:
wandb: best/epoch 99
wandb: best/mAP_0.5 0.9744
wandb: best/mAP_0.5:0.95 0.87469
wandb: best/precision 0.94713
wandb: best/recall 0.94965
wandb: metrics/mAP_0.5 0.97442
wandb: metrics/mAP_0.5:0.95 0.8745
wandb: metrics/precision 0.94657
wandb: metrics/recall 0.94968
wandb: train/box_loss 0.02055
wandb: train/cls_loss 0.00395
wandb: train/obj_loss 0.02458
wandb: val/box_loss 0.01589
wandb: val/cls_loss 0.00215
wandb: val/obj_loss 0.01373
wandb: x/lr0 0.0003
wandb: x/lr1 0.0003
wandb: x/lr2 0.0003
wandb:
wandb: Synced tusken-podracers-21: https://wandb.ai/fortunatespy/train/runs/yyiozjl
```

