


```
!pip install roboflow
```

 [Show hidden output](#)

```
import os
import torch
```

```
if torch.cuda.is_available():
    print("CUDA is available! 🦄")
    print(f"CUDA version: {torch.version.cuda}")
    print(f"Number of GPUs: {torch.cuda.device_count()}")
else:
    print("CUDA is not available. 😞")
```

```
!nvidia-smi
```

 CUDA is available! 🦄  
 CUDA version: 12.1  
 Number of GPUs: 1  
 Mon Jan 27 20:06:30 2025

+-----+ Driver Version: 535.104.05 CUDA Version: 12.2 +-----+									
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+									
GPU Name			Persistence-M	Bus-Id	Disp.A	Volatile Uncorr. ECC			
Fan	Temp	Perf	Pwr:Usage/Cap		Memory-Usage	GPU-Util	Compute M.		
=====									
0	Tesla T4		Off	00000000:00:04.0	Off		0		
N/A	47C	P8	11W / 70W		3MiB / 15360MiB	0%	Default		
							N/A		
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+									
+-----+ Processes: +-----+									
GPU	GI	CI	PID	Type	Process name	GPU Memory			
	ID	ID				Usage			
=====									
No running processes found									
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+									

You need to select a GPU on runtime in order to import CUDA.

CUDA allows you to run code on the GPU's.

Clone the YOLOv7 repository and install dependencies

```
# Download YOLOv7 repository and install requirements
if not os.path.isdir("yolov7"):
    !git clone https://github.com/WongKinYiu/yolov7
%cd yolov7
!pip install -r requirements.txt
```

```

/content/yolov7
Requirement already satisfied: matplotlib>=3.2.2 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 4)) (3.7.1)
Collecting numpy<1.24.0,>=1.18.5 (from -r requirements.txt (line 5))
  Downloading numpy-1.23.5-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (2.3 kB)
Requirement already satisfied: opencv-python>=4.1.1 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 6)) (4.8.1.70)
Requirement already satisfied: Pillow>=7.1.2 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 7)) (10.4.0)
Requirement already satisfied: PyYAML>=5.3.1 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 8)) (6.0.1)
Requirement already satisfied: requests>=2.23.0 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 9)) (2.31.0)
Requirement already satisfied: scipy>=1.4.1 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 10)) (1.11.0)
Requirement already satisfied: torch!=1.12.0,>=1.7.0 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 11)) (2.0.1)
Requirement already satisfied: torchvision!=0.13.0,>=0.8.1 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 12)) (0.15.2)
Requirement already satisfied: tqdm>=4.41.0 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 13)) (4.66.0)
Collecting protobuf<4.21.3 (from -r requirements.txt (line 14))
  Downloading protobuf-4.21.2-cp37-abi3-manylinux2014_x86_64.whl.metadata (540 bytes)
Requirement already satisfied: tensorboard>=2.4.1 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 17)) (2.14.0)
Requirement already satisfied: pandas>=1.1.4 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 21)) (2.2.0)
Requirement already satisfied: seaborn>=0.11.0 in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 22)) (0.12.2)
Requirement already satisfied: ipython in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 34)) (7.34.0)
Requirement already satisfied: psutil in /usr/local/lib/python3.11/dist-packages (from -r requirements.txt (line 35)) (5.9.5)
Collecting thop (from -r requirements.txt (line 36))
  Downloading thop-0.1.1.post2209072238-py3-none-any.whl.metadata (2.7 kB)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.2.2->-r requirements.txt (line 4)) (1.1.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.2.2->-r requirements.txt (line 4)) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.2.2->-r requirements.txt (line 4)) (4.22.0)
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.2.2->-r requirements.txt (line 4)) (1.4.5)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.2.2->-r requirements.txt (line 4)) (23.1)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.2.2->-r requirements.txt (line 4)) (3.1.2)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.11/dist-packages (from matplotlib>=3.2.2->-r requirements.txt (line 4)) (2.8.2)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests>=2.23.0->-r requirements.txt (line 9)) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests>=2.23.0->-r requirements.txt (line 9)) (3.6)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests>=2.23.0->-r requirements.txt (line 9)) (2.2.1)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests>=2.23.0->-r requirements.txt (line 9)) (2024.7.4)
Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (3.13.1)
Requirement already satisfied: typing-extensions>=4.8.0 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (4.9.0)
Requirement already satisfied: networkx in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (3.2.1)
Requirement already satisfied: Jinja2 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (3.1.3)
Requirement already satisfied: fsspec in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (2024.9.0)
Requirement already satisfied: nvidia-cuda-nvrtc-cu12==12.1.105 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (12.1.105)
Requirement already satisfied: nvidia-cuda-runtime-cu12==12.1.105 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (12.1.105)
Requirement already satisfied: nvidia-cuda-cupti-cu12==12.1.105 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (12.1.105)
Requirement already satisfied: nvidia-cudnn-cu12==9.1.0.70 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (9.1.0.70)
Requirement already satisfied: nvidia-cublas-cu12==12.1.3.1 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (12.1.3.1)
Requirement already satisfied: nvidia-cufft-cu12==11.0.2.54 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (11.0.2.54)
Requirement already satisfied: nvidia-curand-cu12==10.3.2.106 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (10.3.2.106)
Requirement already satisfied: nvidia-cusolver-cu12==11.4.5.107 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (11.4.5.107)
Requirement already satisfied: nvidia-cusparse-cu12==12.1.0.106 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (12.1.0.106)
Requirement already satisfied: nvidia-nccl-cu12==2.21.5 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (2.21.5)
Requirement already satisfied: nvidia-nvtx-cu12==12.1.105 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (12.1.105)
Requirement already satisfied: triton==3.1.0 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (3.1.0)
Requirement already satisfied: sympy==1.13.1 in /usr/local/lib/python3.11/dist-packages (from torch!=1.12.0,>=1.7.0->-r requirements.txt (line 11)) (1.13.1)
Requirement already satisfied: nvidia-nvjitlink-cu12 in /usr/local/lib/python3.11/dist-packages (from nvidia-cusolver-cu12==11.4.5.107->-r requirements.txt (line 11)) (2.3.0)
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.11/dist-packages (from sympy==1.13.1->-r requirements.txt (line 11)) (1.3.0)
Requirement already satisfied: absl-py>=0.4 in /usr/local/lib/python3.11/dist-packages (from tensorboard>=2.4.1->-r requirements.txt (line 17)) (0.15.1)
Requirement already satisfied: grpcio>=1.48.2 in /usr/local/lib/python3.11/dist-packages (from tensorboard>=2.4.1->-r requirements.txt (line 17)) (1.64.0)
Requirement already satisfied: markdown>=2.6.8 in /usr/local/lib/python3.11/dist-packages (from tensorboard>=2.4.1->-r requirements.txt (line 17)) (3.5.2)
Requirement already satisfied: setuptools>=41.0.0 in /usr/local/lib/python3.11/dist-packages (from tensorboard>=2.4.1->-r requirements.txt (line 17)) (69.5.1)
Requirement already satisfied: six>1.9 in /usr/local/lib/python3.11/dist-packages (from tensorboard>=2.4.1->-r requirements.txt (line 17)) (1.16.0)
Requirement already satisfied: tensorboard-data-server<0.8.0,>=0.7.0 in /usr/local/lib/python3.11/dist-packages (from tensorboard>=2.4.1->-r requirements.txt (line 17)) (0.7.0)
Requirement already satisfied: werkzeug>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from tensorboard>=2.4.1->-r requirements.txt (line 17)) (3.0.6)
Requirement already satisfied: pytz>=2020.1 in /usr/local/lib/python3.11/dist-packages (from pandas>=1.1.4->-r requirements.txt (line 21)) (2024.1)
Requirement already satisfied: tzdata>=2022.7 in /usr/local/lib/python3.11/dist-packages (from pandas>=1.1.4->-r requirements.txt (line 21)) (2024.1)
Collecting jedi>=0.16 (from ipython->-r requirements.txt (line 34))
  Downloading jedi-0.19.2-py2.py3-none-any.whl.metadata (22 kB)
Requirement already satisfied: decorator in /usr/local/lib/python3.11/dist-packages (from ipython->-r requirements.txt (line 34)) (5.1.1)
Requirement already satisfied: pickleshare in /usr/local/lib/python3.11/dist-packages (from ipython->-r requirements.txt (line 34)) (0.7.5)
Requirement already satisfied: traitlets>=4.2 in /usr/local/lib/python3.11/dist-packages (from ipython->-r requirements.txt (line 34)) (4.2.0)
Requirement already satisfied: prompt-toolkit!=3.0.0,!>=3.0.1,<3.1.0,>=2.0.0 in /usr/local/lib/python3.11/dist-packages (from ipython->-r requirements.txt (line 34)) (3.0.42)
Requirement already satisfied: pygments in /usr/local/lib/python3.11/dist-packages (from ipython->-r requirements.txt (line 34)) (2.18.0)
Requirement already satisfied: backcall in /usr/local/lib/python3.11/dist-packages (from ipython->-r requirements.txt (line 34)) (0.2.0)
Requirement already satisfied: matplotlib-inline in /usr/local/lib/python3.11/dist-packages (from ipython->-r requirements.txt (line 34)) (0.16.2)
Requirement already satisfied: pexpect>4.3 in /usr/local/lib/python3.11/dist-packages (from ipython->-r requirements.txt (line 34)) (4.9.0)
Requirement already satisfied: parso<0.9.0,>=0.8.4 in /usr/local/lib/python3.11/dist-packages (from jedi>=0.16->-r requirements.txt (line 34)) (0.8.4)
Requirement already satisfied: ptyprocess>=0.5 in /usr/local/lib/python3.11/dist-packages (from pexpect>4.3->-r requirements.txt (line 34)) (0.7.0)
Requirement already satisfied: wcwidth in /usr/local/lib/python3.11/dist-packages (from prompt-toolkit!=3.0.0,!>=3.0.1,<3.1.0,>=2.0.0->-r requirements.txt (line 34)) (0.2.13)
Requirement already satisfied: MarkupSafe>=2.1.1 in /usr/local/lib/python3.11/dist-packages (from werkzeug>=1.0.1->-r requirements.txt (line 17)) (2.1.5)
Downloaded numpy-1.23.5-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (17.1 MB)
17.1/17.1 MB 76.2 MB/s eta 0:00:00
Downloaded protobuf-4.21.2-cp37-abi3-manylinux2014_x86_64.whl (407 kB)
407.8/407.8 kB 33.2 MB/s eta 0:00:00
Downloaded thop-0.1.1.post2209072238-py3-none-any.whl (15 kB)
Downloaded jedi-0.19.2-py2.py3-none-any.whl (1.6 MB)
1.6/1.6 MB 61.0 MB/s eta 0:00:00
Installing collected packages: protobuf, numpy, jedi, thop
  Attempting uninstall: protobuf
    Found existing installation: protobuf 4.25.5
    Uninstalling protobuf-4.25.5:
      Successfully uninstalled protobuf-4.25.5
  Attempting uninstall: numpy
    Found existing installation: numpy 1.26.4
    Uninstalling numpy-1.26.4:
```

Successfully uninstalled numpy-1.26.4

```
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the
google-cloud-pubsub 2.25.0 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
google-cloud-bigtable 2.28.1 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
google-cloud-aiplatform 1.74.0 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
google-cloud-bigquery-connection 1.17.0 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
chex 0.1.88 requires numpy>=1.24.1, but you have numpy 1.23.5 which is incompatible.
google-cloud-resource-manager 1.14.0 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
google-cloud-bigquery-storage 2.27.0 requires protobuf!=3.20.0,!3.20.1,!4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
tensorflow-metadata 1.16.1 requires protobuf<6.0.0dev,>=4.25.2; python_version >= "3.11", but you have protobuf 4.21.2 which is incompatible.
pymc 5.19.1 requires numpy>=1.25.0, but you have numpy 1.23.5 which is incompatible.
google-cloud-translate 3.19.0 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
xarray 2025.1.1 requires numpy>=1.24, but you have numpy 1.23.5 which is incompatible.
google-cloud-firestore 2.19.0 requires protobuf!=3.20.0,!3.20.1,!4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
google-cloud-functions 1.19.0 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
jax 0.4.33 requires numpy>=1.24, but you have numpy 1.23.5 which is incompatible.
bigframes 1.33.0 requires numpy>=1.24.0, but you have numpy 1.23.5 which is incompatible.
scikit-image 0.25.0 requires numpy>=1.24, but you have numpy 1.23.5 which is incompatible.
googleapis-common-protos 1.66.0 requires protobuf!=3.20.0,!3.20.1,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
grpcio-status 1.62.3 requires protobuf>=4.21.6, but you have protobuf 4.21.2 which is incompatible.
google-cloud-language 2.16.0 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
imbalanced-learn 0.13.0 requires numpy<3,>=1.24.3, but you have numpy 1.23.5 which is incompatible.
google-ai-generativelanguage 0.6.15 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
albucore 0.0.19 requires numpy>=1.24.4, but you have numpy 1.23.5 which is incompatible.
albumintations 1.4.20 requires numpy>=1.24.4, but you have numpy 1.23.5 which is incompatible.
blosc2 3.0.0 requires numpy>=1.25.0, but you have numpy 1.23.5 which is incompatible.
google-cloud-iam 2.17.0 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
jaxlib 0.4.33 requires numpy>=1.24, but you have numpy 1.23.5 which is incompatible.
google-cloud-datastore 2.20.2 requires protobuf!=3.20.0,!3.20.1,!4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
google-api-core 2.19.2 requires protobuf!=3.20.0,!3.20.1,!4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have
tensorflow 2.17.1 requires protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<5.0.0dev,>=3.20.3, but you have protobuf 4.21.2
grpc-google-iam-v1 0.14.0 requires protobuf!=4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<6.0.0dev,>=3.20.2, but you have protobuf 4.21.2
Successfully installed jedi-0.19.2 numpy-1.23.5 protobuf-4.21.2 thop-0.1.1.post2209072238
WARNING: The following packages were previously imported in this runtime:
[numpy]
You must restart the runtime in order to use newly installed versions.
```

RESTART SESSION

## ✓ Dataset from Roboflow

Since we curated our datasets on roboflow, we can programatically import and extract the data in the right format for the YOLO model.

This model requires a custom .yaml file with information about classes and the directories for the train, validation and test datasets.

Firstly, we need get our dataset from Roboflow.

We can do that easily by clicking on the download button on our dataset on Roboflow and copy the code provided.

```
from roboflow import Roboflow
rf = Roboflow(api_key="bpTnKg4hhE850z3ox0Fg")
project = rf.workspace("endexspace").project("supermarket-items-yolov7")
version = project.version(2)
dataset = version.download("yolov7")
```

```
🔄 loading Roboflow workspace...
loading Roboflow project...
Downloading Dataset Version Zip in Supermarket-Items-(YOLOv7)-2 to yolov7pytorch:: 100%|██████████| 419317/419317 [00:06<00:00, 6386
Extracting Dataset Version Zip to Supermarket-Items-(YOLOv7)-2 in yolov7pytorch:: 100%|██████████| 8264/8264 [00:04<00:00, 1968.51it
```

## ✓ Preparing the data

Now that we have all the prerequisites done:

1. Importing and extracting the dataset,
2. Cloning the YOLOv7 model,
3. And ensuring GPU is being used.

We can now get the starting weights for the tiny model.

```
# Download the Tiny model weights.
!wget https://github.com/WongKinYiu/yolov7/releases/download/v0.1/yolov7-tiny.pt
```

```
🔄 --2025-01-27 20:08:12-- https://github.com/WongKinYiu/yolov7/releases/download/v0.1/yolov7-tiny.pt
Resolving github.com (github.com)... 140.82.113.3
Connecting to github.com (github.com)[140.82.113.3]:443... connected.
HTTP request sent, awaiting response... 302 Found
```

```

Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/511187726/ba7d01ee-125a-4134-8864-fa1abcbf94
--2025-01-27 20:08:12-- https://objects.githubusercontent.com/github-production-release-asset-2e65be/511187726/ba7d01ee-125a-4134-f
Resolving objects.githubusercontent.com (objects.githubusercontent.com)... 185.199.109.133, 185.199.111.133, 185.199.110.133, ...
Connecting to objects.githubusercontent.com (objects.githubusercontent.com)|185.199.109.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 12639769 (12M) [application/octet-stream]
Saving to: 'yolov7-tiny.pt'

yolov7-tiny.pt      100%[=====>]  12.05M  72.4MB/s   in 0.2s

2025-01-27 20:08:12 (72.4 MB/s) - 'yolov7-tiny.pt' saved [12639769/12639769]

```

We will be using the tiny YOLOv7 model so were going to create our own configuration file for our data.

Originally it had a class count of 80, we are changing that to 31

```

%%writefile yolov7/cfg/training/yolov7_grocery-tiny.yaml
# parameters
nc: 31 # number of classes
depth_multiple: 1.0 # model depth multiple
width_multiple: 1.0 # layer channel multiple

# anchors
anchors:
  - [10,13, 16,30, 33,23] # P3/8
  - [30,61, 62,45, 59,119] # P4/16
  - [116,90, 156,198, 373,326] # P5/32

# yolov7-tiny backbone
backbone:
  # [from, number, module, args] c2, k=1, s=1, p=None, g=1, act=True
  [[-1, 1, Conv, [32, 3, 2, None, 1, nn.LeakyReLU(0.1)]], # 0-P1/2

  [-1, 1, Conv, [64, 3, 2, None, 1, nn.LeakyReLU(0.1)]], # 1-P2/4

  [-1, 1, Conv, [32, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-2, 1, Conv, [32, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-1, 1, Conv, [32, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-1, 1, Conv, [32, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
  [[-1, -2, -3, -4], 1, Concat, [1]],
  [-1, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # 7

  [-1, 1, MP, []], # 8-P3/8
  [-1, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-2, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-1, 1, Conv, [64, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-1, 1, Conv, [64, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
  [[-1, -2, -3, -4], 1, Concat, [1]],
  [-1, 1, Conv, [128, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # 14

  [-1, 1, MP, []], # 15-P4/16
  [-1, 1, Conv, [128, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-2, 1, Conv, [128, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-1, 1, Conv, [128, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-1, 1, Conv, [128, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
  [[-1, -2, -3, -4], 1, Concat, [1]],
  [-1, 1, Conv, [256, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # 21

  [-1, 1, MP, []], # 22-P5/32
  [-1, 1, Conv, [256, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-2, 1, Conv, [256, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-1, 1, Conv, [256, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-1, 1, Conv, [256, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
  [[-1, -2, -3, -4], 1, Concat, [1]],
  [-1, 1, Conv, [512, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # 28
  ]

# yolov7-tiny head
head:
  [[-1, 1, Conv, [256, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-2, 1, Conv, [256, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [-1, 1, SP, [5]],
  [-2, 1, SP, [9]],
  [-3, 1, SP, [13]],
  [[-1, -2, -3, -4], 1, Concat, [1]],
  [-1, 1, Conv, [256, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
  [[-1, -7], 1, Concat, [1]],
  [-1, 1, Conv, [256, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # 37

  [-1, 1, Conv, [128, 1, 1, None, 1, nn.LeakyReLU(0.1)]],

```

```

[-1, 1, nn.Upsample, [None, 2, 'nearest']],
[21, 1, Conv, [128, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # route backbone P
[[-1, -2], 1, Concat, [1]],

[-1, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
[-2, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
[-1, 1, Conv, [64, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[-1, 1, Conv, [64, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[[-1, -2, -3, -4], 1, Concat, [1]],
[-1, 1, Conv, [128, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # 47

[-1, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
[-1, 1, nn.Upsample, [None, 2, 'nearest']],
[14, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # route backbone P3
[[-1, -2], 1, Concat, [1]],

[-1, 1, Conv, [32, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
[-2, 1, Conv, [32, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
[-1, 1, Conv, [32, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[-1, 1, Conv, [32, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[[-1, -2, -3, -4], 1, Concat, [1]],
[-1, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # 57

[-1, 1, Conv, [128, 3, 2, None, 1, nn.LeakyReLU(0.1)]],
[[-1, 47], 1, Concat, [1]],

[-1, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
[-2, 1, Conv, [64, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
[-1, 1, Conv, [64, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[-1, 1, Conv, [64, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[[-1, -2, -3, -4], 1, Concat, [1]],
[-1, 1, Conv, [128, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # 65


[-1, 1, Conv, [256, 3, 2, None, 1, nn.LeakyReLU(0.1)]],
[[-1, 37], 1, Concat, [1]],

[-1, 1, Conv, [128, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
[-2, 1, Conv, [128, 1, 1, None, 1, nn.LeakyReLU(0.1)]],
[-1, 1, Conv, [128, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[-1, 1, Conv, [128, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[[-1, -2, -3, -4], 1, Concat, [1]],
[-1, 1, Conv, [256, 1, 1, None, 1, nn.LeakyReLU(0.1)]], # 73

[57, 1, Conv, [128, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[65, 1, Conv, [256, 3, 1, None, 1, nn.LeakyReLU(0.1)]],
[73, 1, Conv, [512, 3, 1, None, 1, nn.LeakyReLU(0.1)]],

[[74,75,76], 1, IDetect, [nc, anchors]], # Detect(P3, P4, P5)
1

```

 Writing yolov7/cfg/training/yolov7\_grocery-tiny.yaml


We can now start with the training

```

dataset_location = dataset.location
loc: str = f"{dataset_location}/data.yalm"
print(loc)

!python yolov7/train.py --epochs 50 --workers 8 --device 0 --batch-size 32 \
--data {loc} --img 640 640 --cfg yolov7/cfg/training/yolov7_grocery-tiny.yaml \
--weights 'yolov7-tiny.pt' --name yolov7_tiny_grocery_fixed_res --hyp yolov7/data/hyp.scratch.tiny.yaml

```

 "/content/Supermarket-Items-(YOLOv7)-2/data.yalm"

```

2025-01-27 20:09:20.408015: E external/local_xla/xla/stream_executor/cuda/cuda_fft.cc:485] Unable to register cuFFT factory: Attempt
2025-01-27 20:09:20.429076: E external/local_xla/xla/stream_executor/cuda/cuda_dnn.cc:8454] Unable to register cuDNN factory: Attempt
2025-01-27 20:09:20.435003: E external/local_xla/xla/stream_executor/cuda/cuda_blas.cc:1452] Unable to register cuBLAS factory: Attempt
2025-01-27 20:09:20.448870: I tensorflow/core/platform/cpu_feature_guard.cc:210] This TensorFlow binary is optimized to use available CPU
To enable the following instructions: AVX2 AVX512F FMA, in other operations, rebuild TensorFlow with the appropriate compiler flags
2025-01-27 20:09:21.502822: W tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not find TensorRT
Traceback (most recent call last):

```