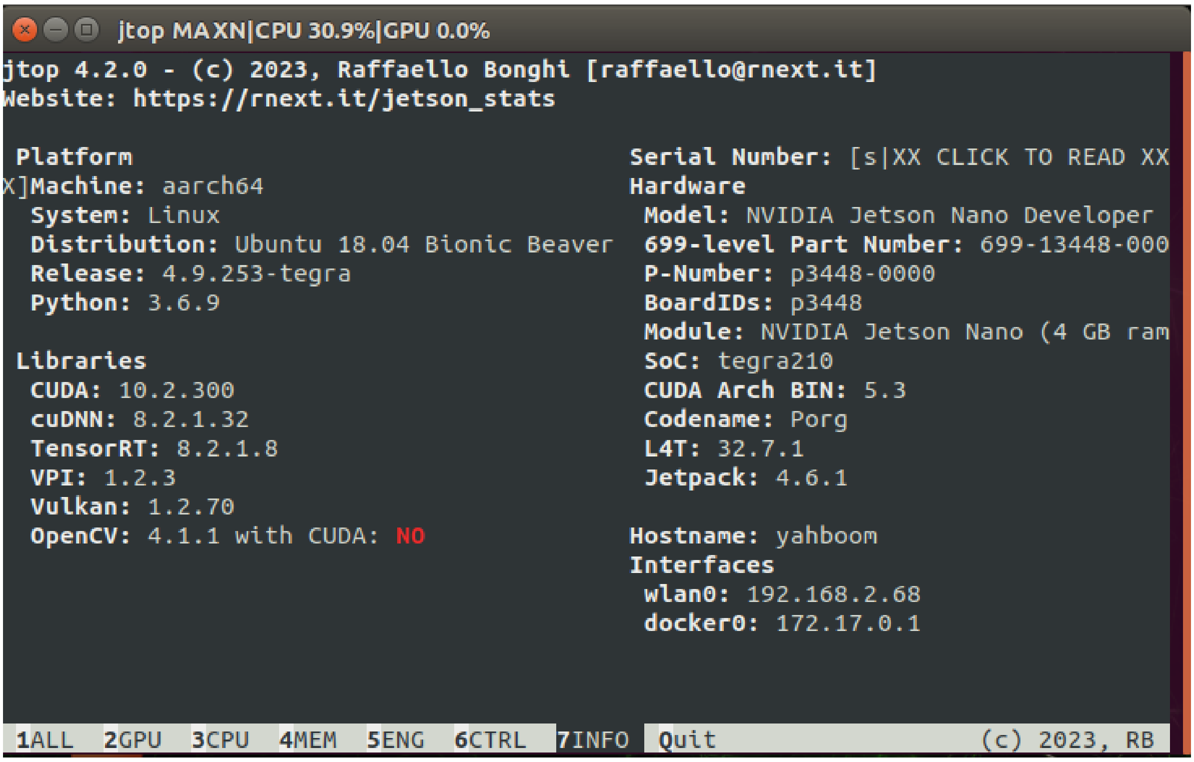
Environment construction of YOLO5

This tutorial is suitable for building the official image of Jetson Nano yourself. If you are using the YAHBOOM version of the image, this tutorial can be ignored.

1.Preparation work

One Jetson nanoThe configuration of the Jetson nano is as follows:



```
jtop 4.2.0 - (c) 2023, Raffaello Bonghi [raffaello@rnext.it]
Website: https://rnext.it/jetson_stats

 Platform                                   Serial Number: [s|XX CLICK TO READ XX
X]Machine: aarch64                          Hardware
  System: Linux                              Model: NVIDIA Jetson Nano Developer
  Distribution: Ubuntu 18.04 Bionic Beaver   699-level Part Number: 699-13448-000
  Release: 4.9.253-tegra                     P-Number: p3448-0000
  Python: 3.6.9                              BoardIDs: p3448
                                             Module: NVIDIA Jetson Nano (4 GB ram
 Libraries                                   SoC: tegra210
  CUDA: 10.2.300                             CUDA Arch BIN: 5.3
  cuDNN: 8.2.1.32                            Codename: Porg
  TensorRT: 8.2.1.8                          L4T: 32.7.1
  VPI: 1.2.3                                 Jetpack: 4.6.1
  Vulkan: 1.2.70
  OpenCV: 4.1.1 with CUDA: NO               Hostname: yahboom
                                            Interfaces
                                             wlan0: 192.168.2.68
                                             docker0: 172.17.0.1


 1ALL  2GPU  3CPU  4MEM  5ENG  6CTRL  7INFO  Quit                     (c) 2023, RB
```

2.Environment construction of YOLO5 (YOLO5 v5.0)

2.1 Download the required modules for YOLO5- Torch

(If you have installed Jetson reference in the environment following the tutorial, this part can be ignored)

```
sudo apt-get install python3-pip libopenblas-base libopenmpi-dev
pip3 install Cython
pip3 install numpy torch-1.8.0-cp36-cp36m-linux_aarch64.whl    # 注意你自己.whl包路径
sudo apt-get install libjpeg-dev zlib1g-dev libpython3-dev libavcodec-dev libavformat-dev libswscale-dev
```

torch-1.8.0-cp36-cp36m-linux_ Aarch64.whl This file is obtained from the attachment built in the environment and transferred to Jetson through WinSCP

2.2 Install the corresponding version of Torchvision

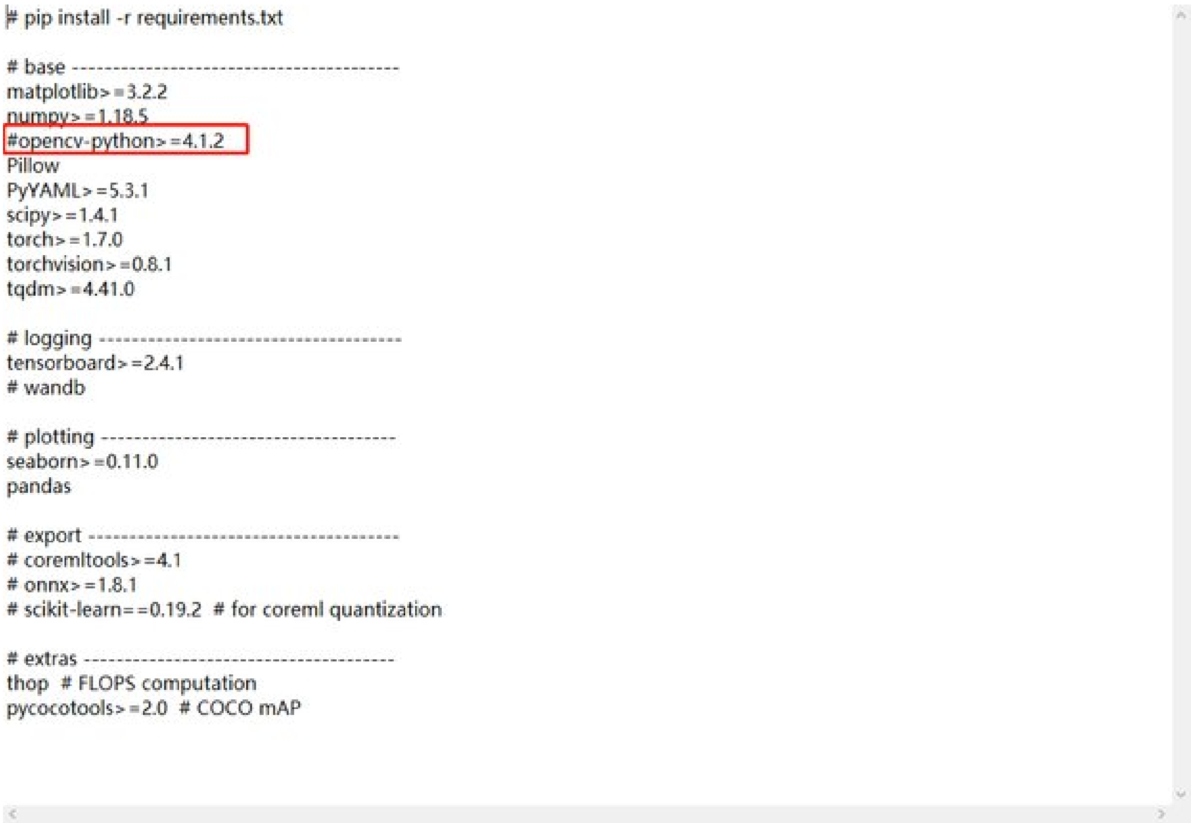
```
git clone --branch v0.9.0 https://github.com/pytorch/vision torchvision
cd torchvision
export BUILD_VERSION=0.9.0
python3 setup.py install --user
```

If git clone reports an error, please check the network and run again

2.3 Download the source code of YOLO5

```
cd ~
git clone https://github.com/marcoslucianops/DeepStream-Yolo
python3 -m pip install --upgrade pip
cd yolov5
```

Because Jetson nano already comes with opencv4.1.1, there is no need to install Python's opencv. You can verify it through import cv2Therefore, we need to open the requirements file in the yolo5 directory and add a # sign before this line



```
# pip install -r requirements.txt

# base ----------------------------------------
matplotlib>=3.2.2
numpy>=1.18.5
#opencv-python>=4.1.2
Pillow
PyYAML>=5.3.1
scipy>=1.4.1
torch>=1.7.0
torchvision>=0.8.1
tqdm>=4.41.0

# logging -------------------------------------
tensorboard>=2.4.1
# wandb

# plotting ------------------------------------
seaborn>=0.11.0
pandas

# export --------------------------------------
# coremltools>=4.1
# onnx>=1.8.1
# scikit-learn==0.19.2  # for coreml quantization

# extras --------------------------------------
thop  # FLOPS computation
pycocotools>=2.0  # COCO mAP
```

Run after modification

```
pip3 install -r requirements.txt -i https://mirror.baidu.com/pypi/sample
```

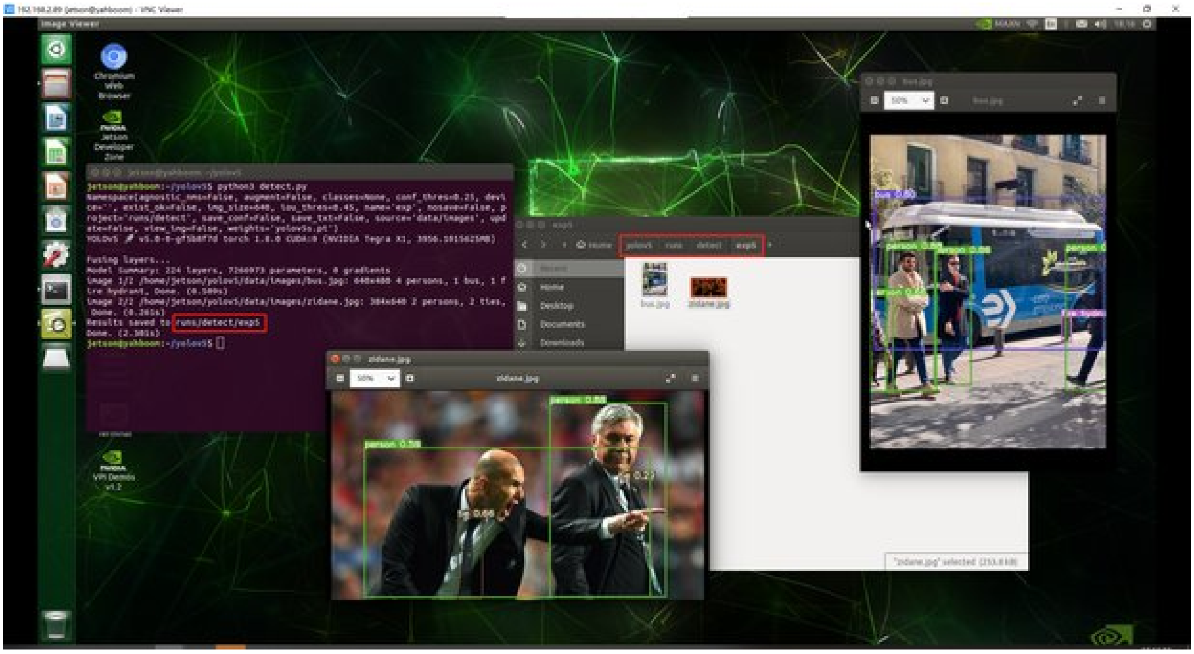
Wait until the download is complete

3.Verify if yolo5 has been successfully built

```
cd ~/yolov5
python3 detect.py
```

Wait for him to automatically download the weight file. If the network is not working, please obtain the yolov5s.pt file from the attachment we provided for environment setup and place it under the yolov5 folderIf there are no errors reported, it indicates that YOLO5 has been successfully built and the identified results will be stored in the YOLOv5/runs/detect/exp path

The following is a picture of successful operation



```
jetson@yahboom:~/yolov5$ python3 detect.py
Namespace(agnostic_nms=False, augment=False, classes=None, conf_thres=0.25, devi
ce='', exist_ok=False, img_size=640, iou_thres=0.45, name='exp', nosave=False, p
roject='runs/detect', save_conf=False, save_txt=False, source='data/images', upd
ate=False, view_img=False, weights='yolov5s.pt')
YOLOv5 🚀 v5.0-0-gf5b8f7d torch 1.8.0 CUDA:0 (NVIDIA Tegra X1, 3956.1015625MB)

Fusing layers...
Model Summary: 224 layers, 7266973 parameters, 0 gradients
image 1/2 /home/jetson/yolov5/data/images/bus.jpg: 640x480 4 persons, 1 bus, 1 f
ire hydrant, Done. (0.509s)
image 2/2 /home/jetson/yolov5/data/images/zidane.jpg: 384x640 2 persons, 2 ties,
 Done. (0.281s)
Results saved to runs/detect/exp5
Done. (2.301s)
jetson@yahboom:~/yolov5$ 
```

Exp5: Because the command python3 detect.py was run for the fifth time, the results were stored in the directory of exp5