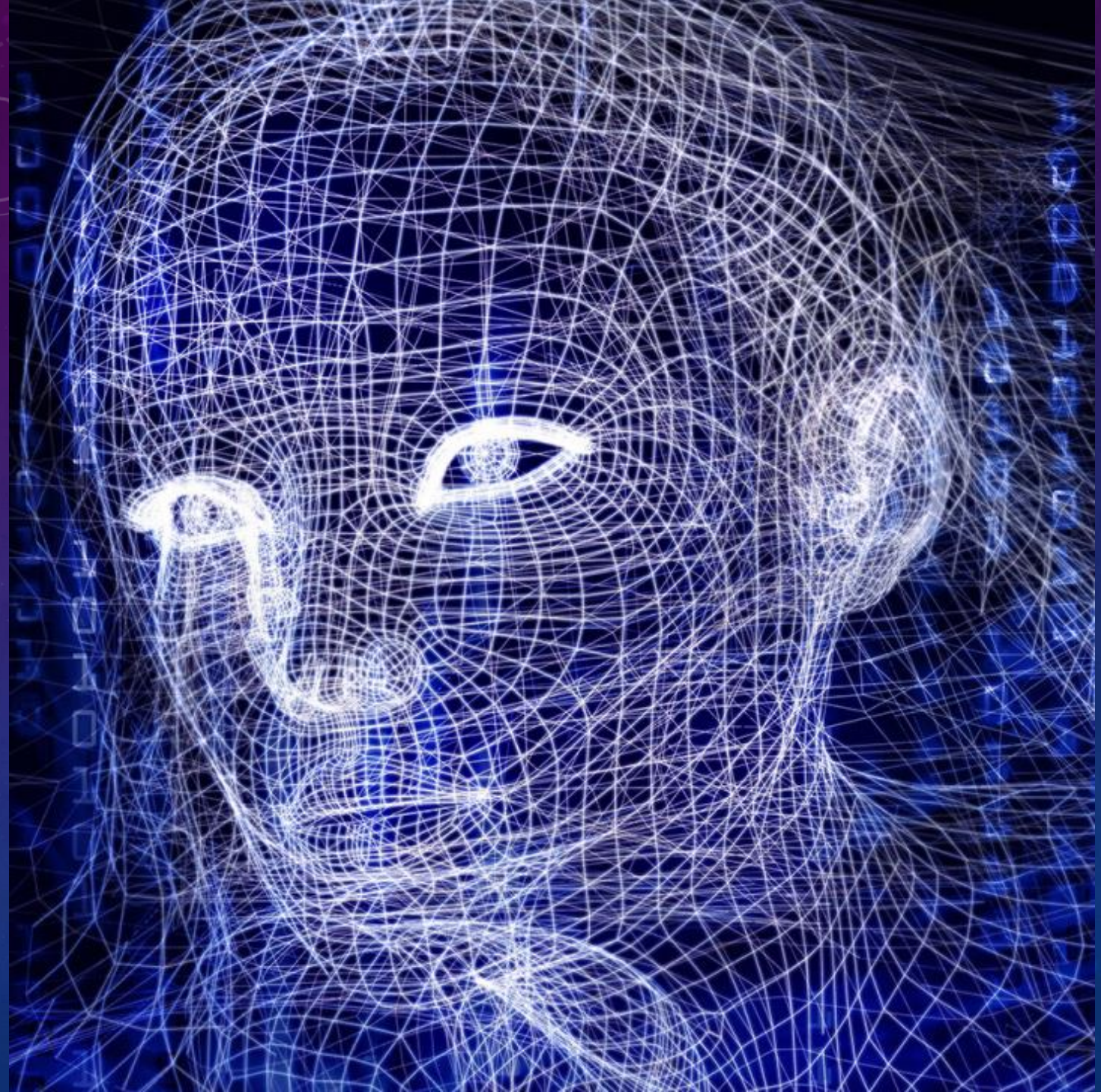
COMPUTER VISION AND ITS APPLICATIONS

CH 1_EXERCISE

徐繼聖

Gee-Sern Jison Hsu

National Taiwan University of Science and Technology



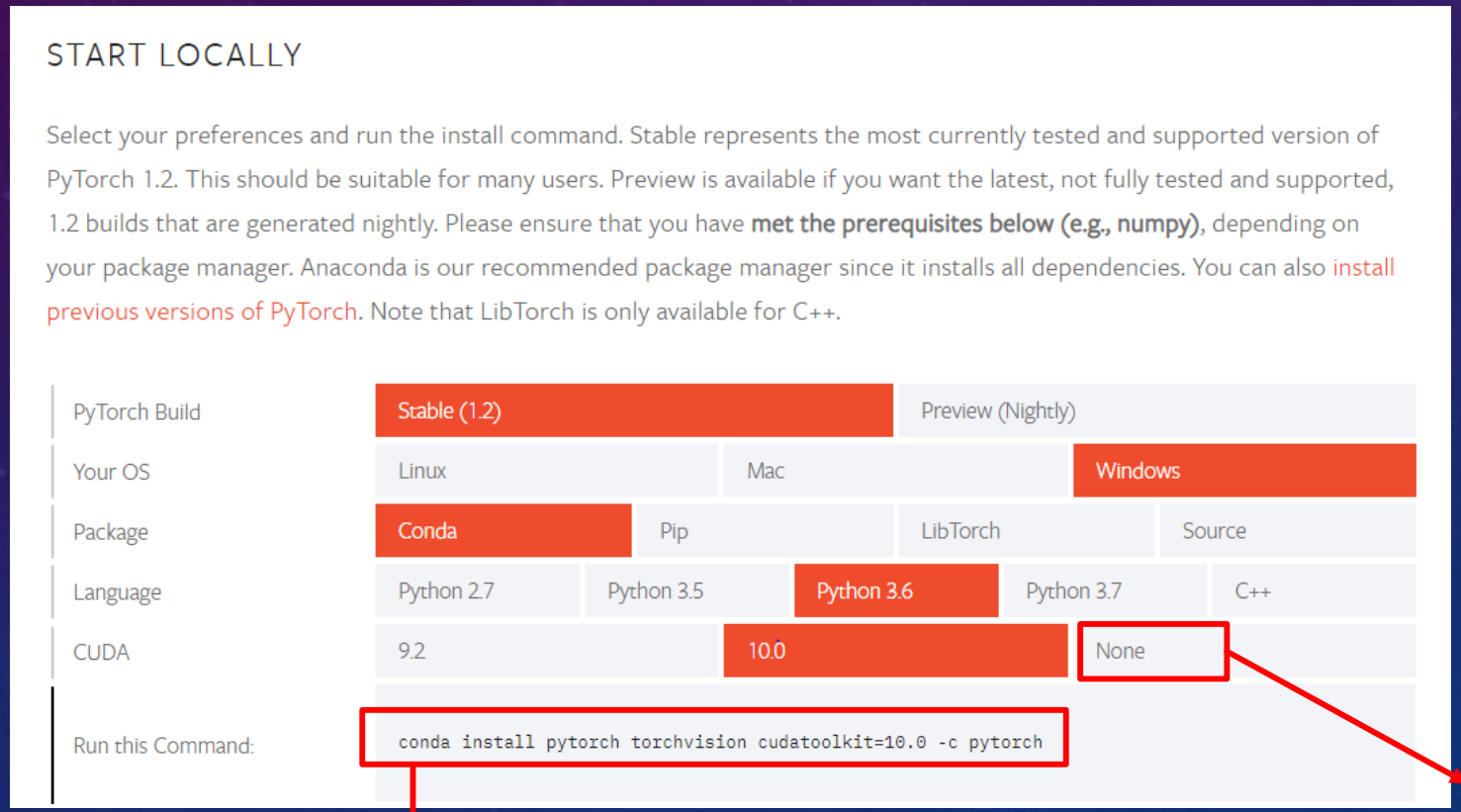
What is Pytorch?

- It’s a Python-based scientific computing package targeted at two sets of audiences:
  - A replacement for NumPy to use the power of GPUs
  - a deep learning research platform that provides maximum flexibility and speed

Installation Process

1. Choose the pytorch version

Pytorch download link : https://pytorch.org/get-started/locally/



Run this code in the Terminal

If you just want to use cpu, you need to select None

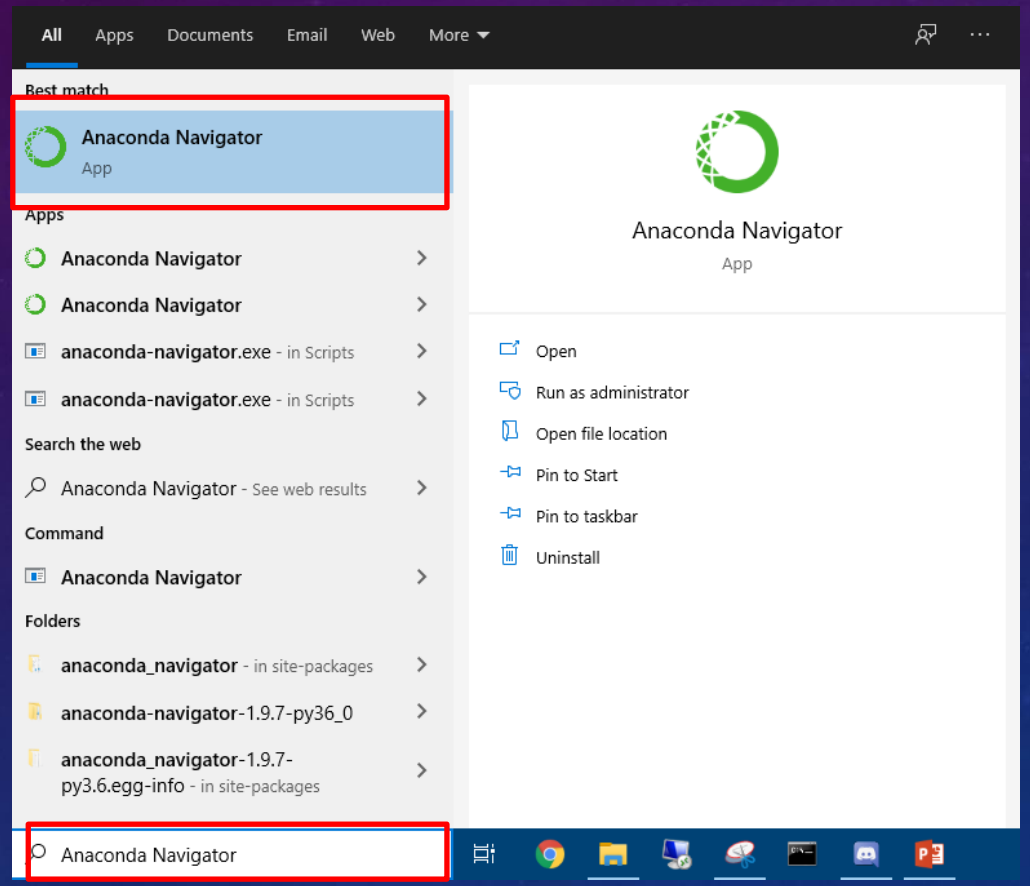
Installation Process

- Pytorch 1.2:
  - **conda install pytorch torchvision cudatoolkit=9.2 -c pytorch -c defaults -c numba/label/dev**
- Because Pytorch(1.2) is only compatible with CUDA 9.2 and 10, the computers in the PC room are not compatible.

- Instead please use the following command to install the Pytorch(1.0, Cuda 8)
  - **conda install pytorch torchvision cudatoolkit=8.0 -c pytorch**

Installation Process

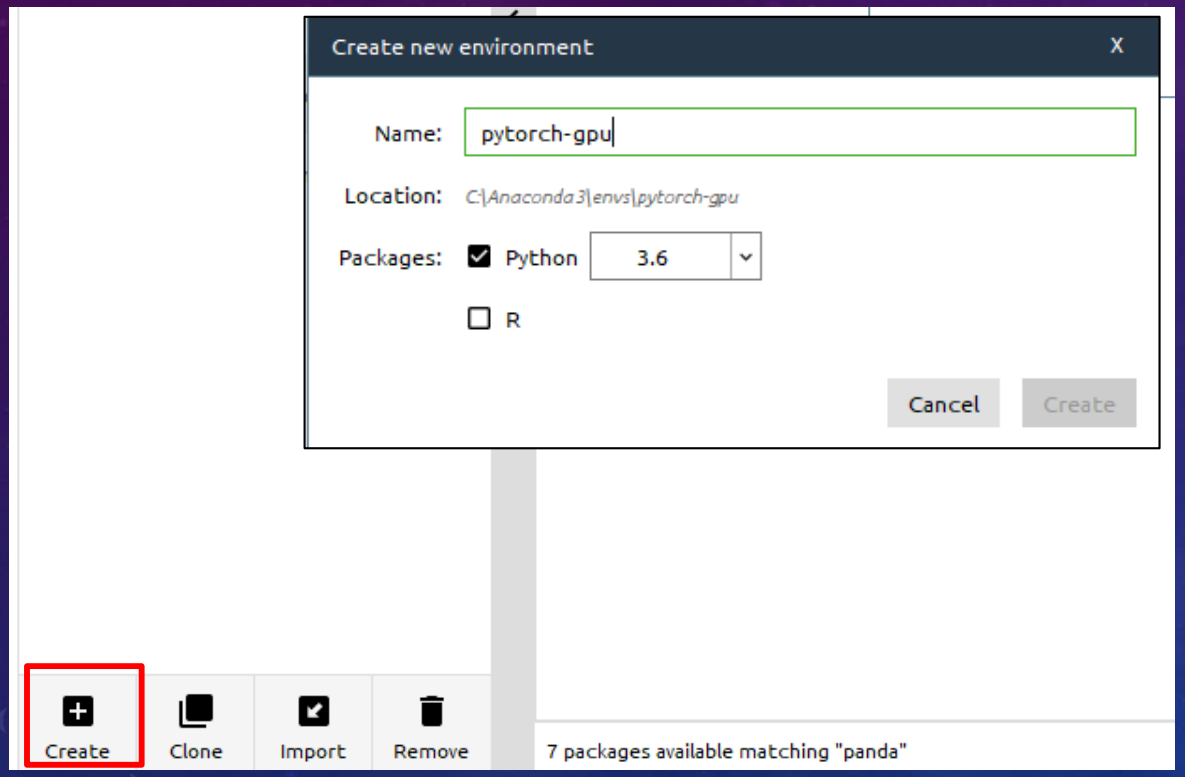
2. Open “Anaconda Navigator”



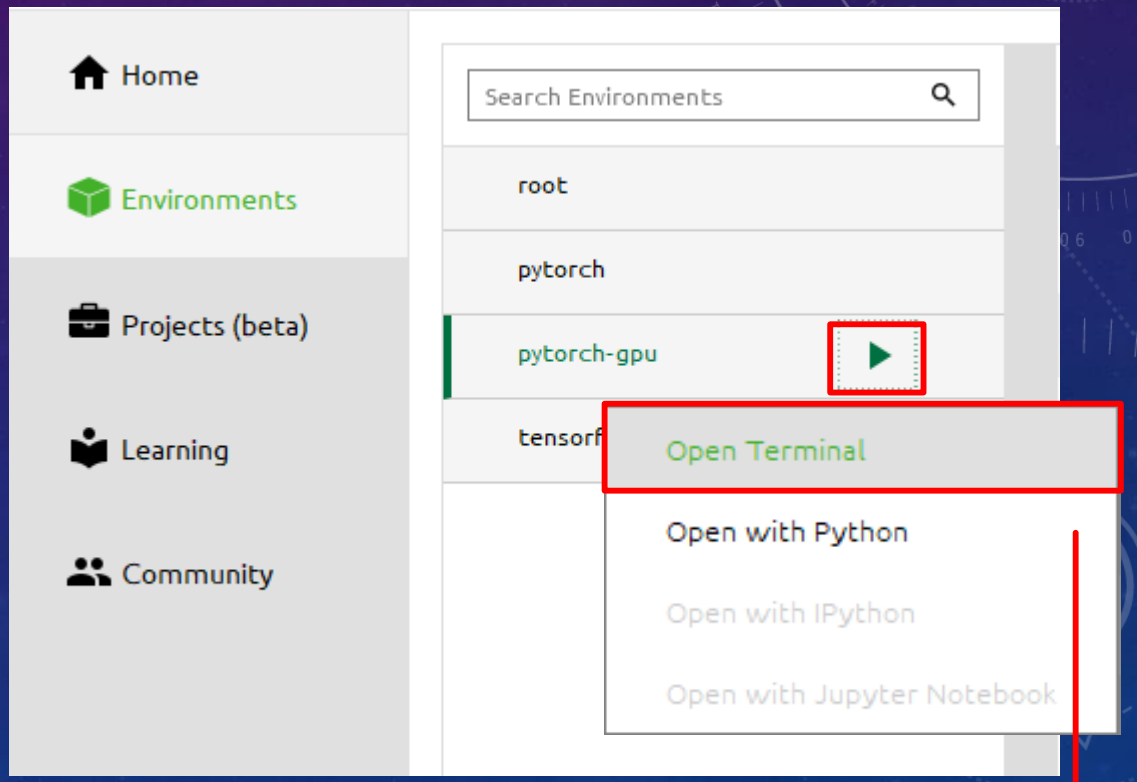
Type “Anaconda Navigator” to search

Installation Process

3. Create the Pytorch environment



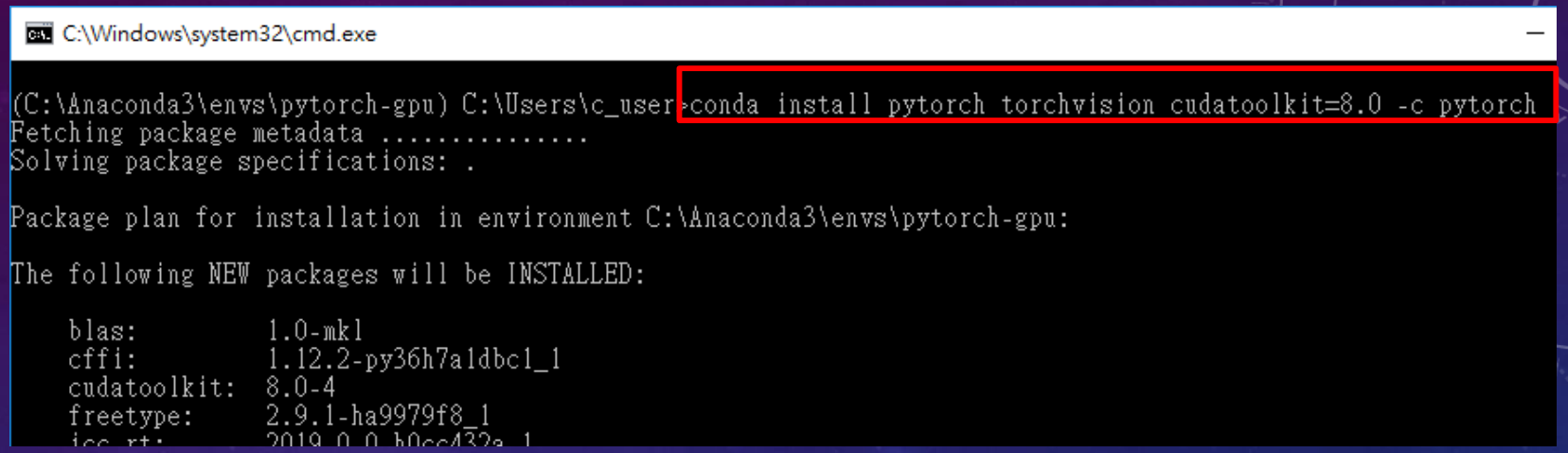
Click the Create



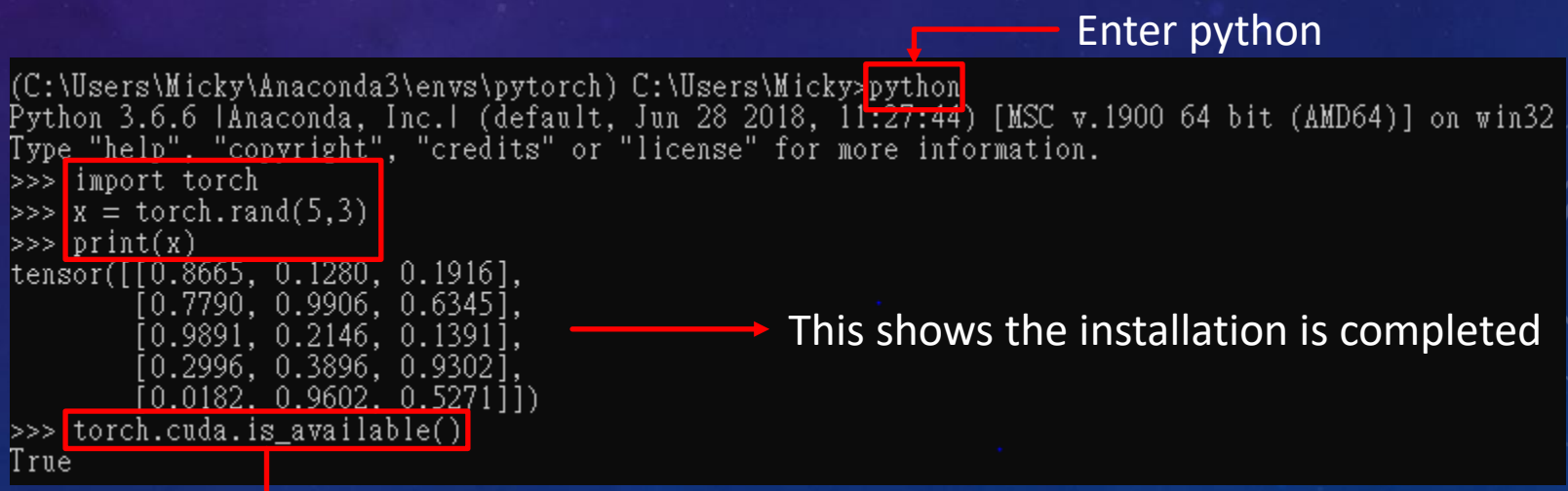
Open the Terminal

Installation Process

4. Install Pytorch

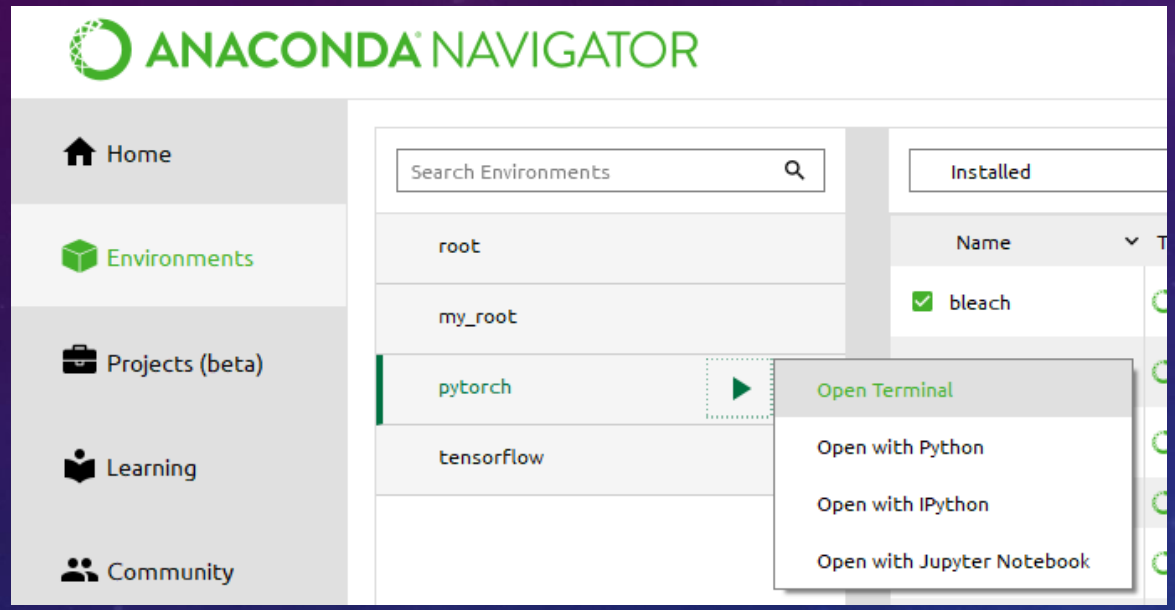


5. Test Pytorch

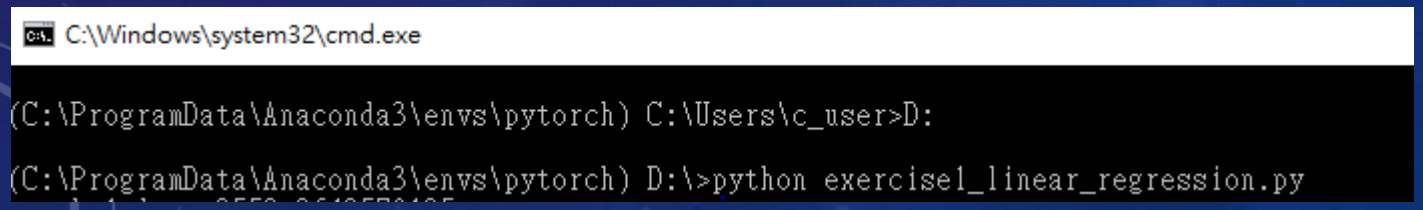


Use The Python File

- Step 1: Download the file from Moodle and save in the D: Drive
- Step 2: Open the anaconda-navigator and choose your environment
- Step 3: Open the terminal



- Step 4:open the python file



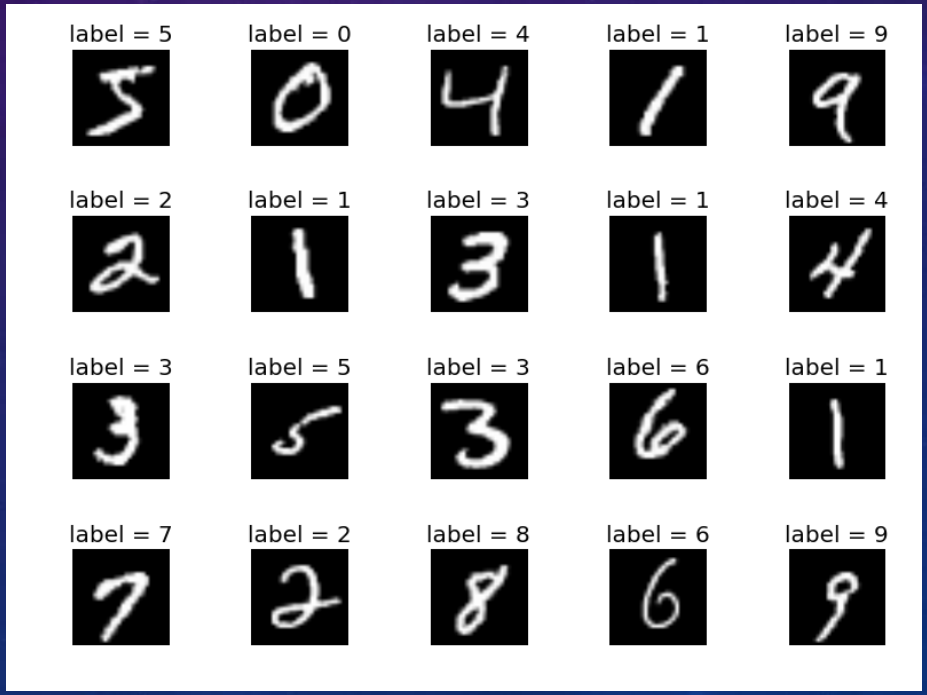
Cd changes the current working directory, example: (cwd)

cd D:\James\

cwd is then inside the James folder

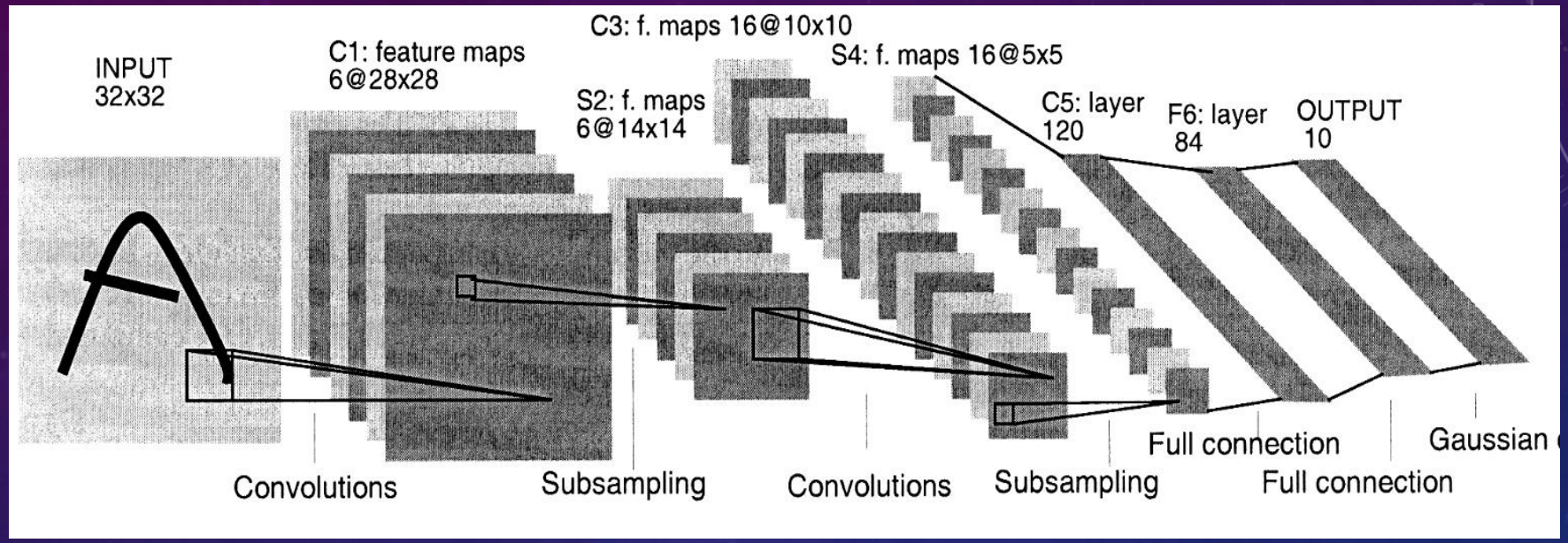
Example 1: Training LeNet on Mnist

- Mnist database is dataset for handwritten digits.
- The dataset consists of pair, “handwritten digit image” and “label”.
  - handwritten digit image: This is gray scale image with size 28 x 28 pixel.
  - label : This is actual digit number this handwritten digit image represents. It is either 0 to 9.



Sample

Example 1: Training LeNet on Mnist



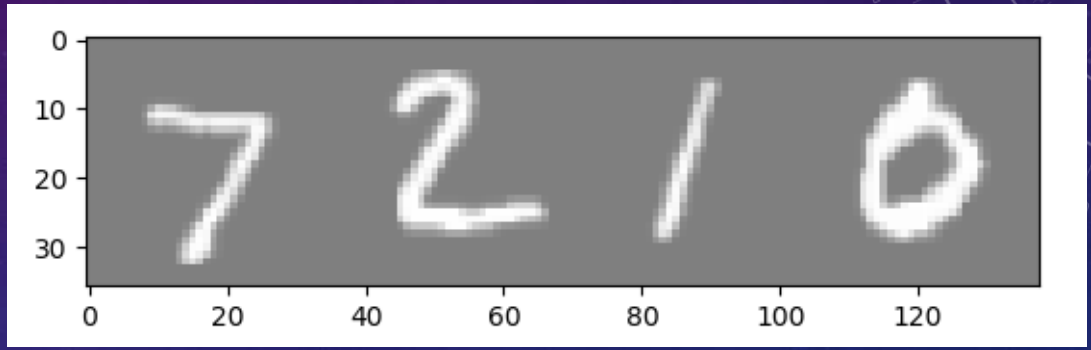

```
LeNet(
  (conv1): Conv2d(1, 6, kernel_size=(5, 5), stride=(1, 1))
  (conv2): Conv2d(6, 16, kernel_size=(5, 5), stride=(1, 1))
  (fc1): Linear(in_features=400, out_features=120, bias=True)
  (fc2): Linear(in_features=120, out_features=84, bias=True)
  (fc3): Linear(in_features=84, out_features=10, bias=True)
)
```

10 classes (0 to 9)

Example 1: Training LeNet on Mnist

The samples in Mnist :

Result :




```
Epoch : 1 steps : 2000 Training Loss : 1.643718808606267
Epoch : 1 steps : 4000 Training Loss : 0.270609632895095 26
Epoch : 1 steps : 6000 Training Loss : 0.154633854069135 85
Epoch : 2 steps : 2000 Training Loss : 0.104100976045709 1
Epoch : 2 steps : 4000 Training Loss : 0.090527190011020 14
Epoch : 2 steps : 6000 Training Loss : 0.075825782120584 34
Finished Training
GroundTruth:      7     2     1     0
Predicted:        7     2     1     0
Accuracy : 98 %
```

Exercise 1: Result on MNIST

(a) Please download “Exercise1_Mnist.7z” from Moodle.

(b) Run the “Exercise1_Mnist.py” to train the model.

(c) Get familiar with Python and Pytorch.

Please copy your results and code and paste to a MS Word, then upload to Moodle.