

Purpose of the Document

1. Establish one AI development SW environment in the local PC
2. Install Python development environment
3. Install Tensorflow and Pytorch AI development environment

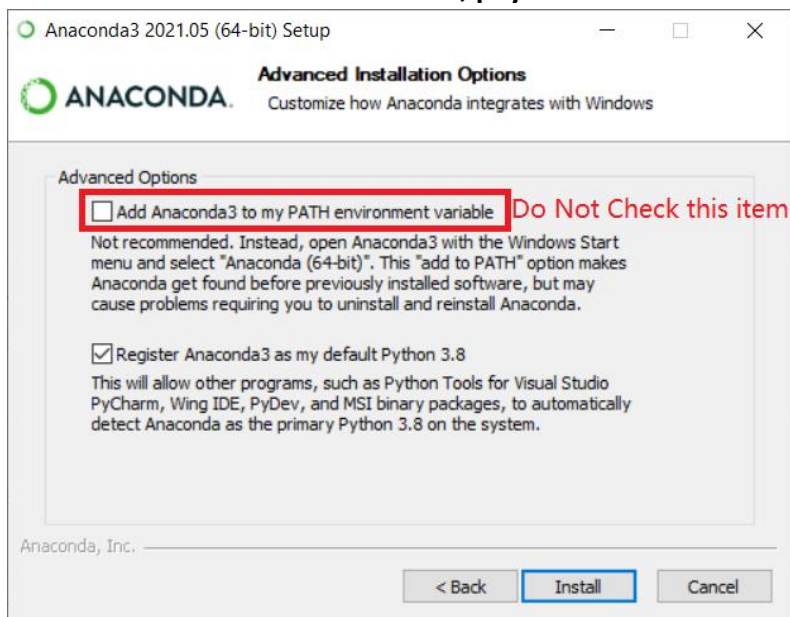
Anaconda Installation – AI Development Environment by Python

1. Download Anaconda based on your requirement.

<https://www.anaconda.com/pricing>

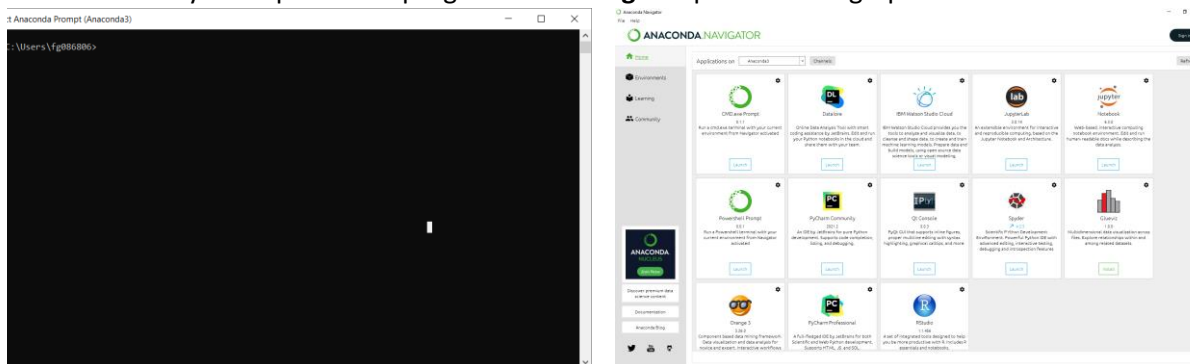
please select the corresponding version based on your OS system.

2. Install the Anaconda environment, pay attention to the following setting



3. Anaconda Prompt vs. Anaconda Navigator

We can access Anaconda through Anaconda **Prompt** or Anaconda **Navigator**. **Prompt** is command-line-based entry for experienced programmer. **Navigator** provides the graphical user interface



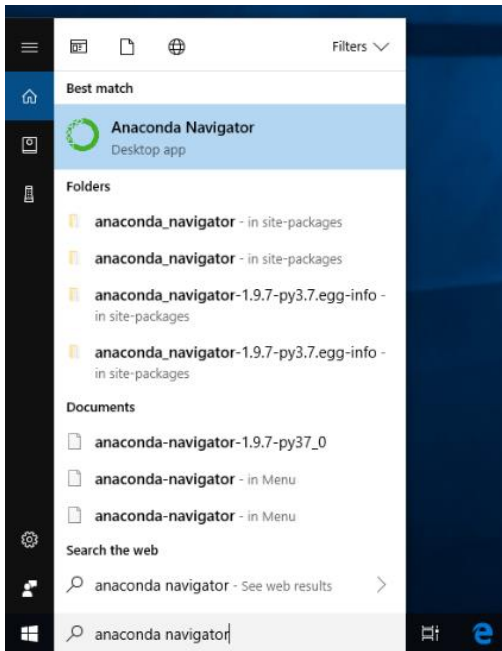
Anaconda Prompt

Anaconda Navigator

4. Start Anaconda Navigator

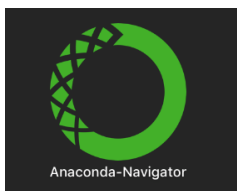
Windows

From the Start menu, click the **Anaconda Navigator** desktop app.



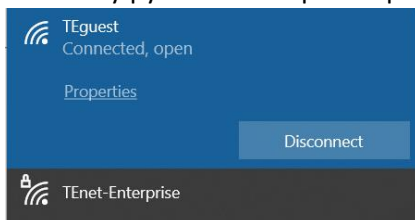
macOS

Open Launchpad, then click the Anaconda Navigator icon.



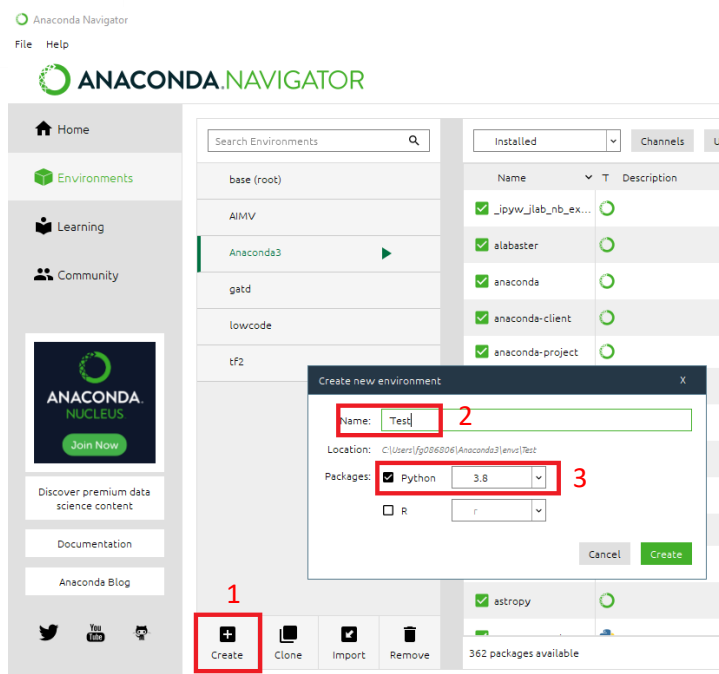
5. Switch Network

If you are using TE network, please switch to **TEguest** network, or else you can not download any necessary python development package.

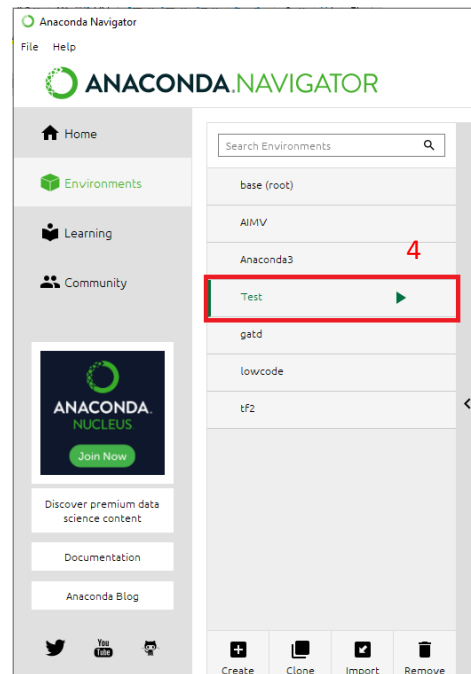


6. Create one New Anaconda Environment

Click **Create** to create one environment named **Test** with **Python 3.X** version. After a while, one **Test** environment is established



Create Test Environment



Test Environment is Created

7. Config Python Package Distribution Source (Optional)

During the usage of Python, we need to download some Python packages. If the download speed is pretty slow, you can config Python package distribution source as follows

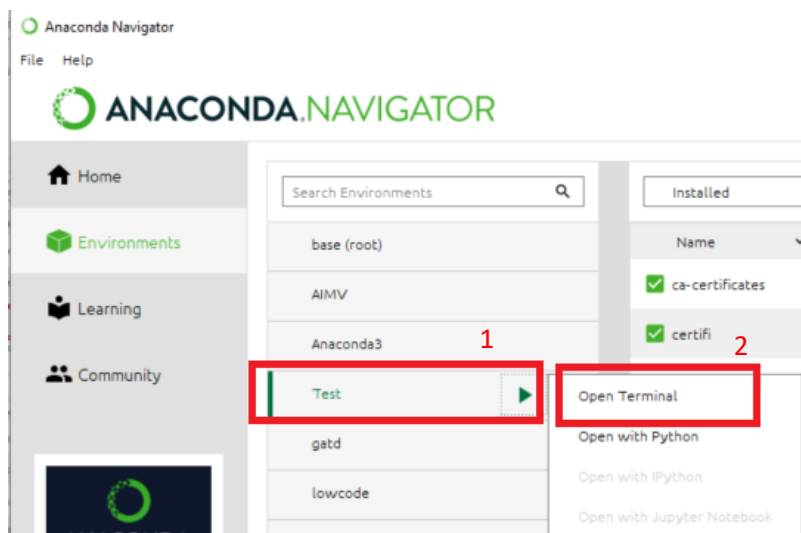
Step 1: Click **Test**

Step 2: Click **Open Terminal**

Step 3: Paste following command in **Terminal**, then press **Enter**

```
pip config set global.index-url https://pypi.tuna.tsinghua.edu.cn/simple
conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgs/free/
conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgs/main/
conda config --set show_channel_urls yes
```

Step 4: Close **Terminal**



```

C:\WINDOWS\system32\cmd.exe

(TFDev) C:\Users\fg086806>pip config set global.index-url https://pypi.tuna.tsinghua.edu.cn/simple
Writing to C:\Users\fg086806\AppData\Local\pip\pip.ini

(TFDev) C:\Users\fg086806>conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkg/free/

(TFDev) C:\Users\fg086806>conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkg/main/

(TFDev) C:\Users\fg086806>conda config --set show_channel_urls yes

(TFDev) C:\Users\fg086806>
  
```

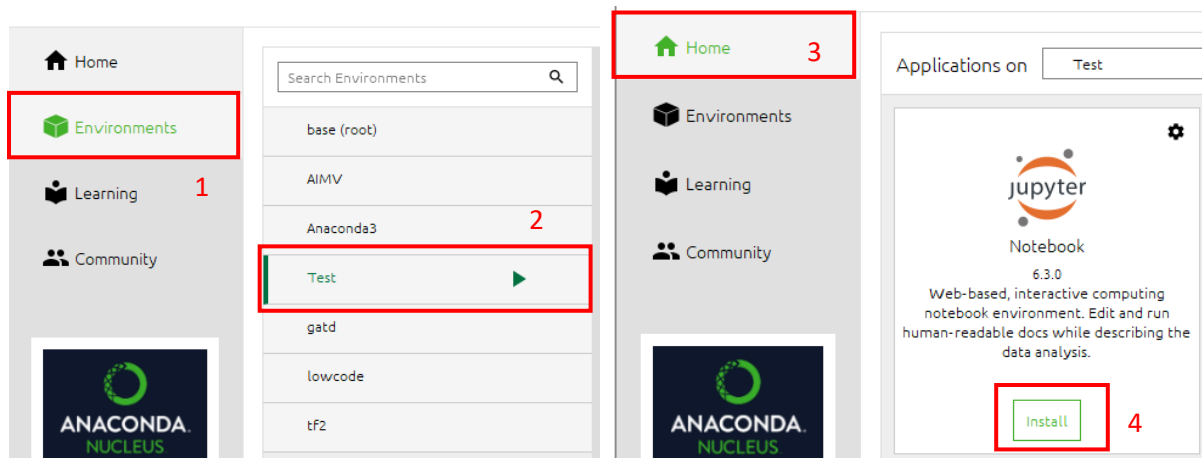
8. Install Jupyter Notebook

Step 1: Switch to **Environment** tab

Step 2: Click **Test** environment for activation

Step 3: Switch to **Home** tab

Step 4: find **jupyter notebook** and click **Install**



9. “Hello World” by Python in Jupyter Notebook

Step 1: Switch to **Environment** tab

Step 2: Click **Test** environment for activation

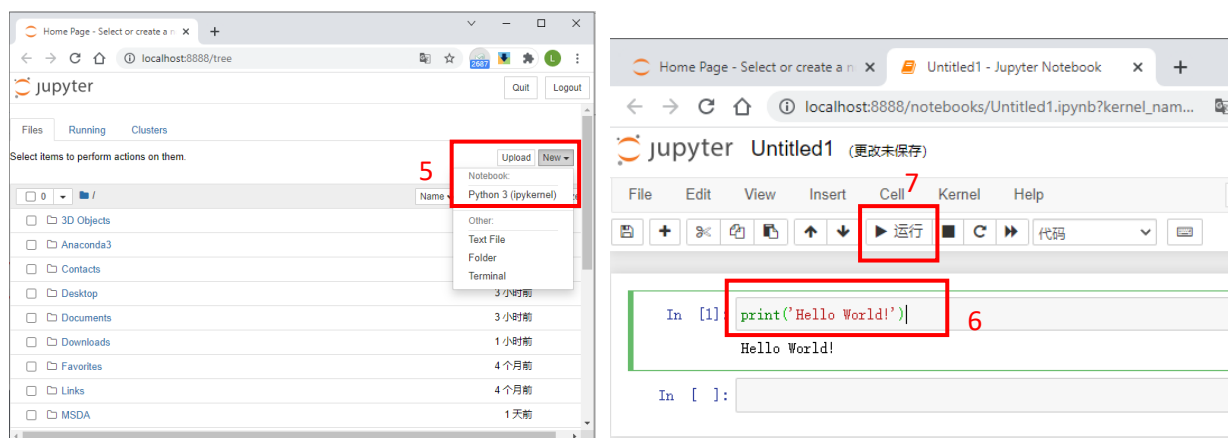
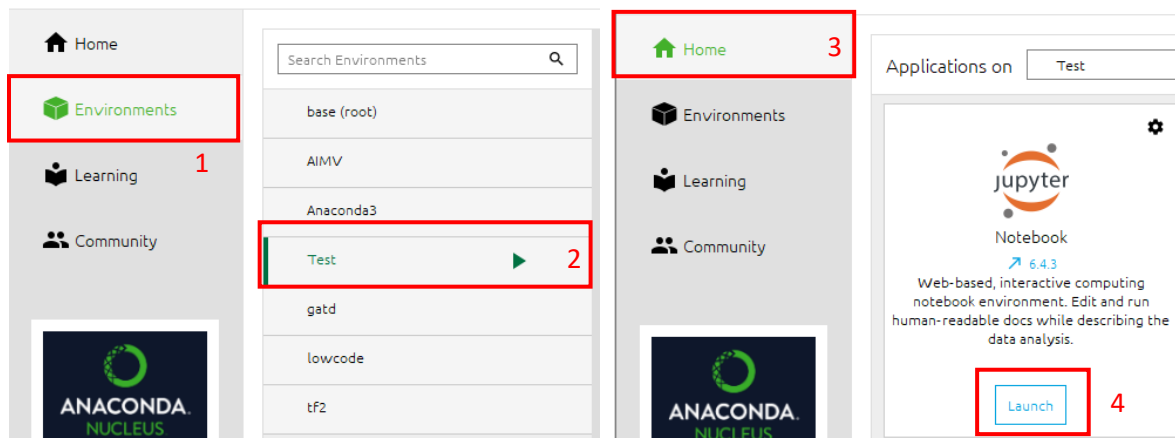
Step 3: Switch to **Home** tab

Step 4: find **jupyter notebook** and click **Launch**, one jupyter notebook will be opened in the browser

Step 5: Click **New** -> **Python 3 (ipykernel)** to create one new notebook

Step 6: Write down **print('Hello World!')** in the notebook

Step 7: Click Run, **Hello World!** will be printed by Python



Extended Reading:

Usage of Anaconda: <https://docs.anaconda.com/>

Python Tutorial: <https://docs.python.org/3.8/tutorial/index.html>

Usage of Jupyter Notebook: <https://jupyter.org/documentation>

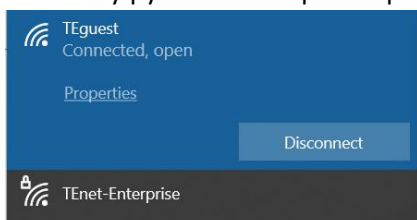
Tensorflow Installation

1. Preparation

- 1) Anaconda is installed correctly
- 2) Please use the Tensorflow CPU version if your PC doesn't have one NVIDIA GPU
- 3) Please use the Tensorflow GPU version if your PC has one NVIDIA GPU
- 4) NVIDIA GPU is recommended to accelerate the speed of AI processing, please upgrade your NVIDIA GPU driver to the latest version

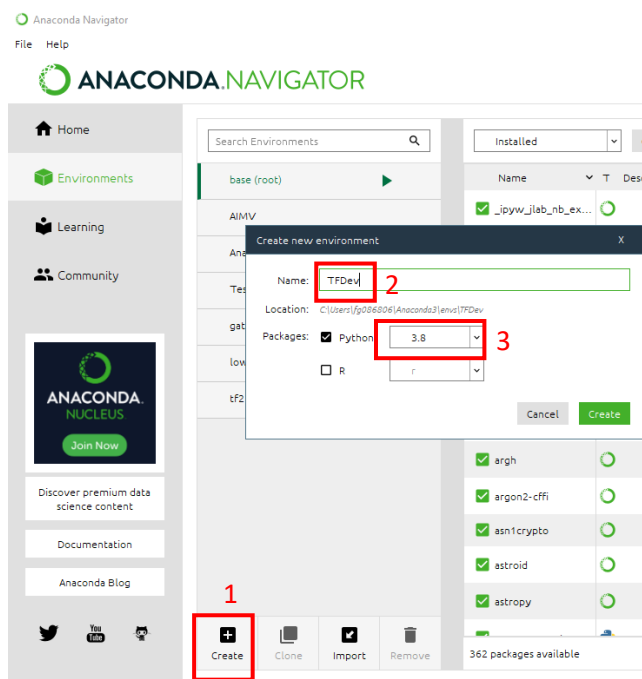
2. Switch Network

If you are using TE network, please switch to **TEguest** network, or else you can not download any necessary python development package.



3. Create Anaconda Environment

Click **Create** to create one environment named **TFDev** with **Python 3.X** version. After a while, one **TFDev** environment is established



4. Config Python Package Distribution Source (Optional)

During the usage of Python, we need to download some Python packages. If the download speed is pretty slow, you can config Python package distribution source as follows

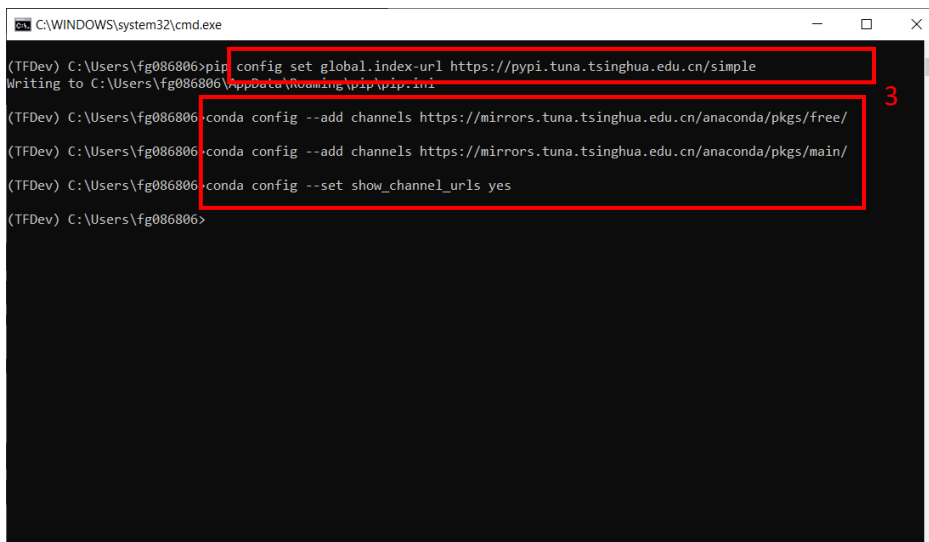
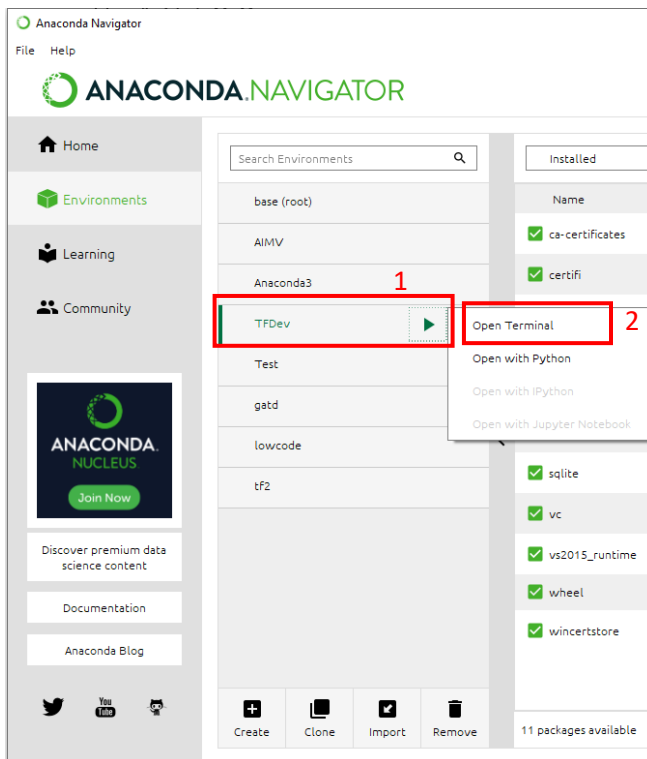
Step 1: Click **TFDev**

Step 2: Click **Open Terminal**

Step 3: Paste following commands one by one in **Terminal**, then press **Enter**

```
pip config set global.index-url https://pypi.tuna.tsinghua.edu.cn/simple
conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgsg/free/
conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgsg/main/
conda config --set show_channel_urls yes
```

Step 4: Close **Terminal**



5. Check the Available Tensorflow Version

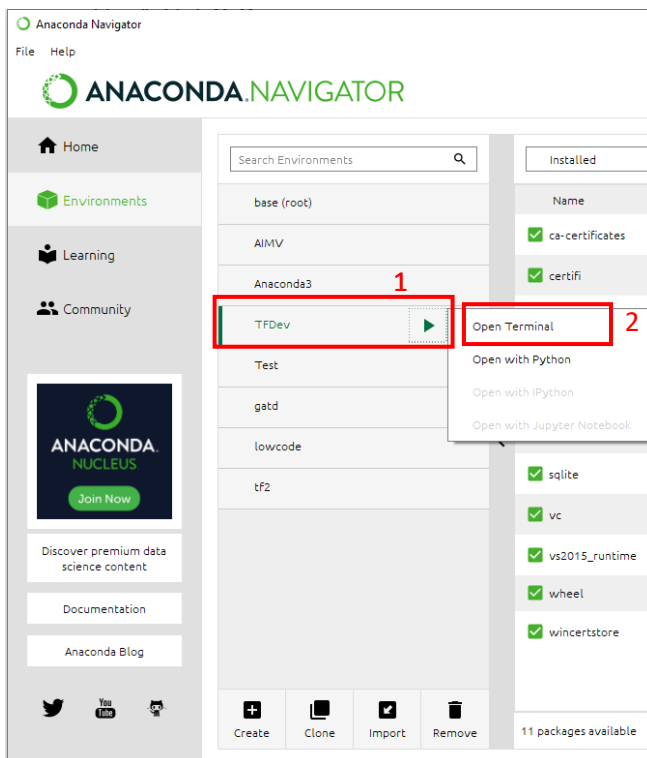
Step 1: Click **TFDev**

Step 2: Click **Open Terminal**

Step 3 for Tensorflow CPU Version: Paste following command in **Terminal**, then press Enter
anaconda show anaconda/tensorflow

Step 3 for Tensorflow GPU Version: Paste following command in **Terminal**, then press Enter
anaconda show anaconda/tensorflow-gpu

Step 4: All the available tensorflow package will be shown in the **Terminal**, if the available versions are not shown, please check your network connection



```

Select C:\WINDOWS\system32\cmd.exe

(TFDev) C:\Users\fg086806>anaconda show anaconda/tensorflow
Using Anaconda API: https://api.anaconda.org
C:\Users\fg086806\Anaconda3\lib\site-packages\urllib3\connectionpool.py:1013: InsecureRequestWarning: Unverified H
TTPS request is being made to host 'api.anaconda.org'. Adding certificate verification is strongly advised. See: h
https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
warnings.warn(
Name: tensorflow
Summary: TensorFlow is a machine learning library.
Access: public
Package Types: conda
Versions:
+ 0.10.0rc0
+ 1.0.1
+ 1.1.0
+ 1.2.1
+ 1.3.0
+ 1.4.1
+ 1.5.0
+ 1.6.0
+ 1.7.0
+ 1.7.1
+ 1.8.0
+ 1.9.0
+ 1.10.0
+ 1.11.0
+ 1.12.0
+ 1.13.1
+ 1.14.0
+ 2.0.0
+ 1.15.0
+ 2.1.0
+ 2.2.0
+ 2.3.0
+ 2.4.1
+ 2.5.0
+ 2.6.0

To install this package with conda run:
conda install --channel https://conda.anaconda.org/anaconda tensorflow

(TFDev) C:\Users\fg086806>
  
```

```

C:\WINDOWS\system32\cmd.exe

(TFDev) C:\Users\fg086806>anaconda show anaconda/tensorflow-gpu
Using Anaconda API: https://api.anaconda.org
C:\Users\fg086806\Anaconda3\lib\site-packages\urllib3\connectionpool.py:1013: InsecureRequestWarning: Unverified H
TTPS request is being made to host 'api.anaconda.org'. Adding certificate verification is strongly advised. See: h
https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
warnings.warn(
Name: tensorflow-gpu
Summary: Metapackage for selecting a TensorFlow variant.
Access: public
Package Types: conda
Versions:
+ 1.0.1
+ 1.1.0
+ 1.2.1
+ 1.3.0
+ 1.4.1
+ 1.5.0
+ 1.6.0
+ 1.7.0
+ 1.8.0
+ 1.9.0
+ 1.10.0
+ 1.11.0
+ 1.12.0
+ 1.13.1
+ 1.14.0
+ 2.0.0
+ 1.15.0
+ 2.1.0
+ 2.2.0
+ 2.3.0
+ 2.4.1
+ 2.5.0

To install this package with conda run:
conda install --channel https://conda.anaconda.org/anaconda tensorflow-gpu

(TFDev) C:\Users\fg086806>
  
```

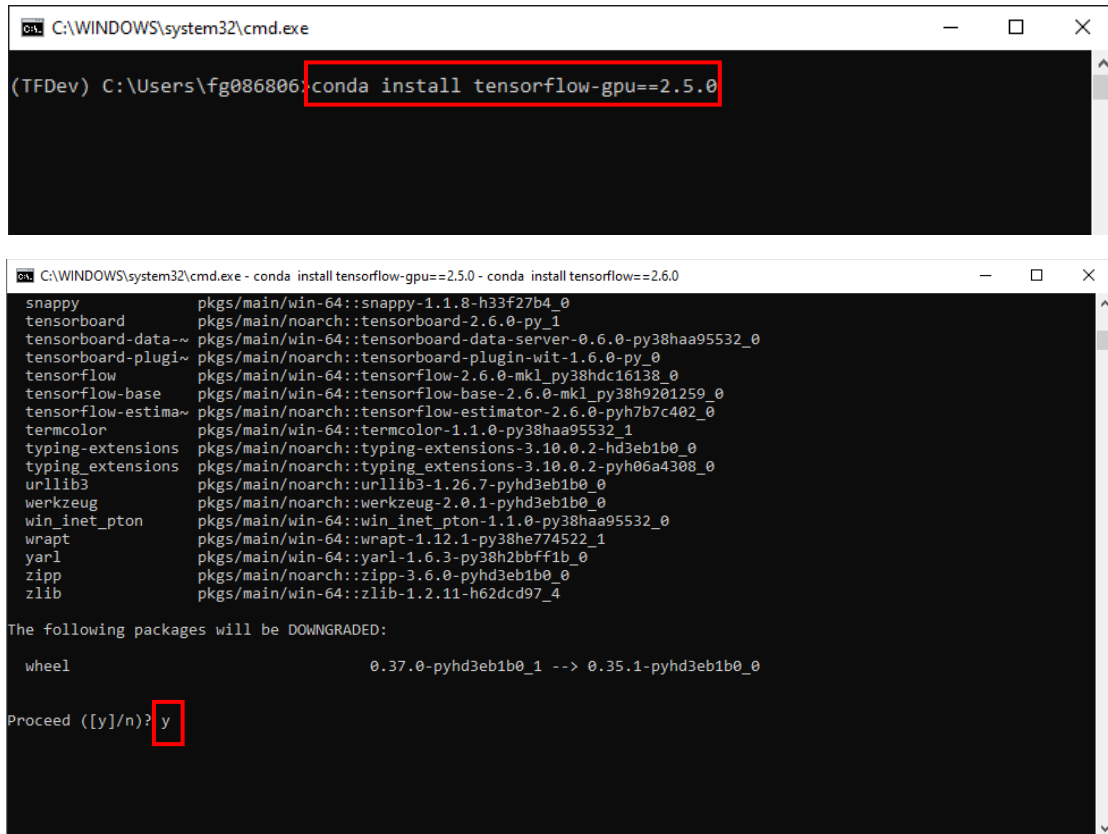
6. Install the Available Tensorflow Version

- Tensorflow CPU Version: Paste following command in **Terminal**, then press **Enter**, 2.6.0 can be replaced by any available version listed above. After a while, input **Y** to approve the installation

conda install tensorflow==2.6.0

- Tensorflow GPU Version: Paste following command in **Terminal**, then press **Enter**, 2.5.0 can be replaced by any available version listed above. After a while, input **Y** to approve the installation

conda install tensorflow-gpu==2.5.0



```

C:\WINDOWS\system32\cmd.exe

(TFDev) C:\Users\fg086806>conda install tensorflow-gpu==2.5.0

C:\WINDOWS\system32\cmd.exe - conda install tensorflow-gpu==2.5.0 - conda install tensorflow==2.6.0
snappy                pkgs/main/win-64::snappy-1.1.8-h33f27b4_0
tensorboard            pkgs/main/noarch::tensorboard-2.6.0-py_1
tensorboard-data-ser~ pkgs/main/win-64::tensorboard-data-server-0.6.0-py38haa95532_0
tensorboard-plugin~   pkgs/main/noarch::tensorboard-plugin-wit-1.6.0-py_0
tensorflow              pkgs/main/win-64::tensorflow-2.6.0-mkl_py38hdc16138_0
tensorflow-base        pkgs/main/win-64::tensorflow-base-2.6.0-mkl_py38h9201259_0
tensorflow-estima~     pkgs/main/noarch::tensorflow-estimator-2.6.0-pyh7b7c402_0
termcolor              pkgs/main/win-64::termcolor-1.1.0-py38haa95532_1
typing-extensions      pkgs/main/noarch::typing-extensions-3.10.0.2-hd3eb1b0_0
typing_extensions     pkgs/main/noarch::typing_extensions-3.10.0.2-pyh6a4308_0
urllib3                pkgs/main/noarch::urllib3-1.26.7-pyhd3eb1b0_0
werkzeug               pkgs/main/noarch::werkzeug-2.0.1-pyhd3eb1b0_0
win_inet_pton          pkgs/main/win-64::win_inet_pton-1.1.0-py38haa95532_0
wrapt                  pkgs/main/win-64::wrapt-1.12.1-py38he774522_1
yarl                   pkgs/main/win-64::yarl-1.6.3-py38h2bbff1b_0
zipp                   pkgs/main/noarch::zipp-3.6.0-pyhd3eb1b0_0
zlib                   pkgs/main/win-64::zlib-1.2.11-h62dcd97_4

The following packages will be DOWNGRADED:

wheel                  0.37.0-pyhd3eb1b0_1 --> 0.35.1-pyhd3eb1b0_0

Proceed ([y/n])? y
  
```

- Make sure “All requested packages already installed” is shown, if not, please check your network connection and retry to run the command above

```
# All requested packages already installed.
```

7. “Hello Tensorflow” in Jupyter Notebook

Step 1: Switch to **Environment** tab

Step 2: Click **TFDev** environment for activation

Step 3: Switch to **Home** tab

Step 4: find **jupyter notebook** and click **Launch**, one jupyter notebook will be opened in the browser.
If jupyter notebook is not installed, firstly install it

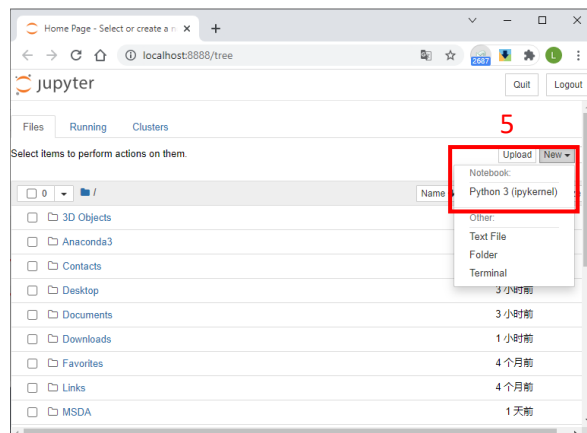
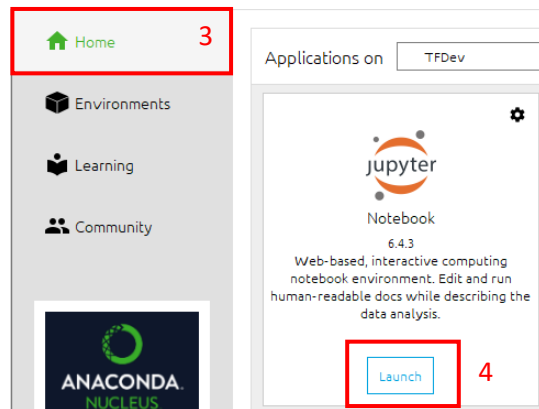
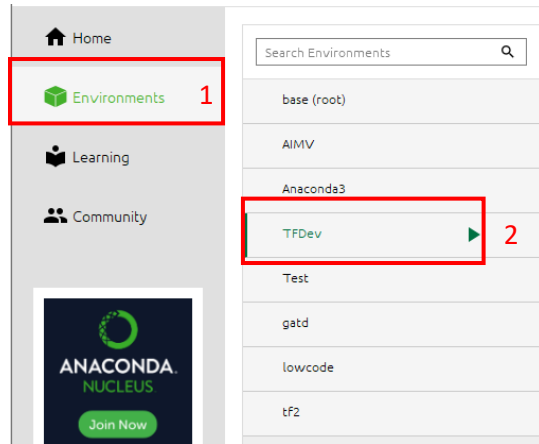
Step 5: Click **New** -> **Python 3 (ipykernel)** to create one new notebook

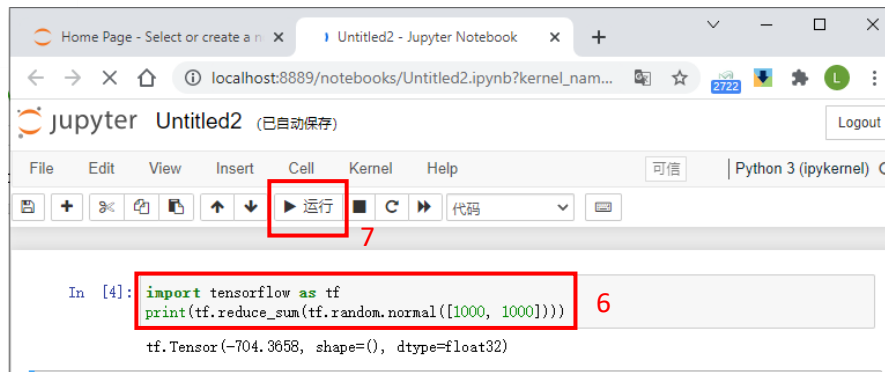
Step 6: Write down the following in the notebook

```
import tensorflow as tf
```

```
print(tf.reduce_sum(tf.random.normal([1000, 1000])))
```

Step 7: Click Run, one random value will be calculated by Tensorflow





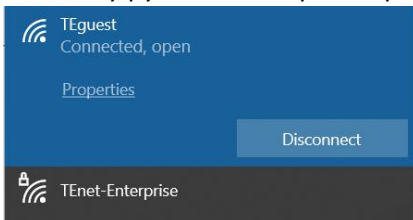
PyTorch Installation

1. Preparation

- 1) Anaconda is installed correctly
- 2) NVIDIA GPU is necessary for PyTorch environment, please upgrade your NVIDIA GPU driver to the latest version

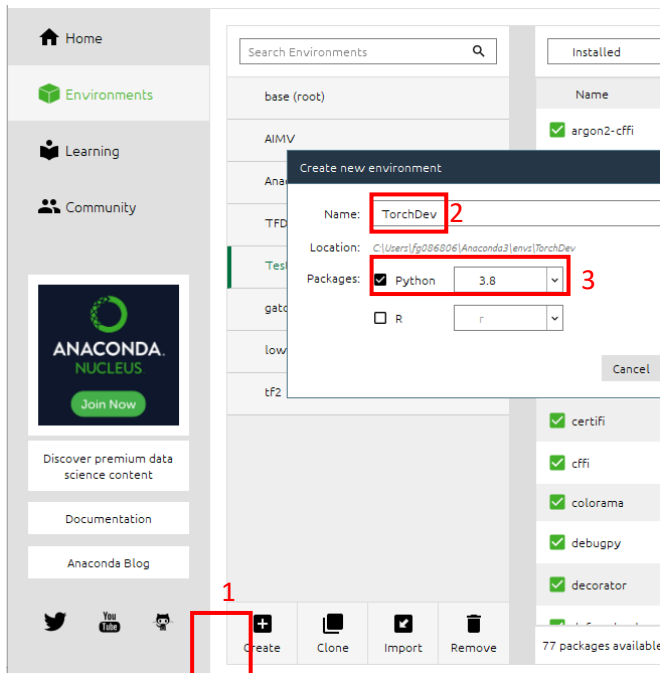
2. Switch Network

If you are using TE network, please switch to **TEguest** network, or else you can not download any necessary python development package.



3. Create Anaconda Environment

Click **Create** to create one environment named **TorchDev** with **Python 3.X** version. After a while, one **TorchDev** environment is established



4. Config Python Package Distribution Source (Optional)

During the usage of Python, we need to download some Python packages. If the download speed is pretty slow, you can config Python package distribution source as follows

Step 1: Click **TorchDev**

Step 2: Click **Open Terminal**

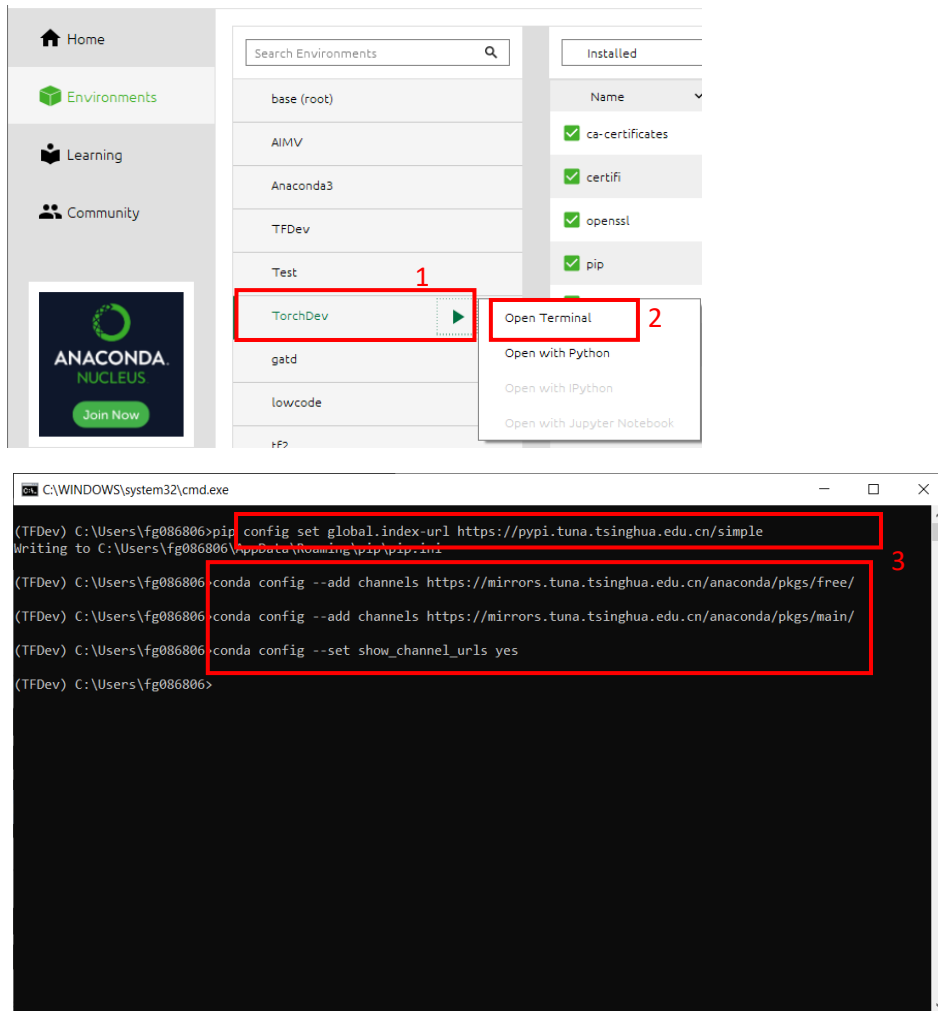
Step 3: Paste following commands one by one in **Terminal**, then press **Enter**

```

pip config set global.index-url https://pypi.tuna.tsinghua.edu.cn/simple
conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkg/free/
conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkg/main/
conda config --set show_channel_urls yes

```

Step 4: Close **Terminal**



5. Install the Available PyTorch Version

- Paste following command in **Terminal**, then press **Enter**. After a while, input **Y** to approve the installation

```
conda install pytorch torchvision torchaudio cudatoolkit=10.2 -c pytorch
```

- For other available PyTorch Version, please find it in the website

<https://pytorch.org/get-started/locally/#windows-anaconda>

<https://pytorch.org/get-started/previous-versions/>

```
C:\WINDOWS\system32\cmd.exe - conda install pytorch torchvision torchaudio cudatoolkit=10.2 -c pytorch
(TorchDev) C:\Users\fg086806>conda install pytorch torchvision torchaudio cudatoolkit=10.2 -c pytorch
Collecting package metadata (current_repodata.json): |
```

```
The following NEW packages will be INSTALLED:
blas                anaconda/pkg/free/win-64::blas-1.0-mkl
cudatoolkit          anaconda/pkg/main/win-64::cudatoolkit-10.2.89-h74a9793_1
freetype             anaconda/pkg/main/win-64::freetype-2.10.4-hd328e21_0
intel-openmp         anaconda/pkg/main/win-64::intel-openmp-2021.3.0-haa95532_3372
jpeg                anaconda/pkg/main/win-64::jpeg-9b-hb83a4c4_2
libpng               anaconda/pkg/main/win-64::libpng-1.6.37-h2a8f88b_0
libtiff              anaconda/pkg/main/win-64::libtiff-4.2.0-hd0e1b90_0
libuv                anaconda/pkg/main/win-64::libuv-1.40.0-he774522_0
lz4-c                anaconda/pkg/main/win-64::lz4-c-1.9.3-h2bbff1b_1
mkl                  anaconda/pkg/main/win-64::mkl-2021.3.0-haa95532_524
mkl-service          anaconda/pkg/main/win-64::mkl-service-2.4.0-py38h2bbff1b_0
mkl_fft              anaconda/pkg/main/win-64::mkl_fft-1.3.0-py38h277e83a_2
mkl_random            anaconda/pkg/main/win-64::mkl_random-1.2.2-py38hf11a4ad_0
msys2-conda-epoch    pkgs/msys2/win-64::msys2-conda-epoch-20160418-1
ninja                anaconda/pkg/free/win-64::ninja-1.7.2-0
numpy                anaconda/pkg/main/win-64::numpy-1.20.3-py38ha4e8547_0
numpy-base           anaconda/pkg/main/win-64::numpy-base-1.20.3-py38hc2deb75_0
olefile              anaconda/pkg/main/noarch::olefile-0.46-pyhd3eb1b0_0
pillow               anaconda/pkg/main/win-64::pillow-8.3.1-py38h4fa10fc_0
pytorch              pytorch/win-64::pytorch-1.9.1-py3.8_cuda10.2_cudnn7_0
six                  anaconda/pkg/main/noarch::six-1.16.0-pyhd3eb1b0_0
tk                   anaconda/pkg/main/win-64::tk-8.6.11-h2bbff1b_0
torchaudio           pytorch/win-64::torchaudio-0.9.1-py38
torchvision          pytorch/win-64::torchvision-0.10.1-py38_cu102
typing_extensions    anaconda/pkg/main/noarch::typing_extensions-3.10.0.2-pyh06a4308_0
xz                   anaconda/pkg/main/win-64::xz-5.2.5-h62dcd97_0
zlib                 anaconda/pkg/main/win-64::zlib-1.2.11-h62dcd97_4
zstd                 anaconda/pkg/main/win-64::zstd-1.4.9-h19a0ad4_0

Proceed ([y]/n)? y
```

- Make sure “All requested packages already installed” is shown, if not, please check your network connection and retry to run the command above

```
# All requested packages already installed.
```

6. “Hello PyTorch” in Jupyter Notebook

Step 1: Switch to **Environment** tab

Step 2: Click **TorchDev** environment for activation

Step 3: Switch to **Home** tab

Step 4: find **jupyter notebook** and click **Launch**, one jupyter notebook will be opened in the browser.

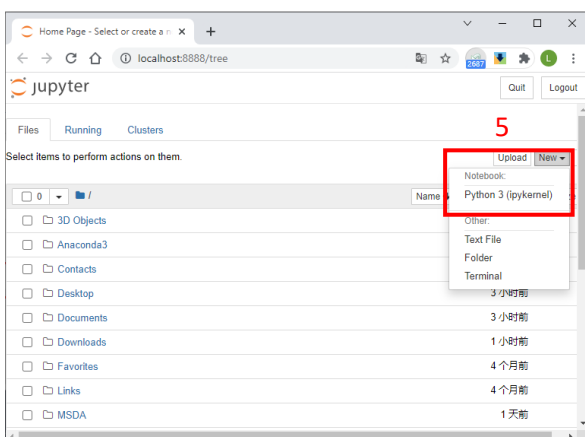
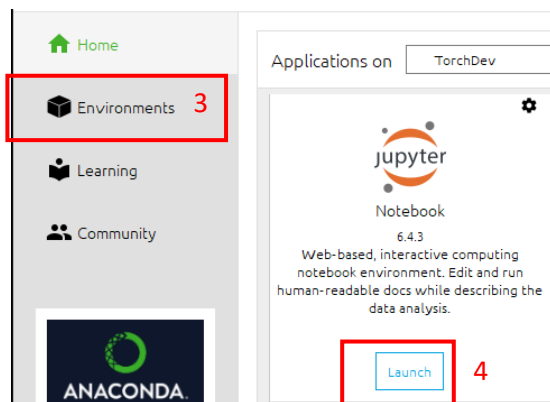
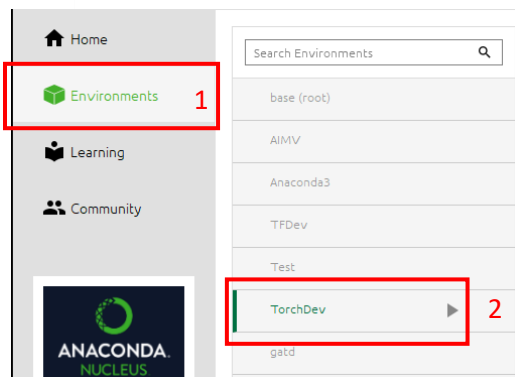
If jupyter notebook is not installed, firstly install it

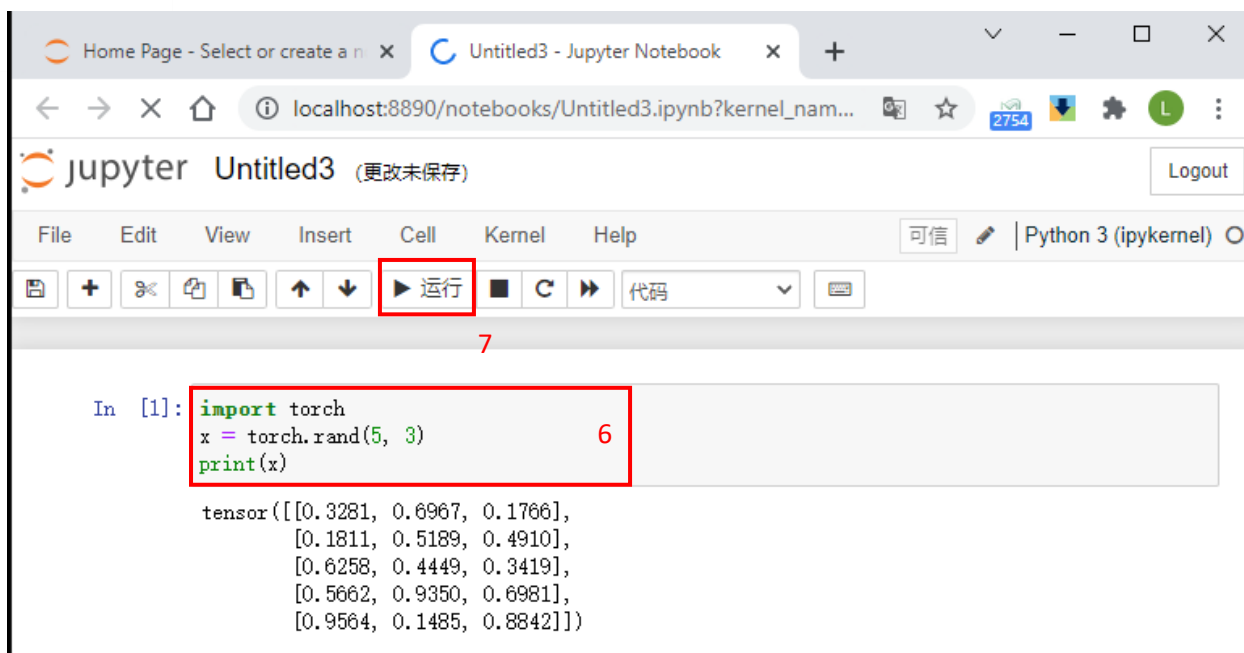
Step 5: Click **New** -> **Python 3 (ipykernel)** to create one new notebook

Step 6: Write down the following in the notebook

```
import torch
x = torch.rand(5, 3)
print(x)
```

Step 7: Click Run, one 5*3 matrix with random value will be calculated by PyTorch





The screenshot displays a web browser window with a Jupyter Notebook titled "Untitled3". The browser's address bar shows the URL `localhost:8890/notebooks/Untitled3.ipynb?kernel_nam...`. The Jupyter interface includes a top bar with the "jupyter" logo, the notebook title "Untitled3 (更改未保存)", and a "Logout" button. Below this is a menu bar with "File", "Edit", "View", "Insert", "Cell", "Kernel", and "Help". A toolbar contains icons for saving, adding cells, undo, redo, and running code. The "运行" (Run) button is highlighted with a red box. The code cell, labeled "In [1]:", contains the following Python code:

```
import torch
x = torch.rand(5, 3)
print(x)
```

The code is also highlighted with a red box. The output of the code is displayed below the cell:

```
tensor([[0.3281, 0.6967, 0.1766],
        [0.1811, 0.5189, 0.4910],
        [0.6258, 0.4449, 0.3419],
        [0.5662, 0.9350, 0.6981],
        [0.9564, 0.1485, 0.8842]])
```

Red numbers "6" and "7" are present in the image, likely indicating steps in a sequence.