

深度学习课程设计

实验 0：编程开发环境搭建

一、开发环境简介

本实践课程所使用的开发环境如下：

编程语言：Python 3.7 （可通过 conda 命令安装）

深度学习环境管理：Conda , Pip

编程工具：VS Code + Jupyter Notebook

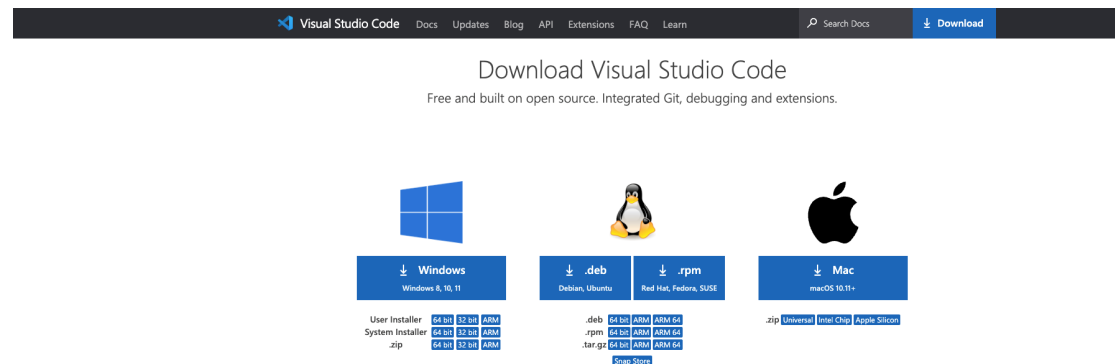
深度学习框架：PyTorch

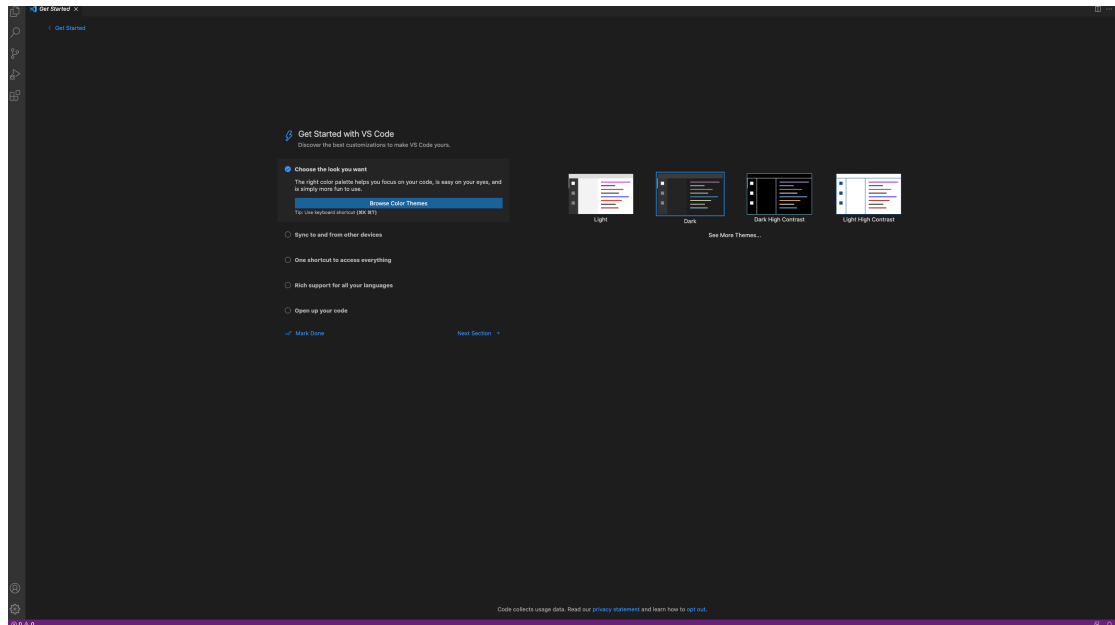
二、环境搭建

1. VS Code 下载

下载链接：[vscode 下载](#)

可以选择 Windows 版本或者 Mac OS 版本进行下载安装





2. Conda 下载

下载链接：[windows 系统下载](#)、[MacOS 系统下载](#)

按照默认进行安装即可



验证是否安装成功

Windows 用户请打开 Anaconda prompt，输入 conda info，出现如下内容表示安装成功。

```

(base) C:\Users\zrx\conda info

active environment : D:\anaconda
active env location : D:\anaconda
shell level : 1
user config file : C:\Users\zrx\.condarc
populated config files : C:\Users\zrx\.condarc
conda version : 4.12.0
conda-build version : 3.21.8
python version : 3.9.12.final.0
virtual packages : _cuda=11.6=0
                  _win=0=0
                  archspec=1=x86_64
base environment : E:\CodeFolder\Anaconda3 (read only)
conda av data dir : E:\CodeFolder\Anaconda3\etc\conda
conda av metadata url : None
channel URLs : http://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgs/free/win-64
               http://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgs/free/noarch
               http://mirrors.tuna.tsinghua.edu.cn/anaconda/cloud/conda-forge/win-64
               http://mirrors.tuna.tsinghua.edu.cn/anaconda/cloud/conda-forge/noarch
               http://mirrors.ustc.edu.cn/anaconda/pkgs/free/win-64
               http://mirrors.ustc.edu.cn/anaconda/pkgs/free/noarch
package cache : E:\CodeFolder\Anaconda3\pkgs
                 C:\Users\zrx\conda\pkgs
                 C:\Users\zrx\AppData\Local\conda\conda\pkgs
envs directories : C:\Users\zrx\conda\envs
                  E:\CodeFolder\Anaconda3\envs
                  C:\Users\zrx\AppData\Local\conda\conda\envs
platform : win-64
user-agent : conda/4.12.0 requests/2.27.1 CPython/3.9.12 Windows/10 Windows/10.0.22000
administrator : False
netrc file : None
offline mode : False

(base) C:\Users\zrx>
```

MacOS 用户请打开 MacOS 的 terminal，输入 conda info,出现如下内容表示安装成功。

```

(base) wangye@bogon ~$ conda info

active environment : base
active env location : /Users/wangye/anaconda3
shell level : 1
user config file : /Users/wangye/.condarc
populated config files : /Users/wangye/.condarc
conda version : 4.5.11
conda-build version : 3.15.1
python version : 3.7.0.final.0
base environment : /Users/wangye/anaconda3 (writable)
channel URLs : https://repo.anaconda.com/pkgs/main/osx-64
               https://repo.anaconda.com/pkgs/main/noarch
               https://repo.anaconda.com/pkgs/free/osx-64
               https://repo.anaconda.com/pkgs/free/noarch
               https://repo.anaconda.com/pkgs/r/osx-64
               https://repo.anaconda.com/pkgs/r/noarch
               https://repo.anaconda.com/pkgs/pro/osx-64
               https://repo.anaconda.com/pkgs/pro/noarch
package cache : /Users/wangye/anaconda3/pkgs
                 /Users/wangye/.conda/pkgs
envs directories : /Users/wangye/anaconda3/envs
                  /Users/wangye/.conda/envs
platform : osx-64
user-agent : conda/4.5.11 requests/2.19.1 CPython/3.7.0 Darwin/20.3.0 OSX/10.16
UID:GID : 501:20
netrc file : None
offline mode : False
```

3. 搭建深度学习环境

1) 配置清华源（网络原因，国内的源能够加速下载）

Conda :

```
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 --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/cloud/pytorch/  
conda config --add channels https://mirrors.tuna.tsinghua.edu.cn/anaconda/cloud/conda-forge/  
conda config --set show_channel_urls yes
```

配置完成后，可通过 `conda info` 命令查看：

如出现红色框内内容，则代表配置成功。

```
(base) wangye@bogon ~$ conda info  
  
active environment : base  
active env location : /Users/wangye/anaconda3  
shell level : 1  
user config file : /Users/wangye/.condarc  
populated config files : /Users/wangye/.condarc  
conda version : 4.5.11  
conda-build version : 3.15.1  
python version : 3.7.0.final.0  
base environment : /Users/wangye/anaconda3 (writable)  
channel URLs : https://mirrors.tuna.tsinghua.edu.cn/anaconda/cloud/conda-forge/osx-64  
                https://mirrors.tuna.tsinghua.edu.cn/anaconda/cloud/conda-forge/noarch  
                https://mirrors.tuna.tsinghua.edu.cn/anaconda/cloud/pytorch/osx-64  
                https://mirrors.tuna.tsinghua.edu.cn/anaconda/cloud/pytorch/noarch  
                https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgsg/main/osx-64  
                https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgsg/main/noarch  
                https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgsg/free/osx-64  
                https://mirrors.tuna.tsinghua.edu.cn/anaconda/pkgsg/free/noarch  
                https://repo.anaconda.com/pkgsg/main/osx-64  
                https://repo.anaconda.com/pkgsg/main/noarch  
                https://repo.anaconda.com/pkgsg/free/osx-64  
                https://repo.anaconda.com/pkgsg/free/noarch  
                https://repo.anaconda.com/pkgsg/r/osx-64  
                https://repo.anaconda.com/pkgsg/r/noarch  
                https://repo.anaconda.com/pkgsg/pro/osx-64  
                https://repo.anaconda.com/pkgsg/pro/noarch  
package cache : /Users/wangye/anaconda3/pkgsg  
                /Users/wangye/.conda/pkgsg  
envs directories : /Users/wangye/anaconda3/envs  
                  /Users/wangye/.conda/envs  
platform : osx-64  
user-agent : conda/4.5.11 requests/2.19.1 CPython/3.7.0 Darwin/20.3.0 OSX/10.16  
UID:GID : 501:20  
netrc file : None  
offline mode : False
```

Pip :

```
python -m pip install --upgrade pip  
pip config set global.index-url https://pypi.tuna.tsinghua.edu.cn/simple
```

配置完成后，使用 `pip config list` 命令查看。

若出现以下内容则说明配置成功：

```
(dl3) C:\Users\Spb>pip config list  
global.index-url='https://pypi.tuna.tsinghua.edu.cn/simple'
```

2) Conda 创建环境

`conda create -n DL python=3.7`

其中, `-n` 是 `-name` 的缩写, `DL` 是你自己拟定的环境名, 当然, 可以根据自己的喜好和需求, 拟定不同的名字, `python=3.7` 用来指定当前创建的环境中 `python` 的版本。

```
wangye@wangyedeMacBook-Air ~$ conda create -n DL python=3.7
Solving environment: done

==> WARNING: A newer version of conda exists. <==
  current version: 4.5.11
  latest version: 4.14.0

Please update conda by running

  $ conda update -n base -c defaults conda

## Package Plan ##

  environment location: /Users/wangye/anaconda3/envs/DL

  added / updated specs:
    - python=3.7

The following packages will be downloaded:



| package                    | build          | size    | url                                           |
|----------------------------|----------------|---------|-----------------------------------------------|
| openssl-1.1.1q             | hca72f7f_0     | 3.5 MB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| tk-8.6.12                  | h5d9f67b_0     | 3.4 MB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| python-3.7.13              | hdfd78df_0     | 24.7 MB | https://mirrors.aliyun.com/anaconda/pkgs/main |
| ca-certificates-2022.07.19 | hecd8cb5_0     | 131 KB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| setuptools-63.4.1          | py37hecd8cb5_0 | 1.4 MB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| readline-8.1.2             | hca72f7f_1     | 390 KB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| ncurses-6.3                | hca72f7f_3     | 1.1 MB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| wheel-0.37.1               | pyhd3eb1b0_0   | 31 KB   | https://mirrors.aliyun.com/anaconda/pkgs/main |
| libffi-3.3                 | hb1e8313_2     | 48 KB   | https://mirrors.aliyun.com/anaconda/pkgs/main |
| sqlite-3.39.2              | h707629a_0     | 1.8 MB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| certifi-2022.6.15          | py37hecd8cb5_0 | 157 KB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| xz-5.2.5                   | hca72f7f_1     | 272 KB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| zlib-1.2.12                | h4dc903c_2     | 116 KB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| libcxx-12.0.0              | h2f01273_0     | 1.1 MB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| pip-22.1.2                 | py37hecd8cb5_0 | 2.9 MB  | https://mirrors.aliyun.com/anaconda/pkgs/main |
| Total:                     |                | 40.9 MB |                                               |



The following NEW packages will be INSTALLED:



|                  |                          |                                               |
|------------------|--------------------------|-----------------------------------------------|
| ca-certificates: | 2022.07.19-hecd8cb5_0    | https://mirrors.aliyun.com/anaconda/pkgs/main |
| certifi:         | 2022.6.15-py37hecd8cb5_0 | https://mirrors.aliyun.com/anaconda/pkgs/main |
| libcxx:          | 12.0.0-h2f01273_0        | https://mirrors.aliyun.com/anaconda/pkgs/main |
| libffi:          | 3.3-hb1e8313_2           | https://mirrors.aliyun.com/anaconda/pkgs/main |
| ncurses:         | 6.3-hca72f7f_3           | https://mirrors.aliyun.com/anaconda/pkgs/main |
| openssl:         | 1.1.1q-hca72f7f_0        | https://mirrors.aliyun.com/anaconda/pkgs/main |
| pip:             | 22.1.2-py37hecd8cb5_0    | https://mirrors.aliyun.com/anaconda/pkgs/main |
| python:          | 3.7.13-hdfd78df_0        | https://mirrors.aliyun.com/anaconda/pkgs/main |
| readline:        | 8.1.2-hca72f7f_1         | https://mirrors.aliyun.com/anaconda/pkgs/main |
| setuptools:      | 63.4.1-py37hecd8cb5_0    | https://mirrors.aliyun.com/anaconda/pkgs/main |
| sqlite:          | 3.39.2-h707629a_0        | https://mirrors.aliyun.com/anaconda/pkgs/main |
| tk:              | 8.6.12-h5d9f67b_0        | https://mirrors.aliyun.com/anaconda/pkgs/main |
| wheel:           | 0.37.1-pyhd3eb1b0_0      | https://mirrors.aliyun.com/anaconda/pkgs/main |
| xz:              | 5.2.5-hca72f7f_1         | https://mirrors.aliyun.com/anaconda/pkgs/main |
| zlib:            | 1.2.12-h4dc903c_2        | https://mirrors.aliyun.com/anaconda/pkgs/main |



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

输入 `y` 即可进行安装。

```
Proceed (y/n)? y
Downloading and Extracting Packages
openssl-1.1.1q 3.5 MB |#####| 100%
tk-8.6.12 3.4 MB |#####| 100%
python-3.7.13 24.7 MB |#####| 100%
c-certificates-2022 131 KB |#####| 100%
setuptools-63.4.1 1.4 MB |#####| 100%
readline-8.1.2 386 KB |#####| 100%
ncurses-6.1 1.1 MB |#####| 100%
wheel-0.37.1 31 KB |#####| 100%
libffi-3.3 45 KB |#####| 100%
sqlite-3.39.2 1.8 MB |#####| 100%
certifi-2022.6.15 121 KB |#####| 100%
xz-5.2.5 272 KB |#####| 100%
zlib-1.2.12 116 KB |#####| 100%
libcxx-11.0 1.1 MB |#####| 100%
pip-22.1.2 2.9 MB |#####| 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
#
# To activate this environment, use
#
# $ conda activate DL
#
# To deactivate an active environment, use
#
# $ conda deactivate
#
```

3) 激活环境

conda activate DL

```
wangye@wangyedeMacBook-Air ~$ conda activate DL
(DL) wangye@wangyedeMacBook-Air ~$
```

在激活命令执行完毕后，可以发现，当前已处于（DL）的环境下。

4) 测试环境是否可用

```
(DL) wangye@wangyedeMacBook-Air ~$ conda activate DL
(DL) wangye@wangyedeMacBook-Air ~$ python
Python 3.7.13 (default, Mar 28 2022, 07:24:34)
[Clang 12.0.0 ] :: Anaconda, Inc. on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> import sys
>>> sys.version
'3.7.13 (default, Mar 28 2022, 07:24:34) \n[Clang 12.0.0 ]'
>>>
```

输入 python 进行解释器中，输入相应代码，出现上述内容，即环境可用。

5) 在当前环境中安装 numpy、pytorch 等 library

安装 numpy

conda install numpy 或者 pip install numpy

```
(DL) wangye@wangyedeMacBook-Air ~$ conda install numpy
Solving environment: done

==> WARNING: A newer version of conda exists. <==
current version: 4.5.11
latest version: 4.14.0

Please update conda by running

    $ conda update -n base -c defaults conda

## Package Plan ##

environment location: /Users/wangye/anaconda3/envs/DL

added / updated specs:
- numpy

The following packages will be downloaded:



| package               | build          | size     | url                                          |
|-----------------------|----------------|----------|----------------------------------------------|
| mkl-2021.4.0          | hecd8cb5_637   | 209.2 MB | https://mirrors.aliyun.com/anaconda/pkg/main |
| mkl_fft-1.3.1         | py37h4ab4a9b_0 | 182 KB   | https://mirrors.aliyun.com/anaconda/pkg/main |
| numpy-1.21.5          | py37h2e5f0a9_3 | 10 KB    | https://mirrors.aliyun.com/anaconda/pkg/main |
| blas-1.0              | mkl            | 5 KB     | https://mirrors.aliyun.com/anaconda/pkg/main |
| mkl_random-1.2.2      | py37hb2f4e1b_0 | 296 KB   | https://mirrors.aliyun.com/anaconda/pkg/main |
| mkl-service-2.4.0     | py37h9ed2024_0 | 47 KB    | https://mirrors.aliyun.com/anaconda/pkg/main |
| numpy-base-1.21.5     | py37h3b1a694_3 | 6.0 MB   | https://mirrors.aliyun.com/anaconda/pkg/main |
| six-1.16.0            | pyhd3eb1b0_1   | 19 KB    | https://mirrors.aliyun.com/anaconda/pkg/main |
| intel-openmp-2021.4.0 | hecd8cb5_3538  | 1.2 MB   | https://mirrors.aliyun.com/anaconda/pkg/main |
| Total:                |                | 216.9 MB |                                              |



The following NEW packages will be INSTALLED:

blas: 1.0-mkl https://mirrors.aliyun.com/anaconda/pkg/main
intel-openmp: 2021.4.0-hecd8cb5_3538 https://mirrors.aliyun.com/anaconda/pkg/main
mkl: 2021.4.0-hecd8cb5_637 https://mirrors.aliyun.com/anaconda/pkg/main
mkl-service: 2.4.0-py37h9ed2024_0 https://mirrors.aliyun.com/anaconda/pkg/main
mkl_fft: 1.3.1-py37h4ab4a9b_0 https://mirrors.aliyun.com/anaconda/pkg/main
mkl_random: 1.2.2-py37hb2f4e1b_0 https://mirrors.aliyun.com/anaconda/pkg/main
numpy: 1.21.5-py37h2e5f0a9_3 https://mirrors.aliyun.com/anaconda/pkg/main
numpy-base: 1.21.5-py37h3b1a694_3 https://mirrors.aliyun.com/anaconda/pkg/main
six: 1.16.0-pyhd3eb1b0_1 https://mirrors.aliyun.com/anaconda/pkg/main

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

检查安装是否成功

```
(DL) wangye@wangyedeMacBook-Air ~$ python
Python 3.7.13 (default, Mar 28 2022, 07:24:34)
[Clang 12.0.0] :: Anaconda, Inc. on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> import numpy as np

>>>
>>> np.ones(1)
array([1.])
>>>
```

输入 python 进入解释器，然后导入 numpy，并输出数组。

安装 pytorch

访问 <https://pytorch.org/get-started/locally/>

选择CPU版本，根据官方提供的命令进行下载，Conda方式和Pip下载方式均可

START LOCALLY

Select your preferences and run the install command. Stable represents the most currently tested and supported version of PyTorch. This should be suitable for many users. Preview is available if you want the latest, not fully tested and supported, builds that are generated nightly. Please ensure that you have **met the prerequisites below (e.g., numpy)**, depending on your package manager. Anaconda is our recommended package manager since it installs all dependencies. You can also **install previous versions of PyTorch**. Note that LibTorch is only available for C++.

PyTorch Build	Stable (2.0.1)		Preview (Nightly)	
Your OS	Linux	Mac	Windows	
Package	Conda	Pip	LibTorch	Source
Language	Python		C++ / Java	
Compute Platform	CUDA 11.7	CUDA 11.8	ROCm 5.4.2	CPU
Run this Command:	conda install pytorch torchvision torchaudio cpuonly -c pytorch			

PyTorch Build	Stable (2.0.1)		Preview (Nightly)	
Your OS	Linux	Mac	Windows	
Package	Conda	Pip	LibTorch	Source
Language	Python		C++ / Java	
Compute Platform	CUDA 11.7	CUDA 11.8	ROCm 5.4.2	CPU
Run this Command:	pip3 install torch torchvision torchaudio			

```
(dlw) C:\Users\Spb>pip3 install torch torchvision torchaudio
Looking in indexes: https://pypi.tuna.tsinghua.edu.cn/simple
Collecting torch
  Using cached https://pypi.tuna.tsinghua.edu.cn/packages/b1/85/62b8da9d984ae95f6fdda707df4af6552a5cea46fde2b944223daf236524/torch-1.13.1-cp37-cp37m-win_amd64.whl (162.6 MB)
Collecting torchvision
  Using cached https://pypi.tuna.tsinghua.edu.cn/packages/77/ec/ccdfcaf958f6007cc357ce12fd945551a71503b88cd3f78e49fd958f949/torchvision-0.14.1-cp37-cp37m-win_amd64.whl (1.1 MB)
Collecting torchaudio
  Using cached https://pypi.tuna.tsinghua.edu.cn/packages/01/66/0b5689b4a26255b23bf899d9ae016b04d9ea244e944b8010a71fe5f500ff/torchaudio-0.13.1-cp37-cp37m-win_amd64.whl (2.0 MB)
Collecting typing-extensions (from torch)
  Downloading https://pypi.tuna.tsinghua.edu.cn/packages/ec/6b/63cc3df74987c36fe26157ee12e09e8f9db4de771e0f3404263117e75b95/typing_extensions-4.7.1-py3-none-any.whl (33 kB)
Collecting numpy (from torchvision)
  Using cached https://pypi.tuna.tsinghua.edu.cn/packages/97/9f/da37cc4a188a1d5d203d65ab28d6504e17594b5342e0c1dc5610ee6f4535/numpy-1.21.6-cp37-cp37m-win_amd64.whl (14.0 MB)
Collecting requests (from torchvision)
  Downloading https://pypi.tuna.tsinghua.edu.cn/packages/70/8e/0e2d847013cb52cd35b38c009bb167a1a26b2ce6cd6965bf26b47bc0bf44/request-2.31.0-py3-none-any.whl (62 kB)
```


检测是否安装成功

```
(dl4) C:\Users\Spb>python
Python 3.7.12 | packaged by conda-forge | (default, Oct 26 2021, 05:35:01) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> import torch
>>> torch.__version__
'1.13.1+cpu'
```

输入上述代码，如果能够正常输出 `pytorch` 的版本信息，即表示安装成功。注意：版本号不一定和图上一致（如果安装时不指定版本号时，默认安装官方提供的最新的稳定 `pytorch` 版本），只需要能够正确输出即可。

通过上述的命令行演示，你便可以通过 `conda install` 命令去安装你所需要的包。例如：
`conda install pillow` 等等。非常便捷。

注意：上述所有关于 `conda` 的命令，都是在 DL 这个环境下运行的，那么也只有在 DL 这个环境中才能使用！

7) 根据需要，可以安装多个 conda 环境（例如不同 python 版本，不同 pytorch 版本的环境）

比如创建一个名字为 DL_1，python 版本为 3.6 的 conda 环境：

```
wangye@wangyedeMacBook-Air ~$ conda create -n DL_1 python=3.6
solving environment: done

==> WARNING: A newer version of conda exists. <==
current version: 4.5.11
latest version: 4.14.0

Please update conda by running

    $ conda update -n base -c defaults conda

# Package Plan ##

environment location: /Users/wangye/anaconda3/envs/DL_1

added / updated specs:
- python=3.6

The following packages will be downloaded:

package | build | size | channel
-----|-----|-----|-----
libffi-3.3 | hb1e8313_2 | 48 KB | defaults
libcxx-12.0.0 | h2f01273_0 | 1.1 MB | defaults
python-3.6.13 | h88f2d9e_0 | 20.3 MB | defaults
tk-8.6.12 | h5d9f67b_0 | 3.4 MB | defaults
pip-21.2.2 | py36hecd8cb5_0 | 2.1 MB | defaults
setuptools-58.0.4 | py36hecd8cb5_0 | 970 KB | defaults
certifi-2021.5.30 | py36hecd8cb5_0 | 141 KB | defaults
ncurses-6.3 | hca72f7f_3 | 1.1 MB | defaults
wheel-0.37.1 | pyhd3eb1b0_0 | 31 KB | defaults
sqlite-3.39.2 | h707629a_0 | 1.8 MB | defaults
readline-8.1.2 | hca72f7f_1 | 390 KB | defaults
xz-5.2.5 | hca72f7f_1 | 272 KB | defaults
zlib-1.2.12 | h4dc903c_2 | 116 KB | defaults

Total: 31.7 MB

The following NEW packages will be INSTALLED:

ca-certificates: 2022.07.19-hecd8cb5_0 defaults
certifi: 2021.5.30-py36hecd8cb5_0 defaults
libcxx: 12.0.0-h2f01273_0 defaults
libffi: 3.3-hb1e8313_2 defaults
ncurses: 6.3-hca72f7f_3 defaults
openssl: 1.1.1q-hca72f7f_0 defaults
pip: 21.2.2-py36hecd8cb5_0 defaults
python: 3.6.13-h88f2d9e_0 defaults
readline: 8.1.2-hca72f7f_1 defaults
setuptools: 58.0.4-py36hecd8cb5_0 defaults
sqlite: 3.39.2-h707629a_0 defaults
tk: 8.6.12-h5d9f67b_0 defaults
wheel: 0.37.1-pyhd3eb1b0_0 defaults
xz: 5.2.5-hca72f7f_1 defaults
zlib: 1.2.12-h4dc903c_2 defaults

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

输入 y 完成安装。

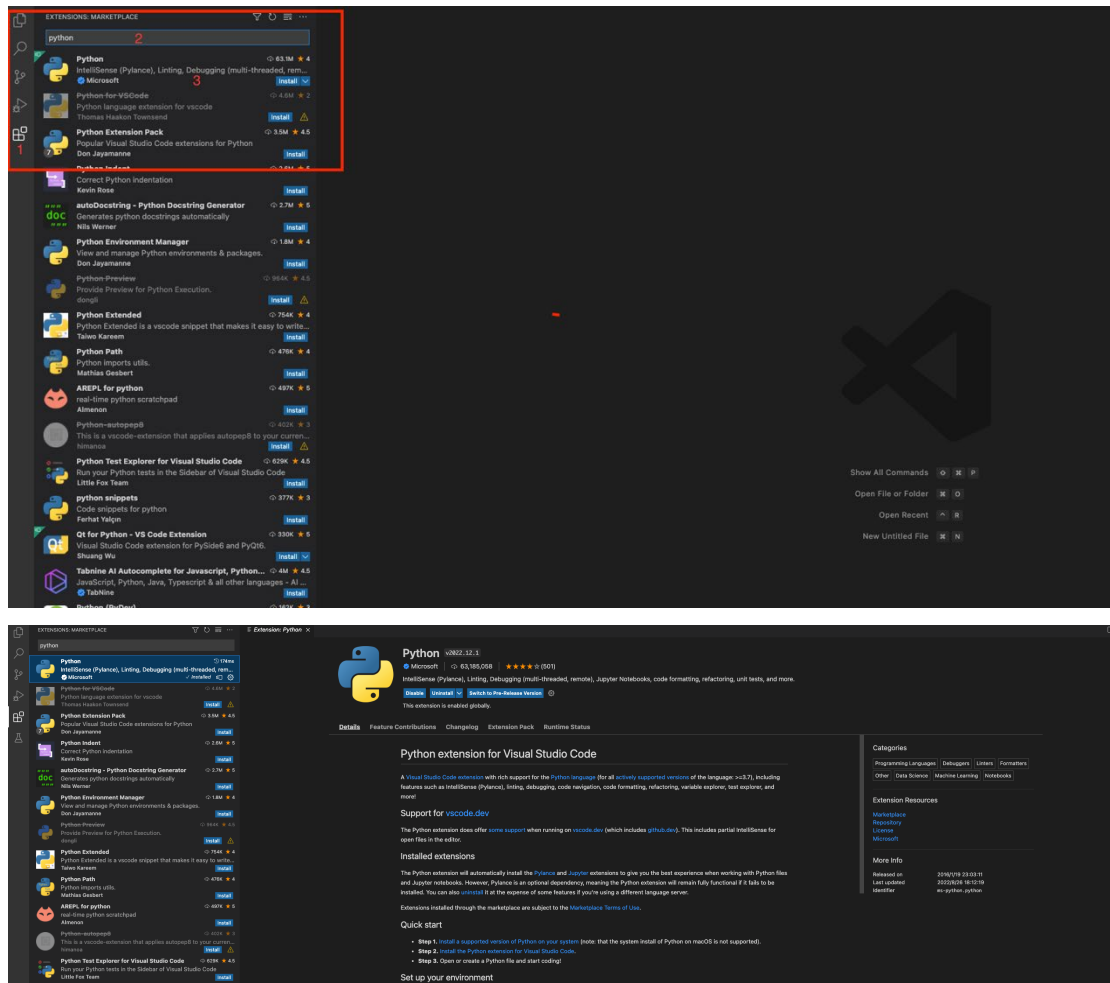
查看所有的 conda 环境信息

```
wangye@wangyedeMacBook-Air ~$ conda info -e
# conda environments:
#
base * /Users/wangye/anaconda3
DL /Users/wangye/anaconda3/envs/DL
DL_1 /Users/wangye/anaconda3/envs/DL_1
```

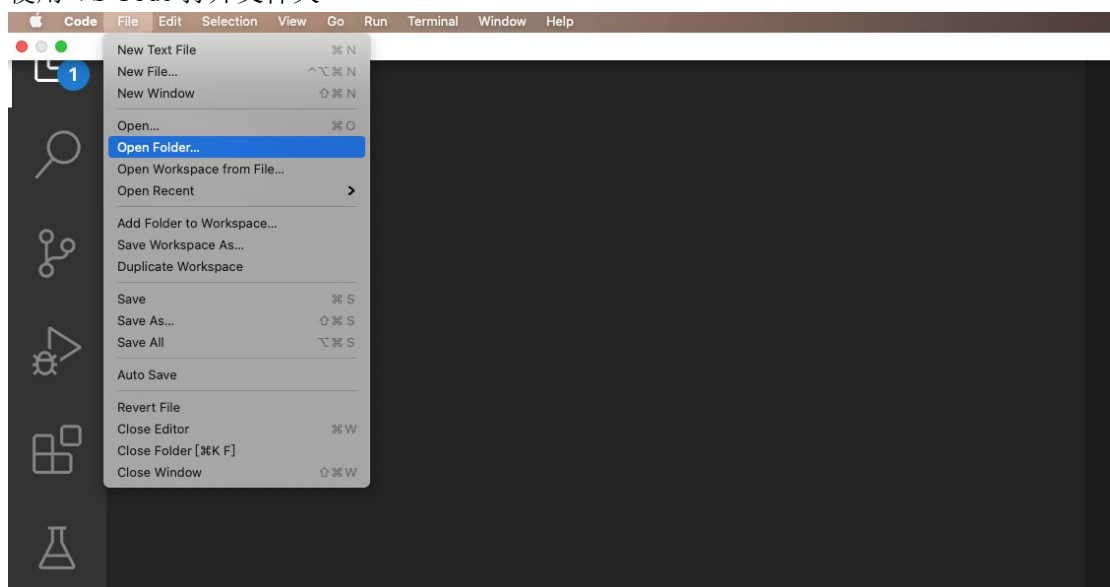
可以看到，目前我们共安装了 DL、DL_1 两个环境，base 是基环境，安装 conda 后自动创建的。

4. 使用 VS Code 集成 Conda 环境，并编写 python 及深度学习代码

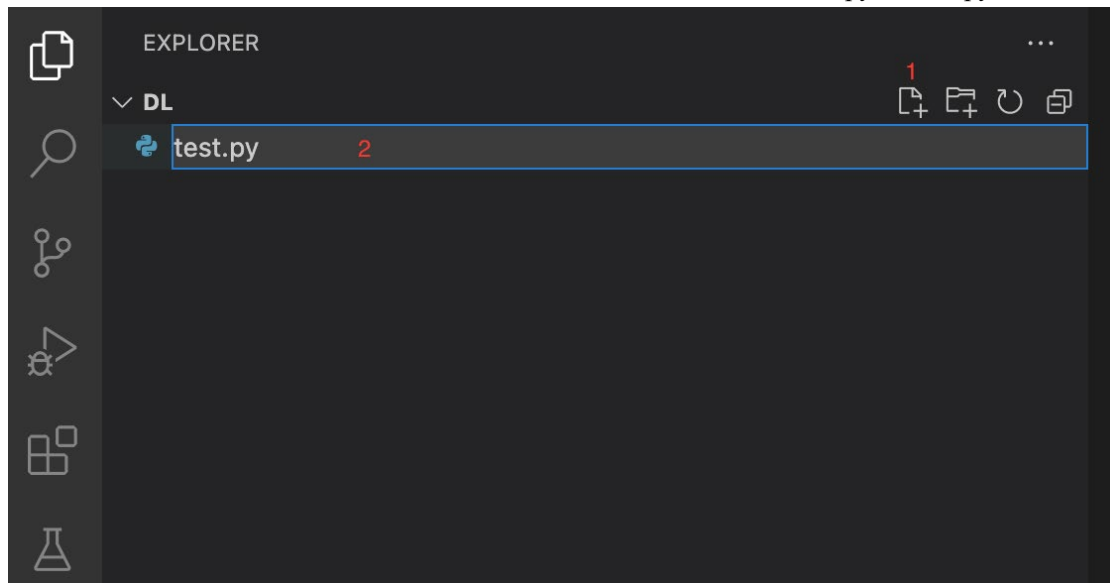
1) 在 VS Code 中安装 python 插件：打开 VS Code，点击左侧边栏红色 1 扩展按钮，在红色 2 区域输入 python，安装红色 3 所示的 python 解释器插件。



使用 VS Code 打开文件夹



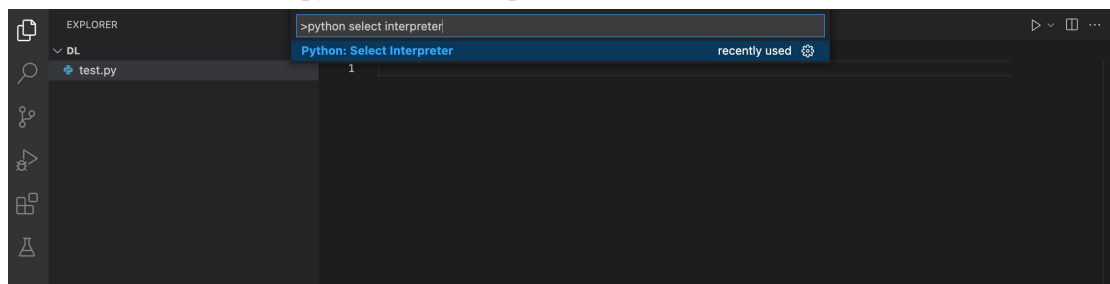
在已打开的文件夹中点击红色 1 创建文件，在红色 2 区域内输入 test.py，新建 python 文件



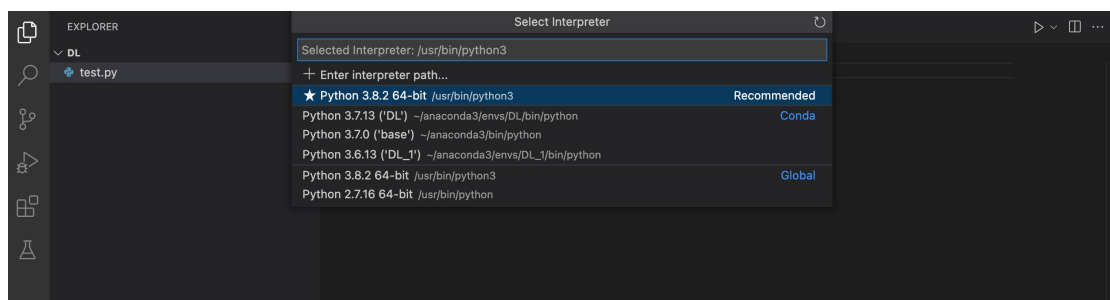
2) 更换 python 解释环境

windows 输入 Ctrl+Shift+p, Mac 输入 comand+shift+p

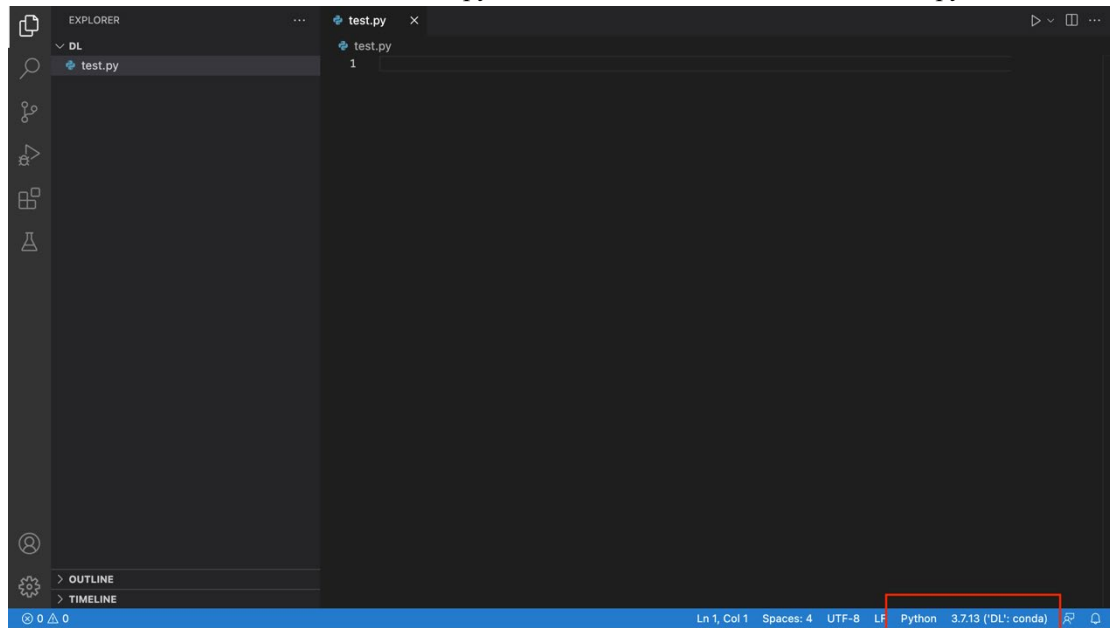
在弹出的输入框内输入 python select interpreter。



选择下面出现的 python3.7.13 ('DL')环境



在右下角的红色矩形框内，发现当前 python 解释器已经切换到了 DL 环境，python 3.7。



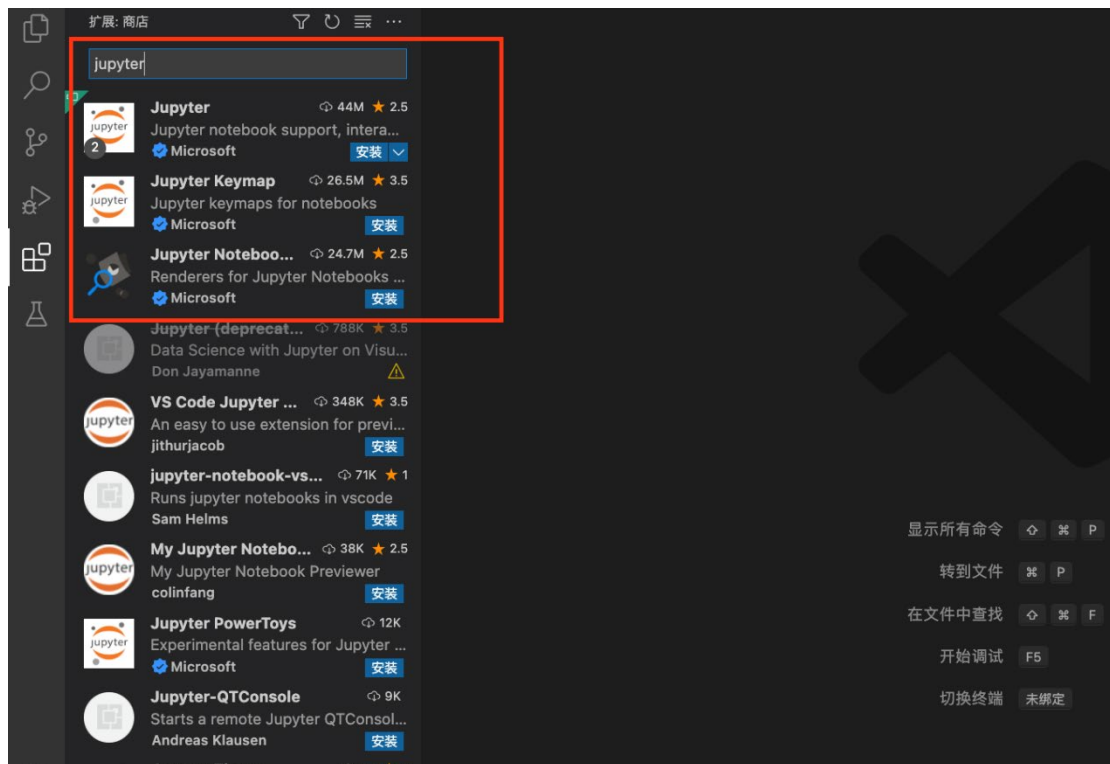
3) 编写代码进行测试



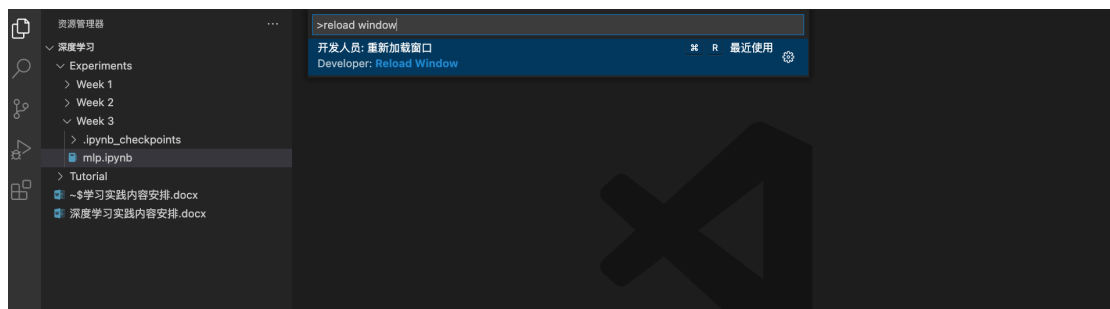
在代码区编写上述代码，点击右上角红色 1 处按钮运行代码，运行结果将出现在下部的输出区。

5. 在 VS Code 中使用 Jupyter notebook 编写代码

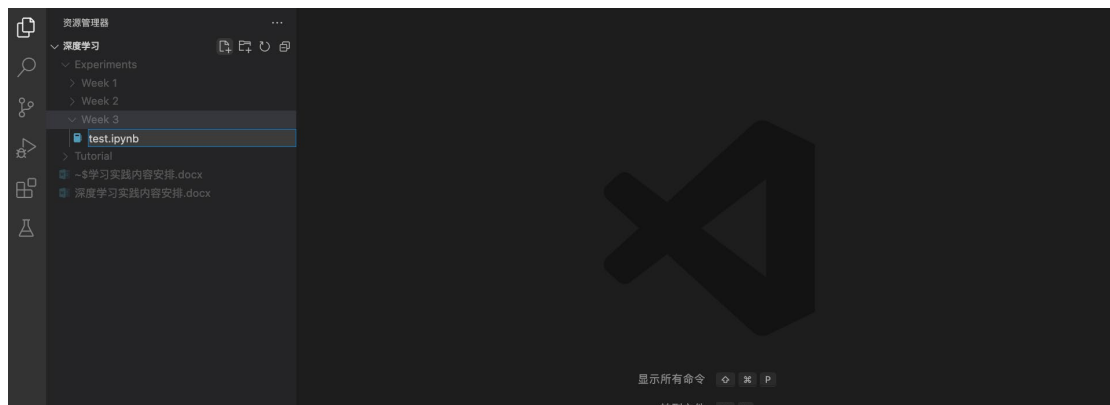
1) 安装 jupyter 插件



MacOS 用户 Command+Shift+P, 并输入 reload window, 重新加载 VS Code
Windows 用户输入 Ctrl+Shift+P, 并输入 reload window, 重新加载 VS Code



2) 新建 ipynb 代码文件



编写相关代码进行测试

点击右上方按钮，切换至当前 DL 环境下。

当完成一个代码框的代码编写后，按 Shift+Enter 进行执行。

