





吳老師教學中心



Python程式語言,大數據,人工智慧,
機器學習,深度學習

- 吳老師教學中心粉絲團
- www.facebook.com/chaiyenwu/
- 吳老師教學會員中心
- <http://www.justinwu.com.tw/>
- 智慧手機App應用程式,iOS,Android.人工智慧,Fintech,大數據，Python, 討論區
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python 機器學習





Python 機器學習

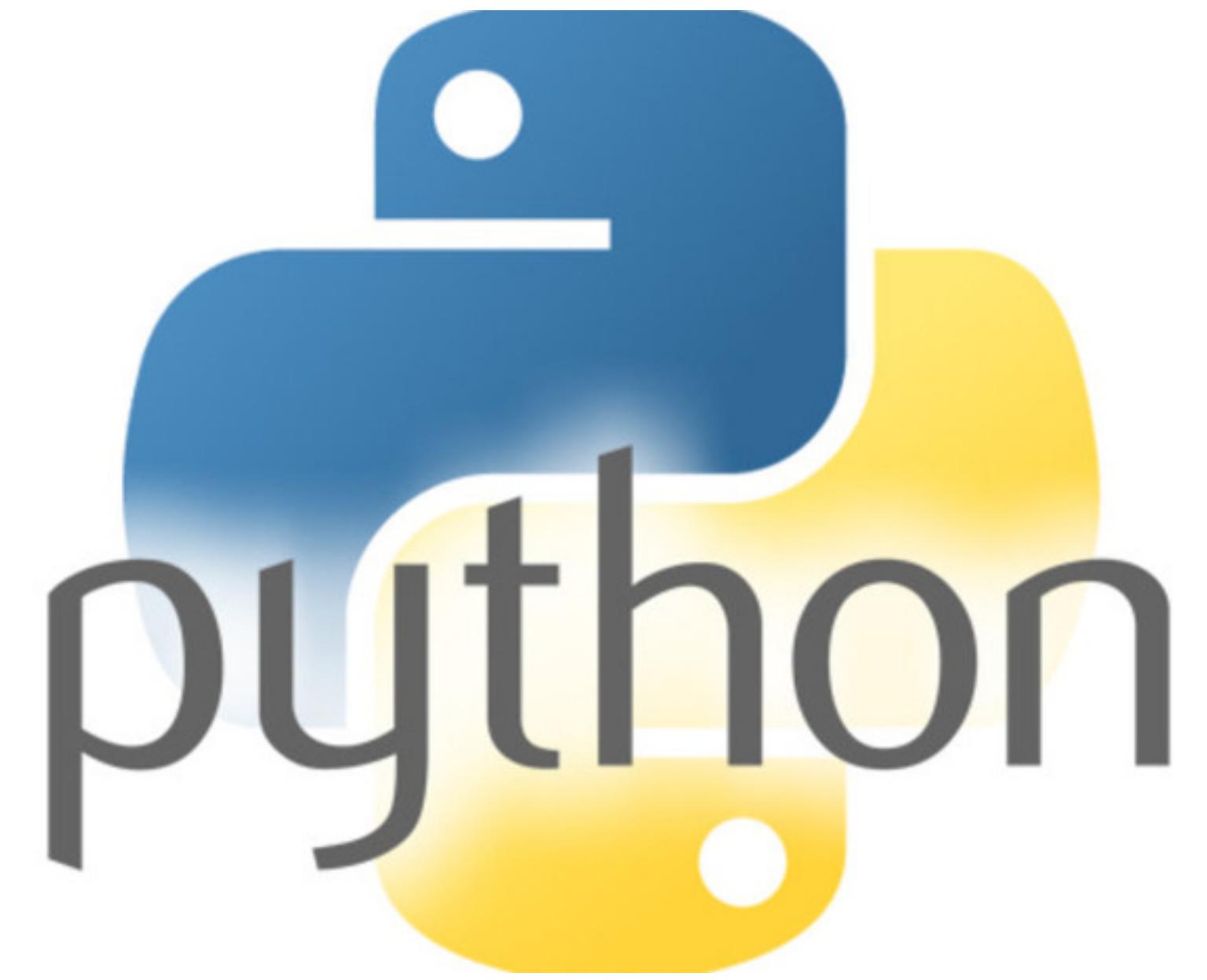
下載及安裝Python軟體

吳佳諺 老師





1. 下載及安裝Python軟體
2. Python直譯器與計算機
3. 資料結構
4. 控制結構
5. 函數
6. 類別
7. 繼承
8. 異常或錯誤處理
9. 使用matplotlib畫圖
10. 網站擷取使用Python
11. 行程和執行緒
12. 資料及檔案處理
13. SQLite資料庫
14. 人機界面及影像處理
15. Python遊戲設計



1. 下載及安裝Python軟體

1-1. 在Mac下載及安裝Python軟體

1-2. 在Window 10下載及安裝Python軟體

1-3. 下載及安裝PyCharm



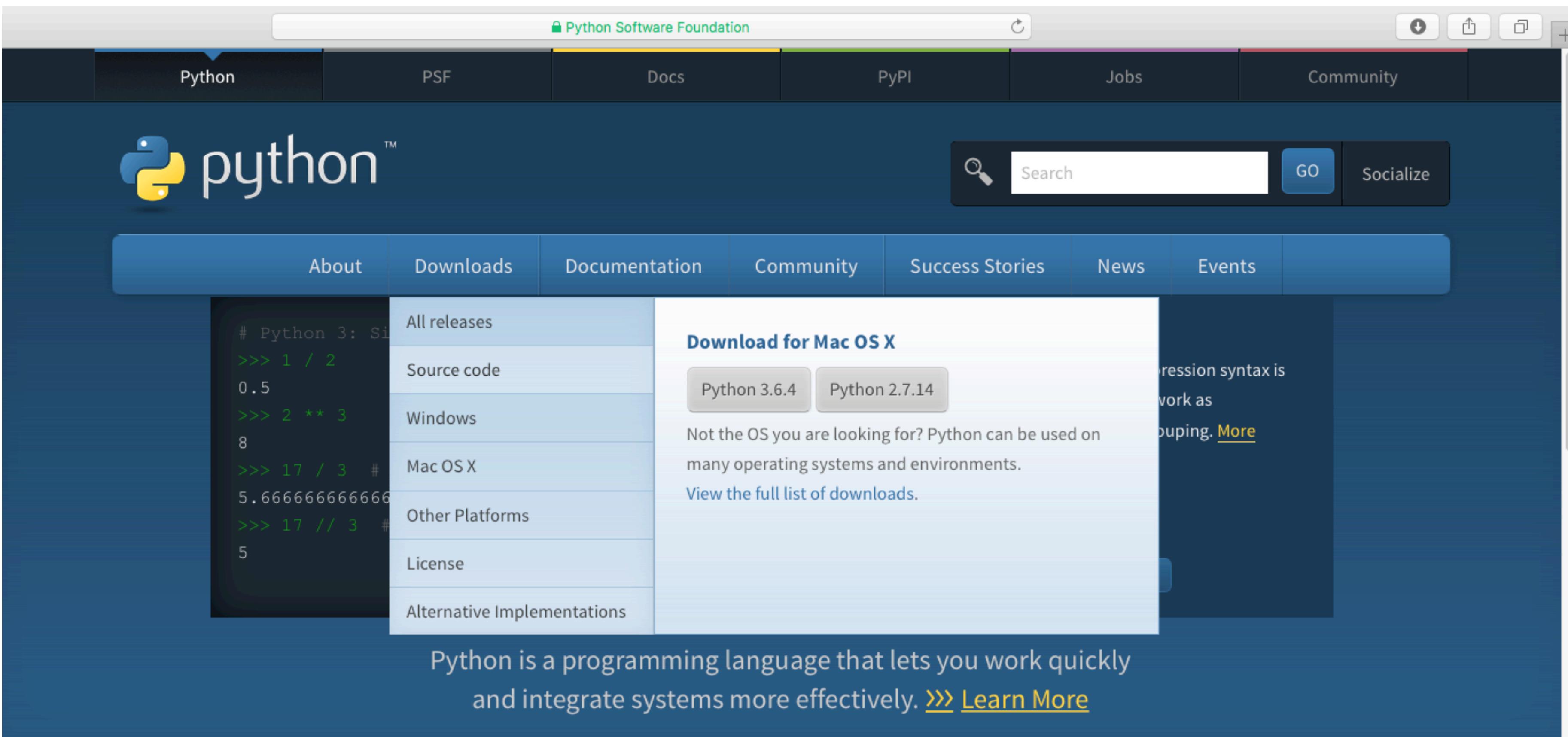
1-1.在Mac下載及安裝Python軟體

到python.org下載軟體

到Anaconda下載Python組合

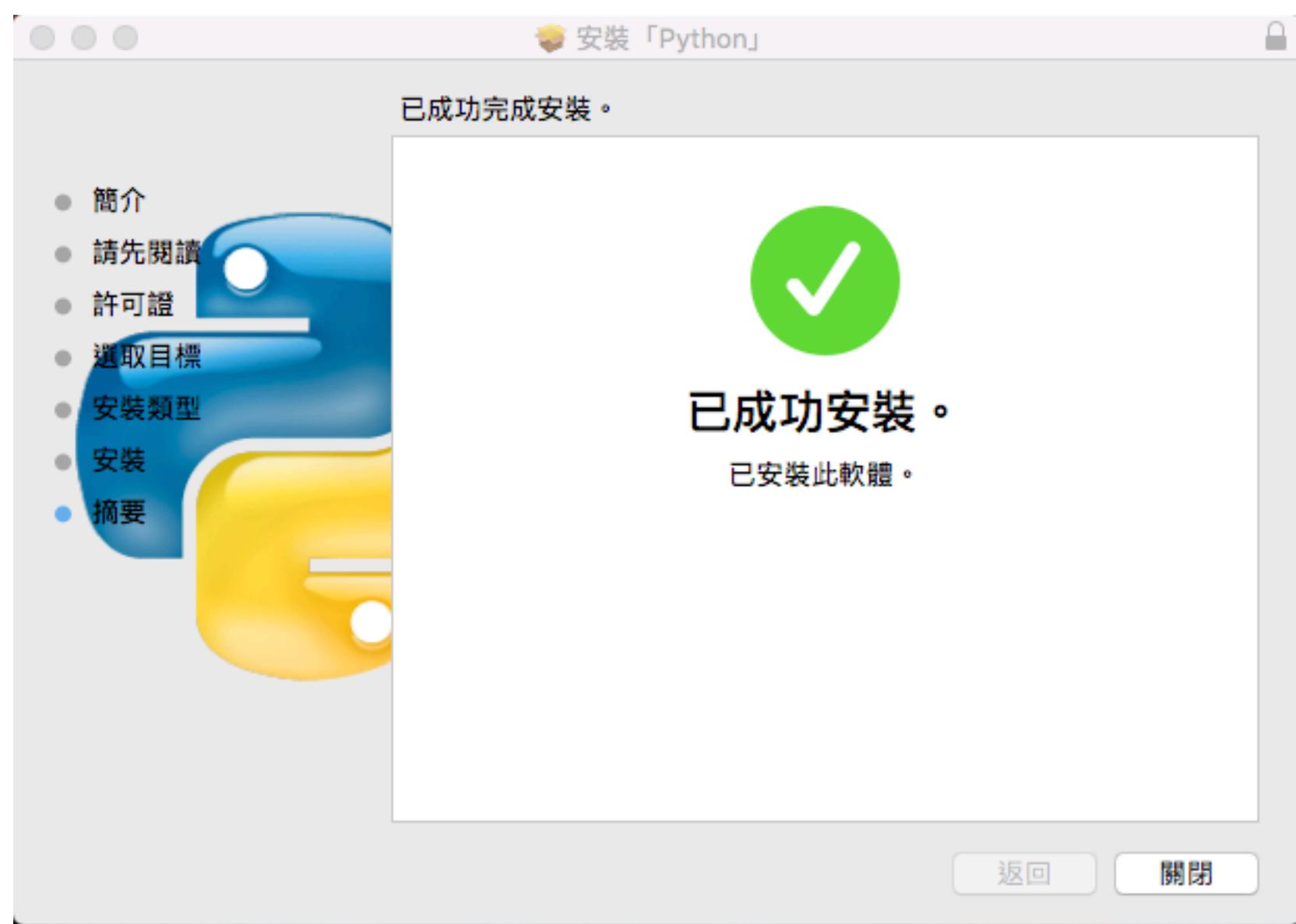


到python.org下載軟體



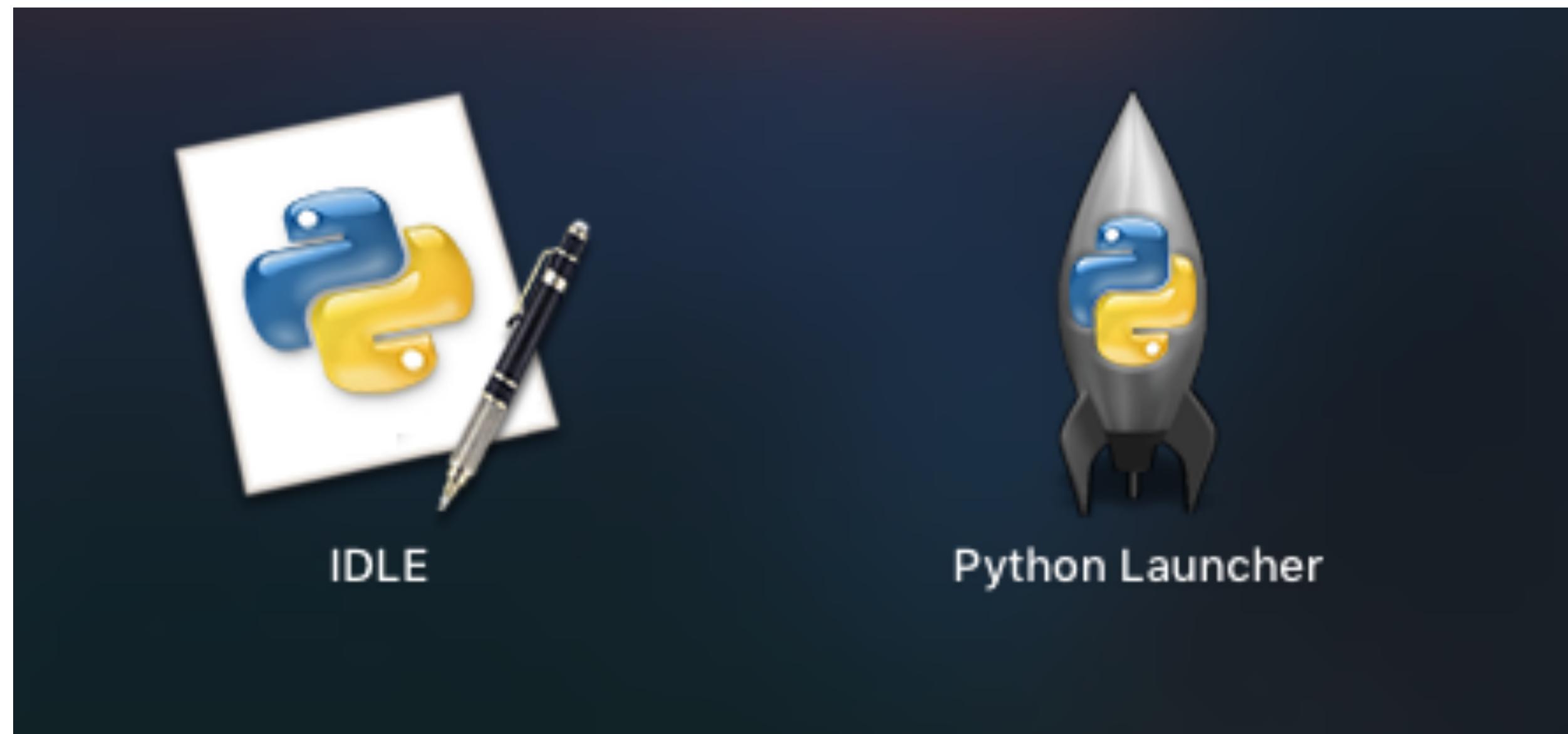
在Mac安裝Python



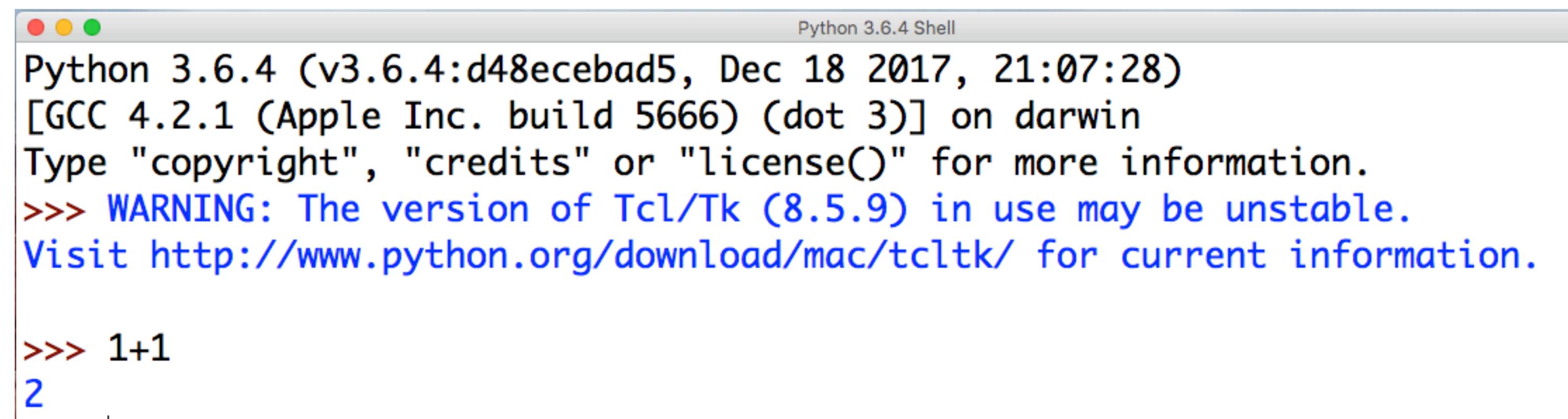


Python安裝

- 這是在Mac上安裝完的Python Launcher



這是安裝完Python的直譯環境



```
Python 3.6.4 (v3.6.4:d48ecebad5, Dec 18 2017, 21:07:28)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "copyright", "credits" or "license()" for more information.
>>> WARNING: The version of Tcl/Tk (8.5.9) in use may be unstable.
Visit http://www.python.org/download/mac/tcltk/ for current information.

>>> 1+1
2
```

使用pip install 套件名稱

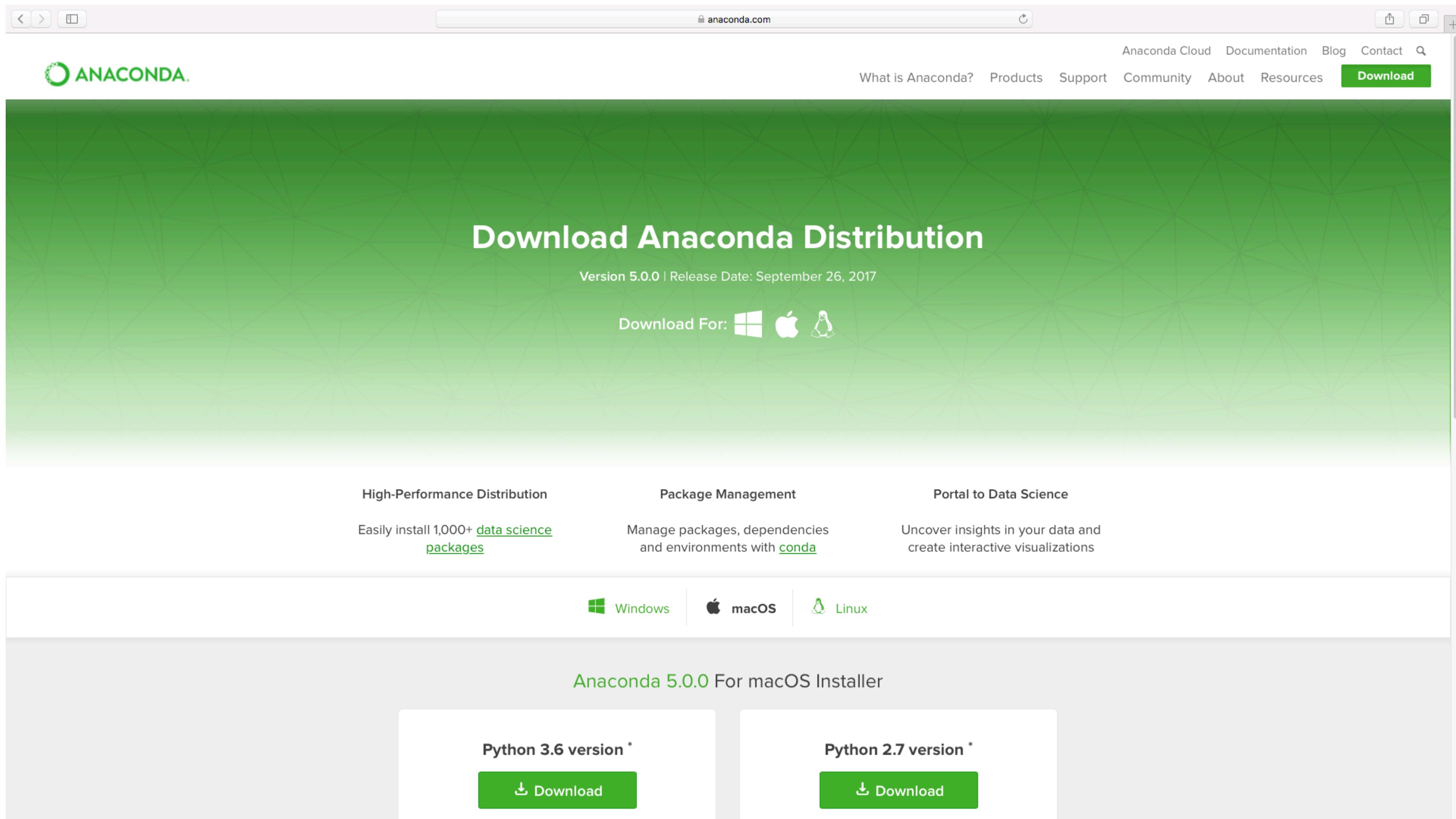
- 安裝套件
- pip install 套件名稱
- 解除安裝套件
- pip uninstall 套件名稱
- 檢視目前系統已經安裝的套件
- pip list

安裝

Anaconda,Numpy,Matplotlib

- 安裝Anaconda組合包
- 此包含Python,spyder,和科學大數據計算軟體
- 安裝Numpy,Matplotlib,Scipy

- 到Anaconda下載Python組合包<https://www.anaconda.com/>



使用conda升級套件

```
Last login: Mon Oct 16 07:12:00 on console
[60-250-191-81:~ justinwu$ pip install scipy
Requirement already satisfied: scipy in ./anaconda3/lib/python3.6/site-packages
[60-250-191-81:~ justinwu$ pip install -U scipy
Requirement already up-to-date: scipy in ./anaconda3/lib/python3.6/site-packages
[60-250-191-81:~ justinwu$ conda install numpy
Fetching package metadata .....
Solving package specifications: .

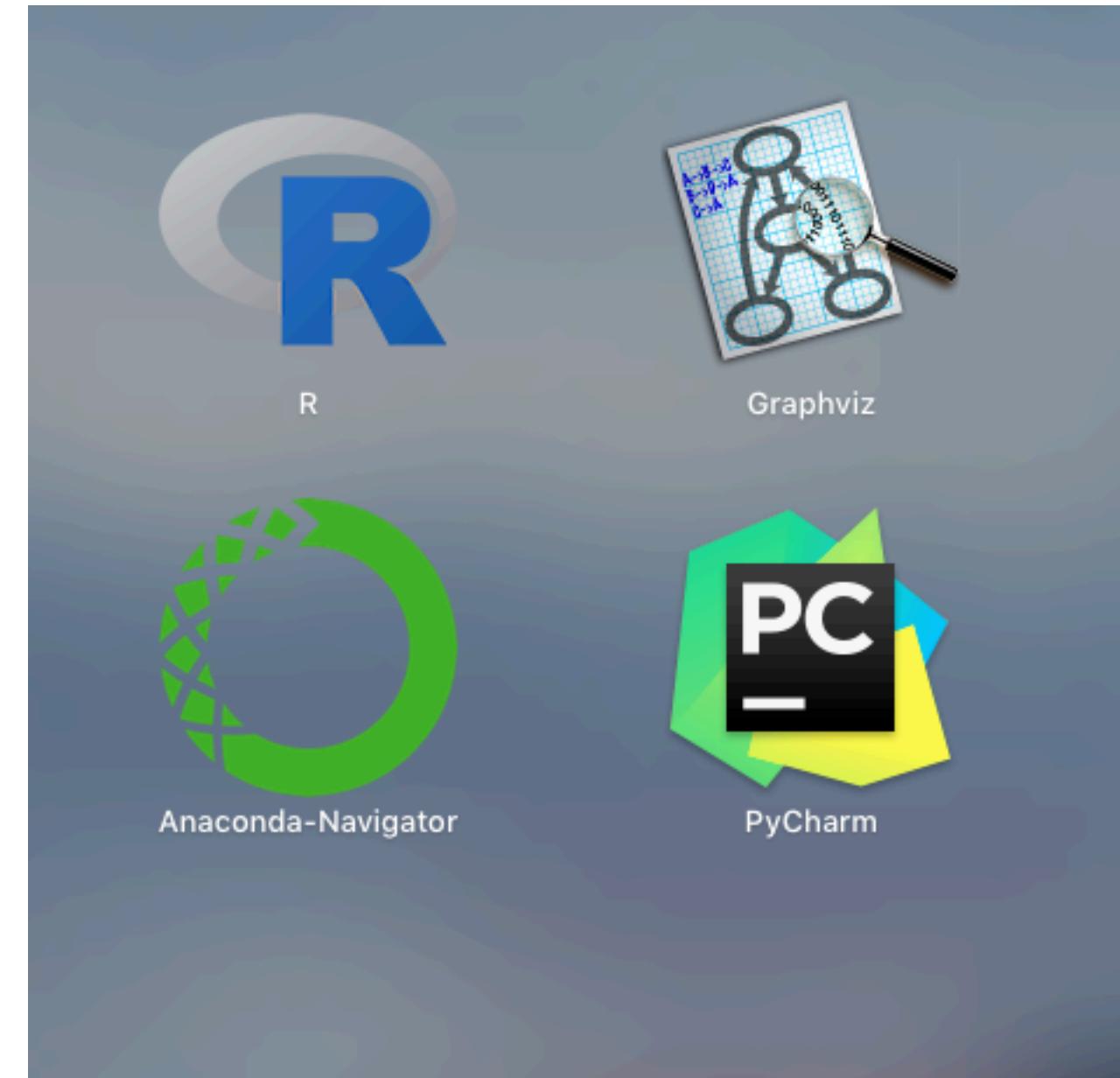
Package plan for installation in environment /Users/justinwu/anaconda3:

The following packages will be UPDATED:

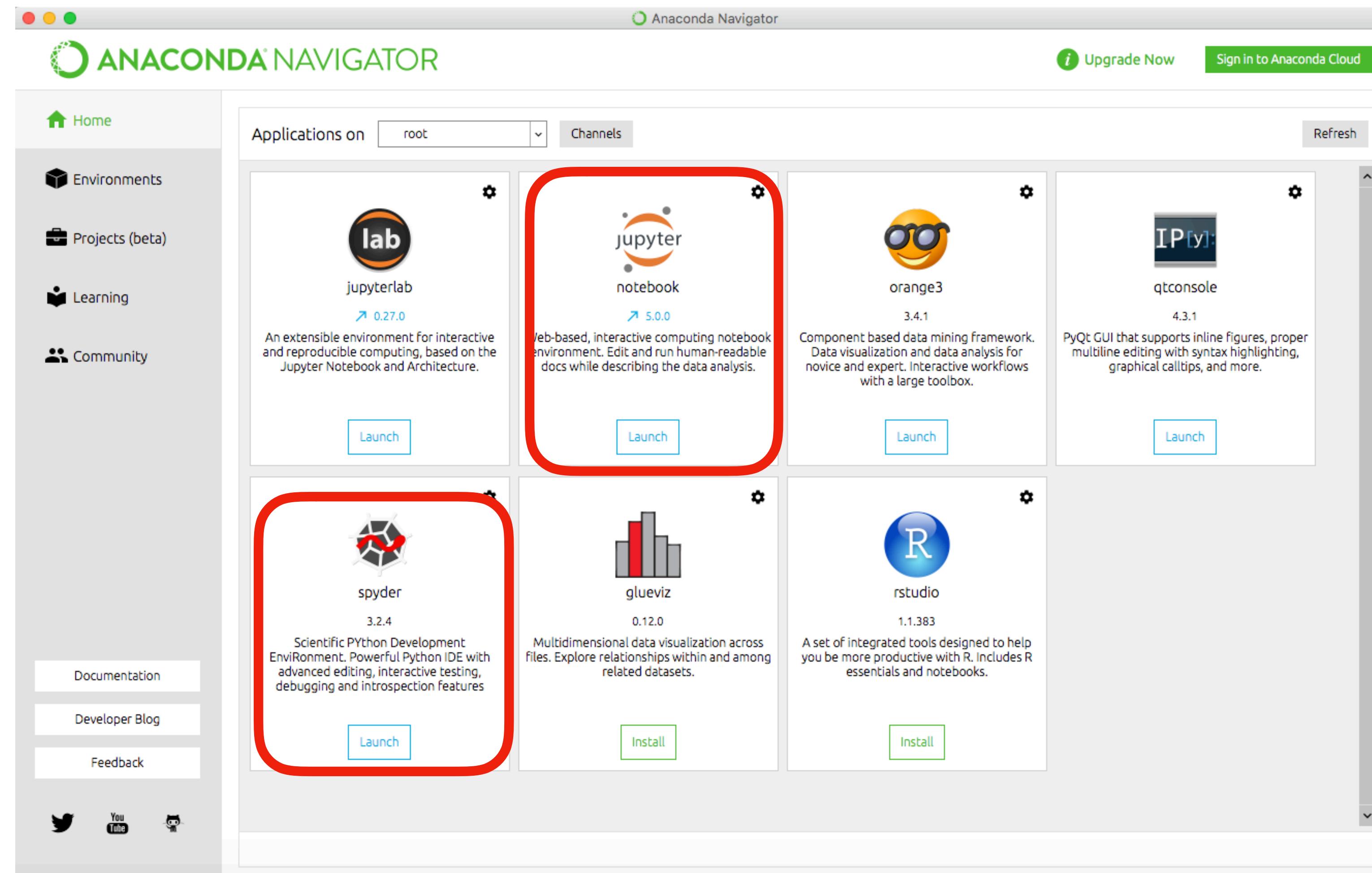
  anaconda: 5.0.0-py36hd9bc8a5_0 --> custom-py36_0
    numpy:    1.13.1-py36h93d791d_2 --> 1.13.3-py36h2cdce51_0

Proceed ([y]/n)?
anaconda-custo 100% [########################################] Time: 0:00:00 238.23 kB/s
numpy-1.13.3-p 100% [########################################] Time: 0:00:00 11.34 MB/s
60-250-191-81:~ justinwu$ ]
```

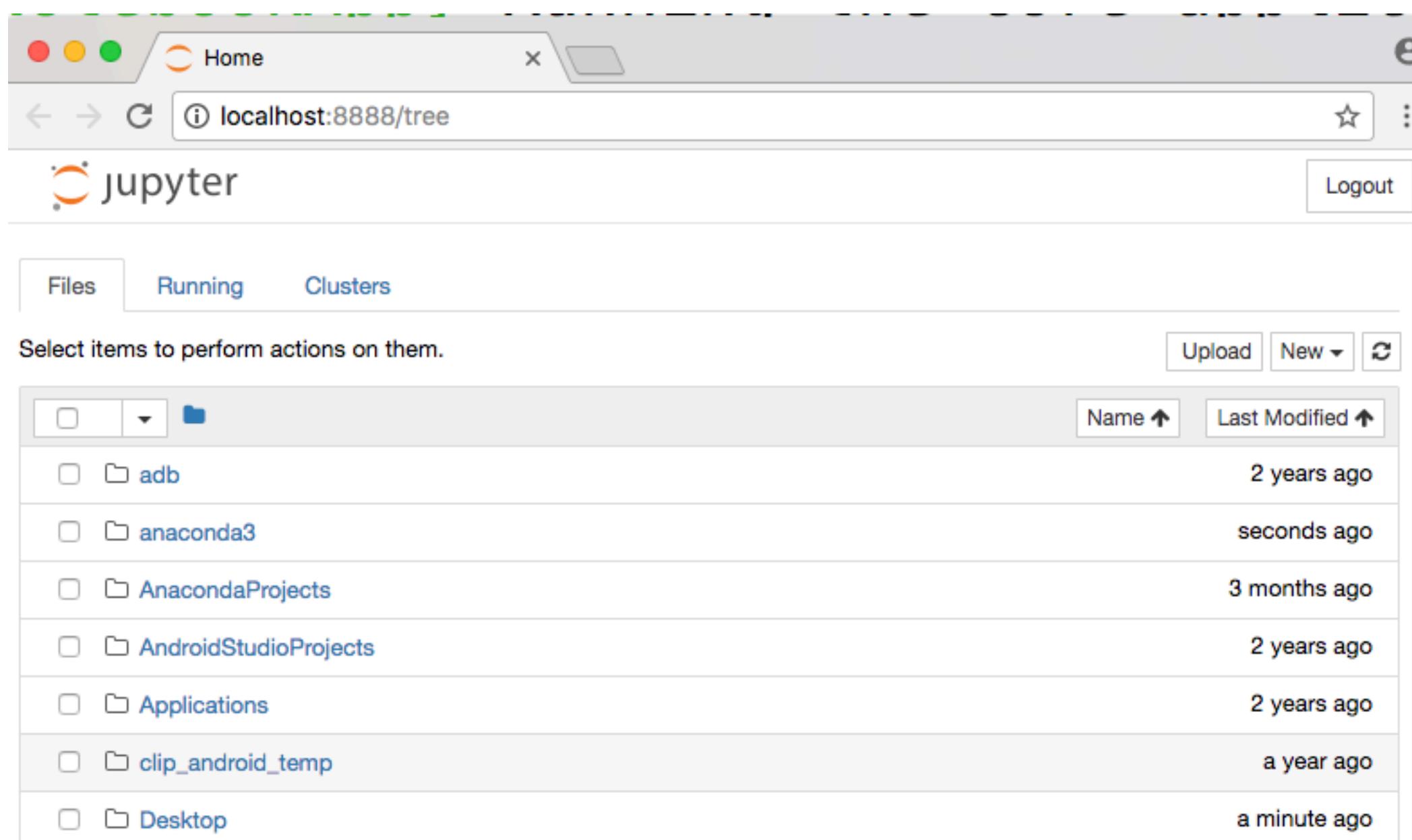
在Mac選取Launchpad打開 Anaconda Navigator



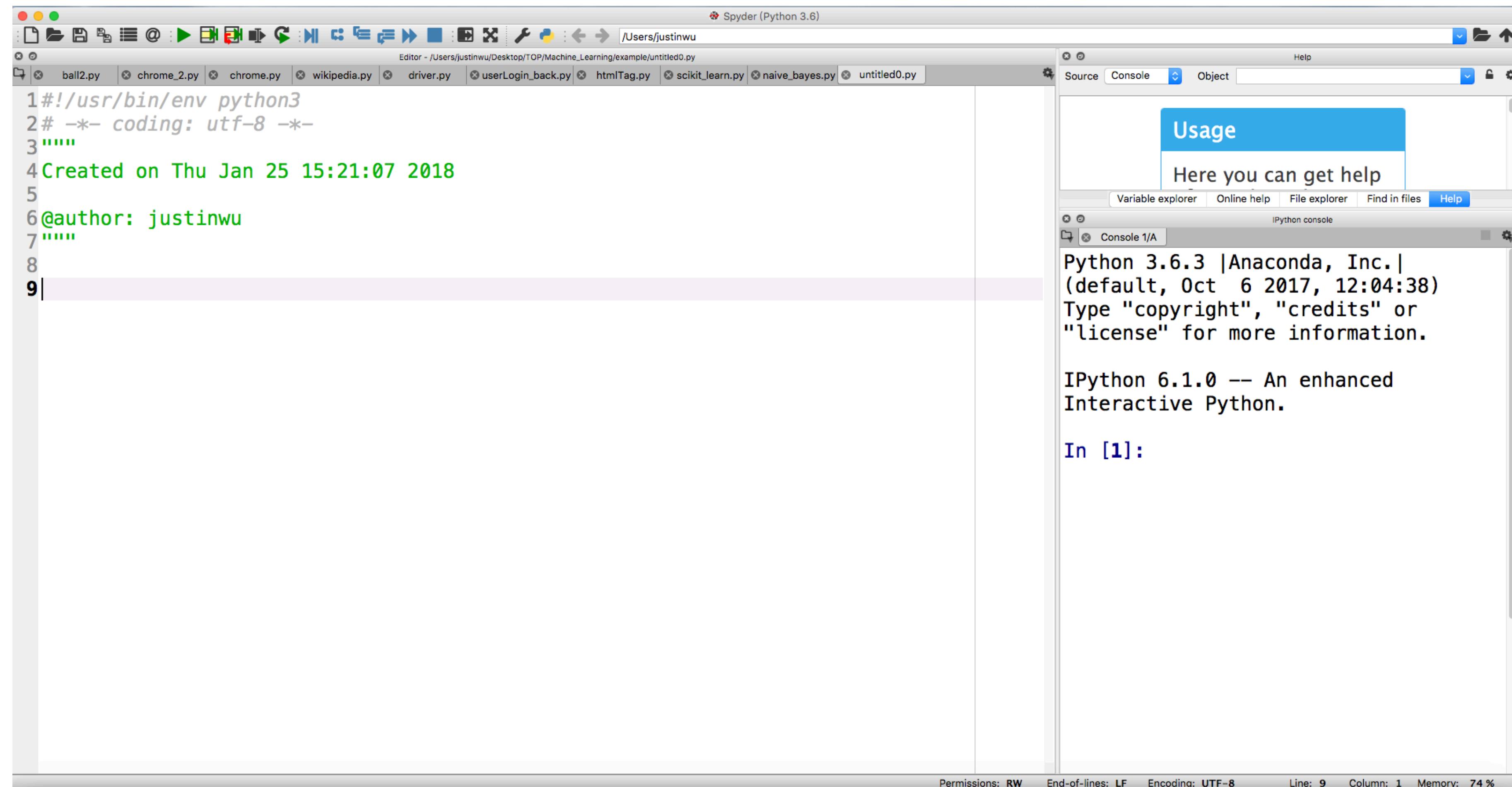
在Mac可以選取Spyder或jupyter notebook來執行



這是安裝的Jupyter Notebook



spyder



1-2.在Window 10下載及安裝Python軟體

- 1-2-1在Window 10下載及安裝Python軟體
- 1-2-2在Windows 10安裝Anaconda



1-2-1在Window 10

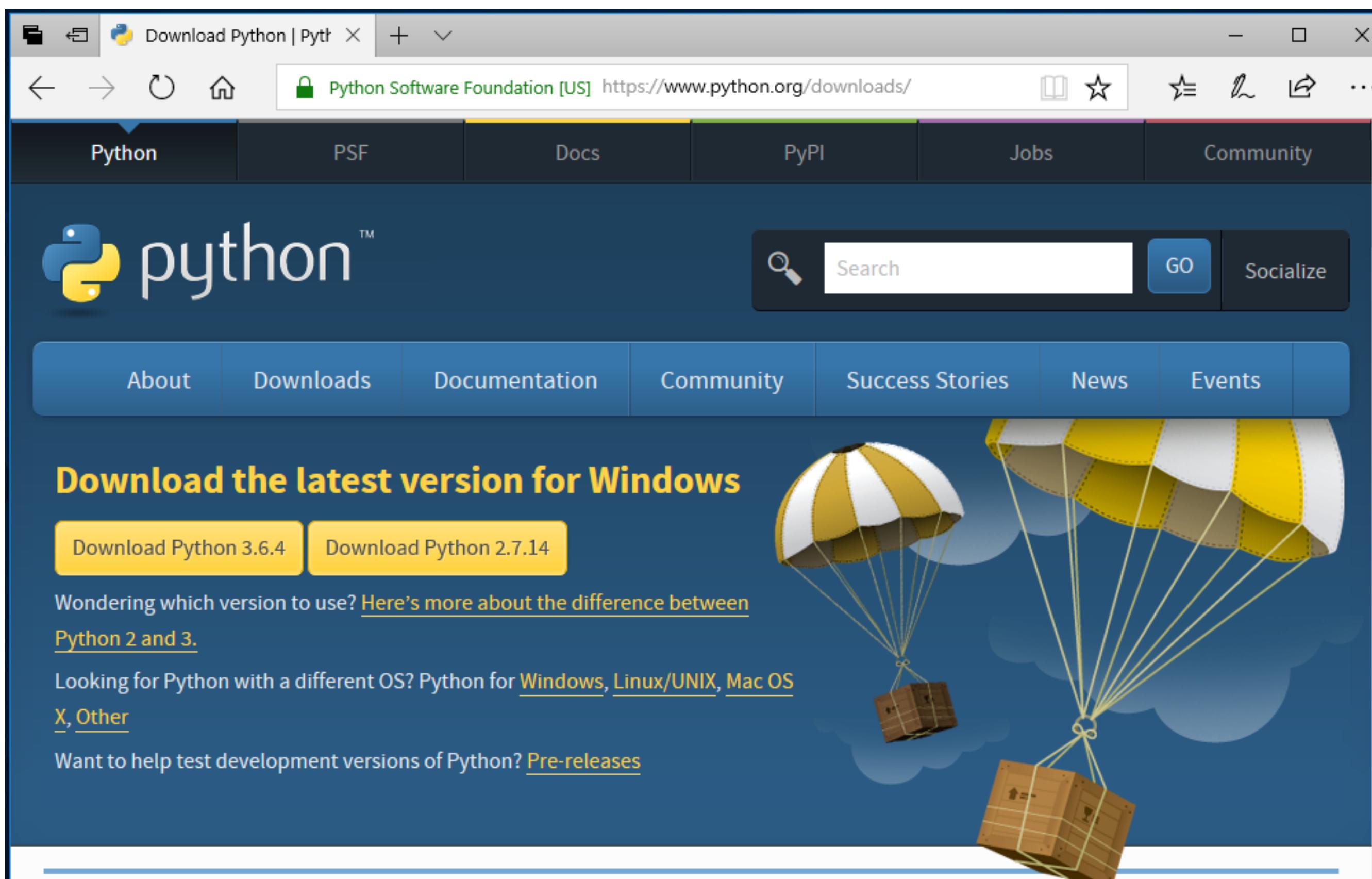
下載及安裝Python軟體

到[python.org](https://www.python.org)下載軟體



到python.org下載軟體

- 下載最新Python3.6版

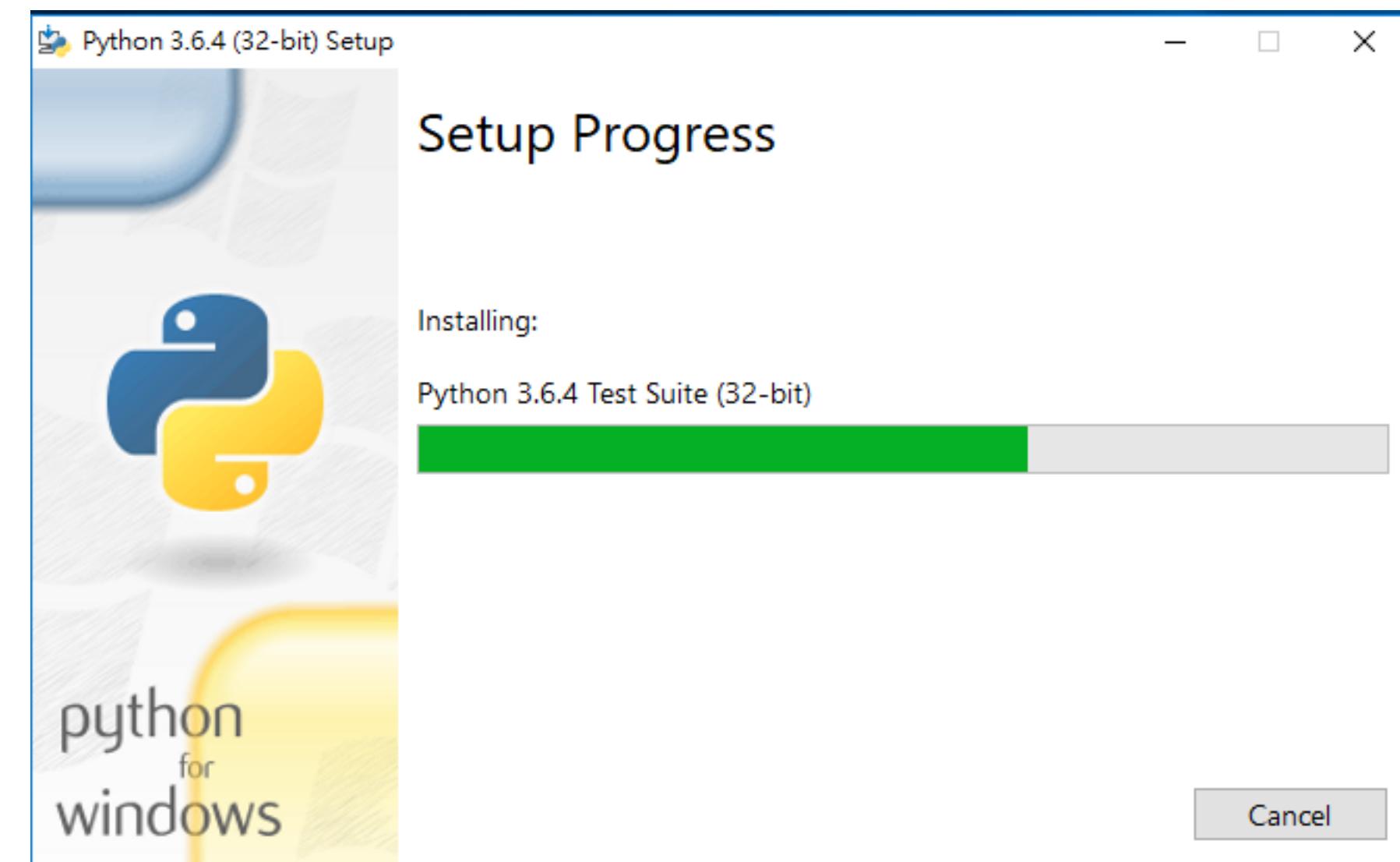


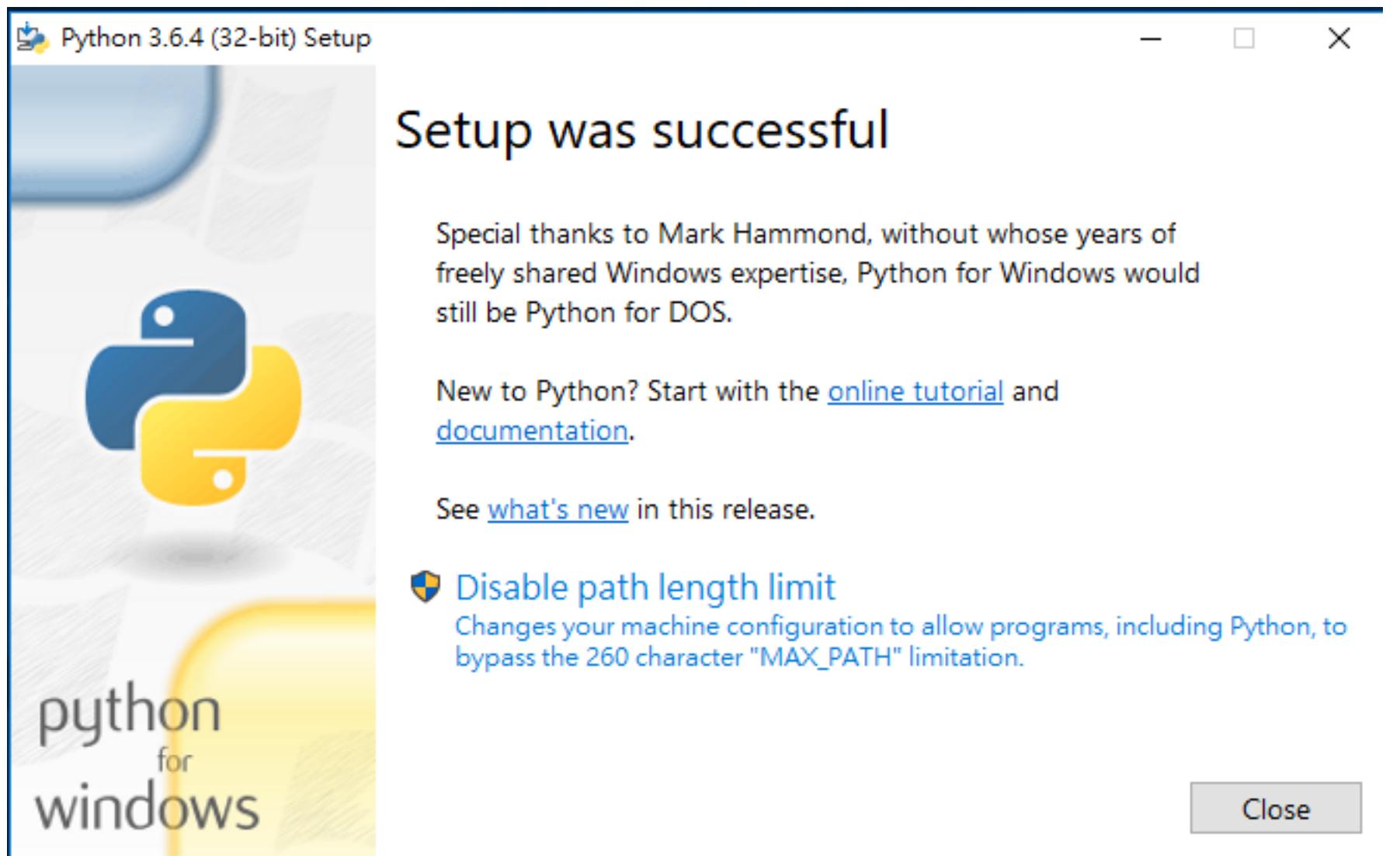
開始安裝3.6版

- 這是安裝程式軟體的路徑,預設是安裝在C:\Programs目錄下

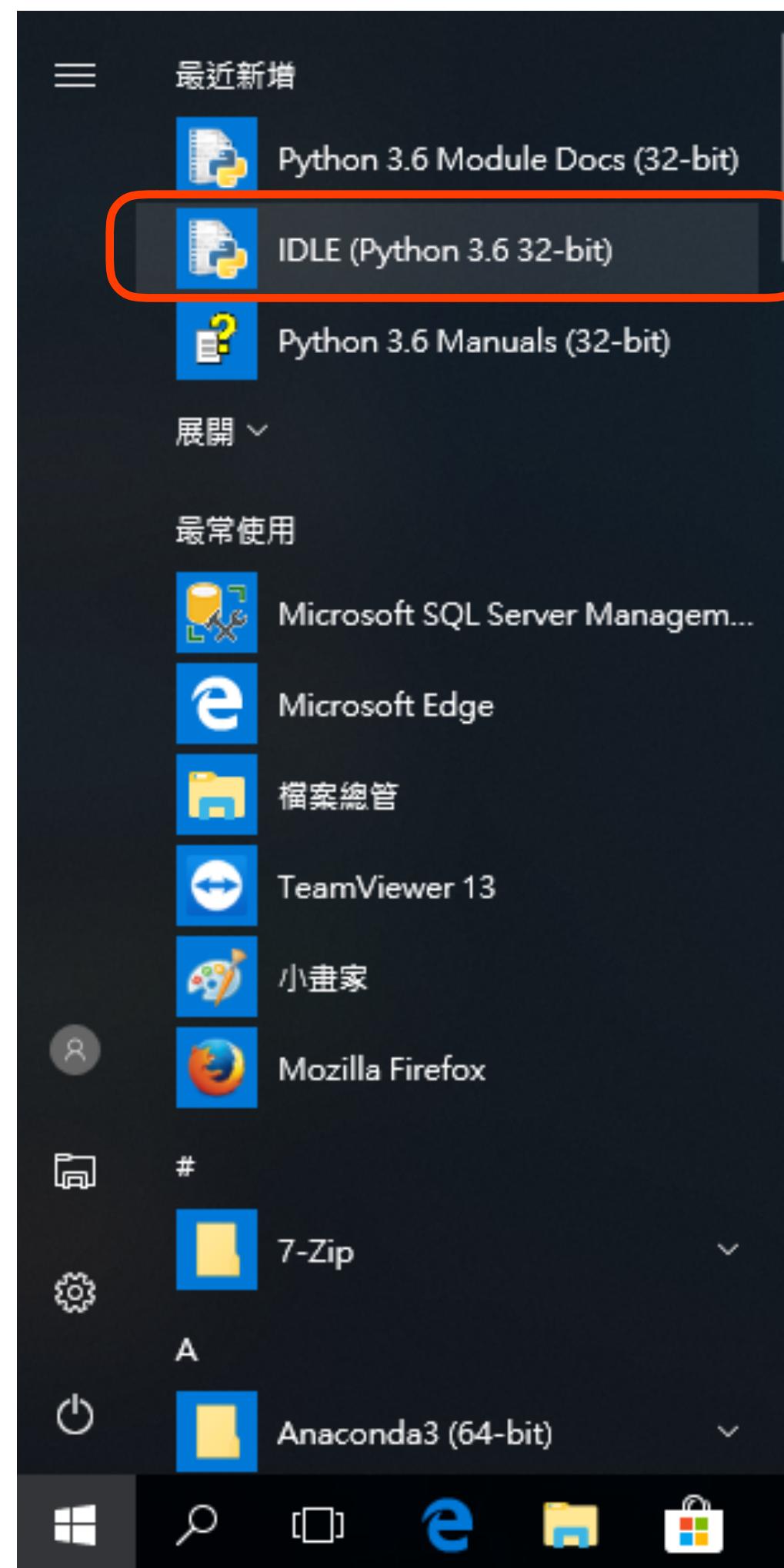


正在安裝中

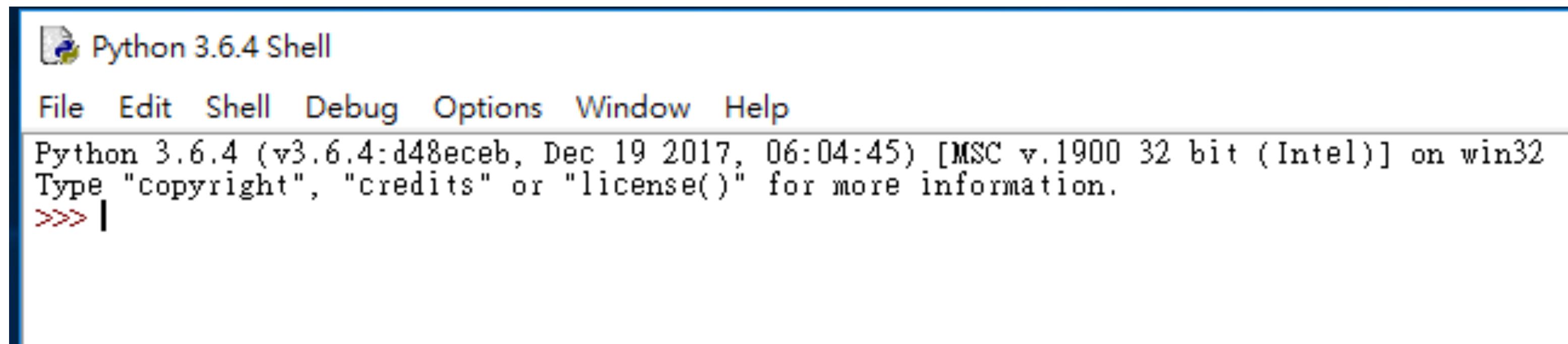




打開Python開發環境

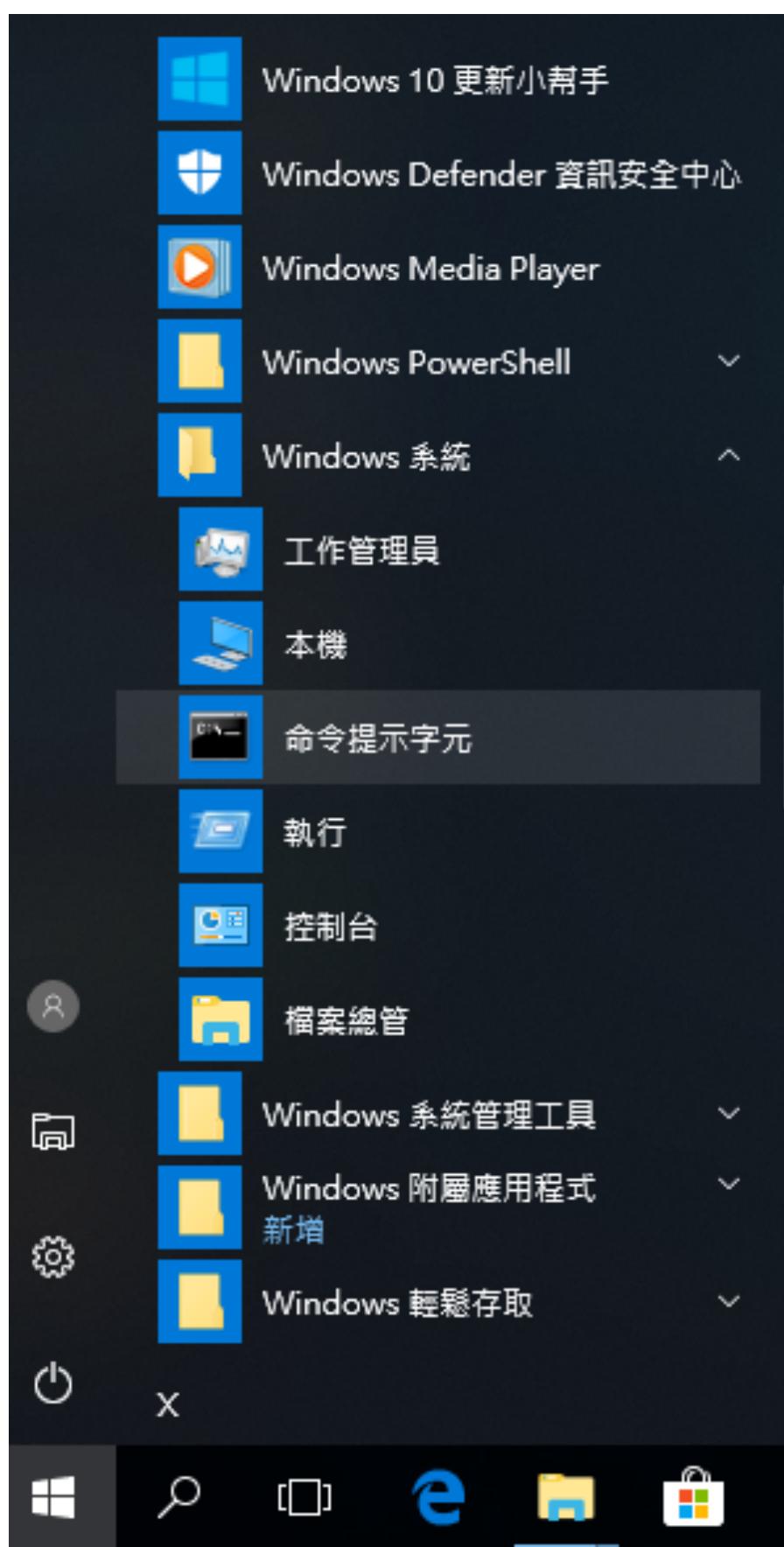


這是Python的Shell直譯器



A screenshot of the Python 3.6.4 Shell window. The title bar reads "Python 3.6.4 Shell". The menu bar includes "File", "Edit", "Shell", "Debug", "Options", "Window", and "Help". The main window displays the Python version information: "Python 3.6.4 (v3.6.4:d48ebeb, Dec 19 2017, 06:04:45) [MSC v.1900 32 bit (Intel)] on win32" and the instruction "Type "copyright", "credits" or "license()" for more information." A red cursor is visible at the bottom left, showing the prompt ">>> |".

按下win鍵,選取命令提示字元



在命令提示字元下輸入python



```
命令提示字元
Microsoft Windows [版本 10.0.16299.192]
(c) 2017 Microsoft Corporation. 著作權所有，並保留一切權利。
C:\Users\User>python
```

進入python直譯器

```
命令提示字元 - python
Microsoft Windows [版本 10.0.16299.192]
(c) 2017 Microsoft Corporation. 著作權所有，並保留一切權利。

C:\Users\User>python
Python 3.6.4 (v3.6.4:d48ebeb, Dec 19 2017, 06:04:45) [MSC v.1900 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> 1+1
2
>>>
```

離開python直譯器輸入exit()

```
命令提示字元
Microsoft Windows [版本 10.0.16299.192]
(c) 2017 Microsoft Corporation. 著作權所有，並保留一切權利。

C:\Users\User>python
Python 3.6.4 (v3.6.4:d48ebeb, Dec 19 2017, 06:04:45) [MSC v.1900 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> 1+1
2
>>> exit()

C:\Users\User>
```

1-2-2在Windows 10安裝 Anaconda

- 安裝Anaconda,Numpy,Matplotlib
- 選取Python 3.6版本
- 使用conda安裝模組
- 選取Spyder
- 選取Jupyter Notebook

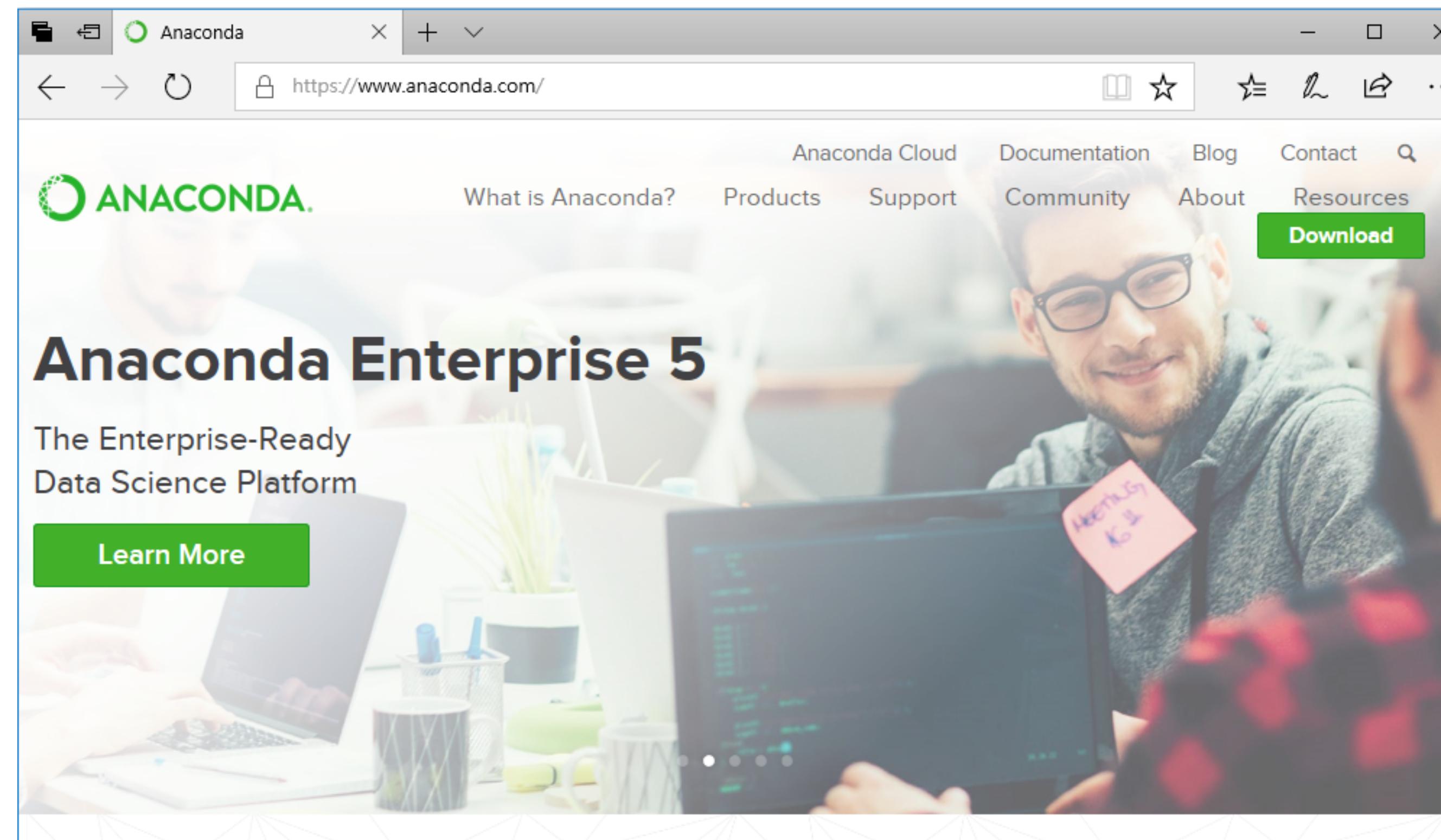
安裝

Anaconda,Numpy,Matplotlib

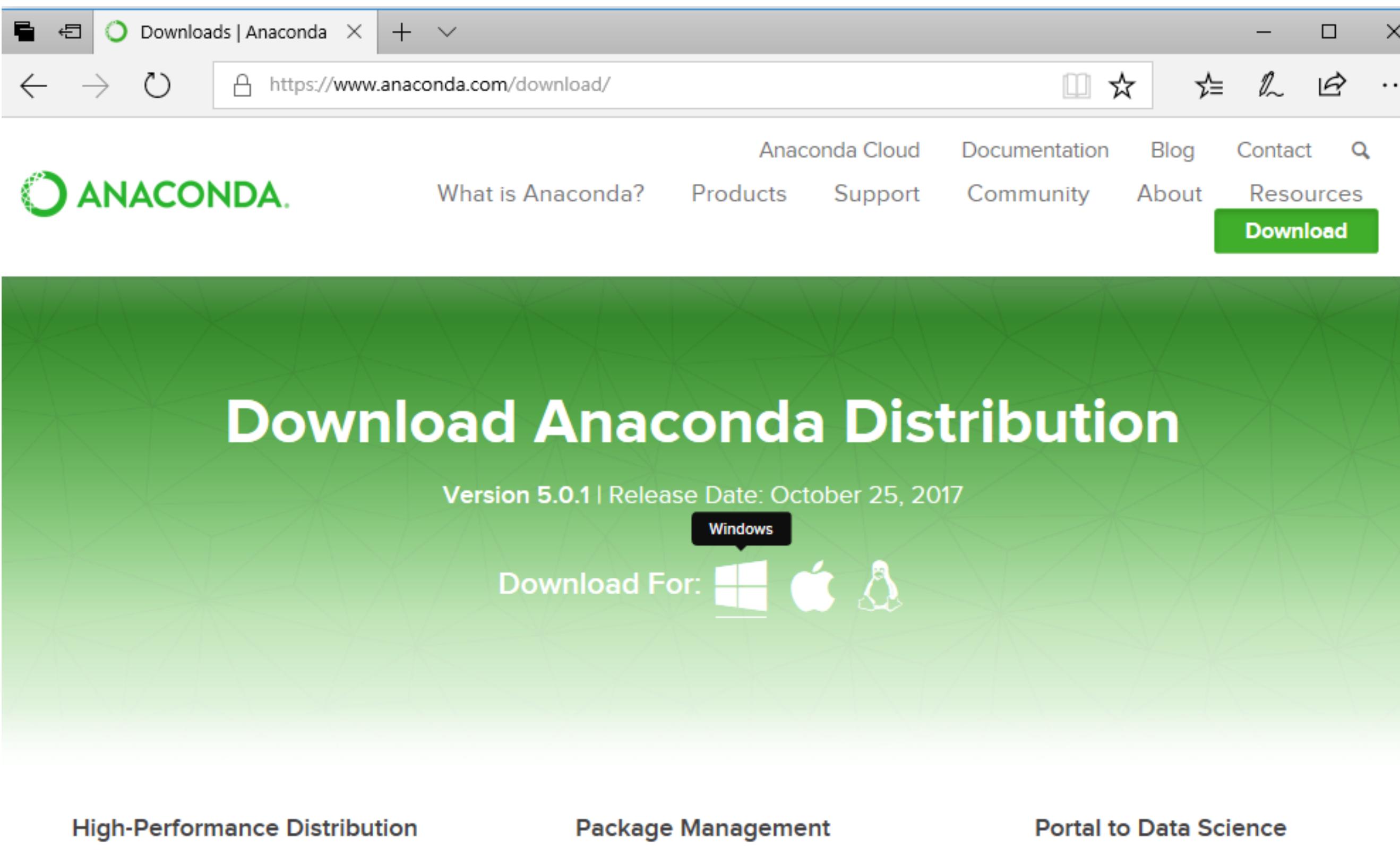
- 安裝Anaconda組合包
- 此包含Python,spyder,和科學大數據計算軟體
- 安裝Numpy,Matplotlib,Scipy

到ANACONDA網站

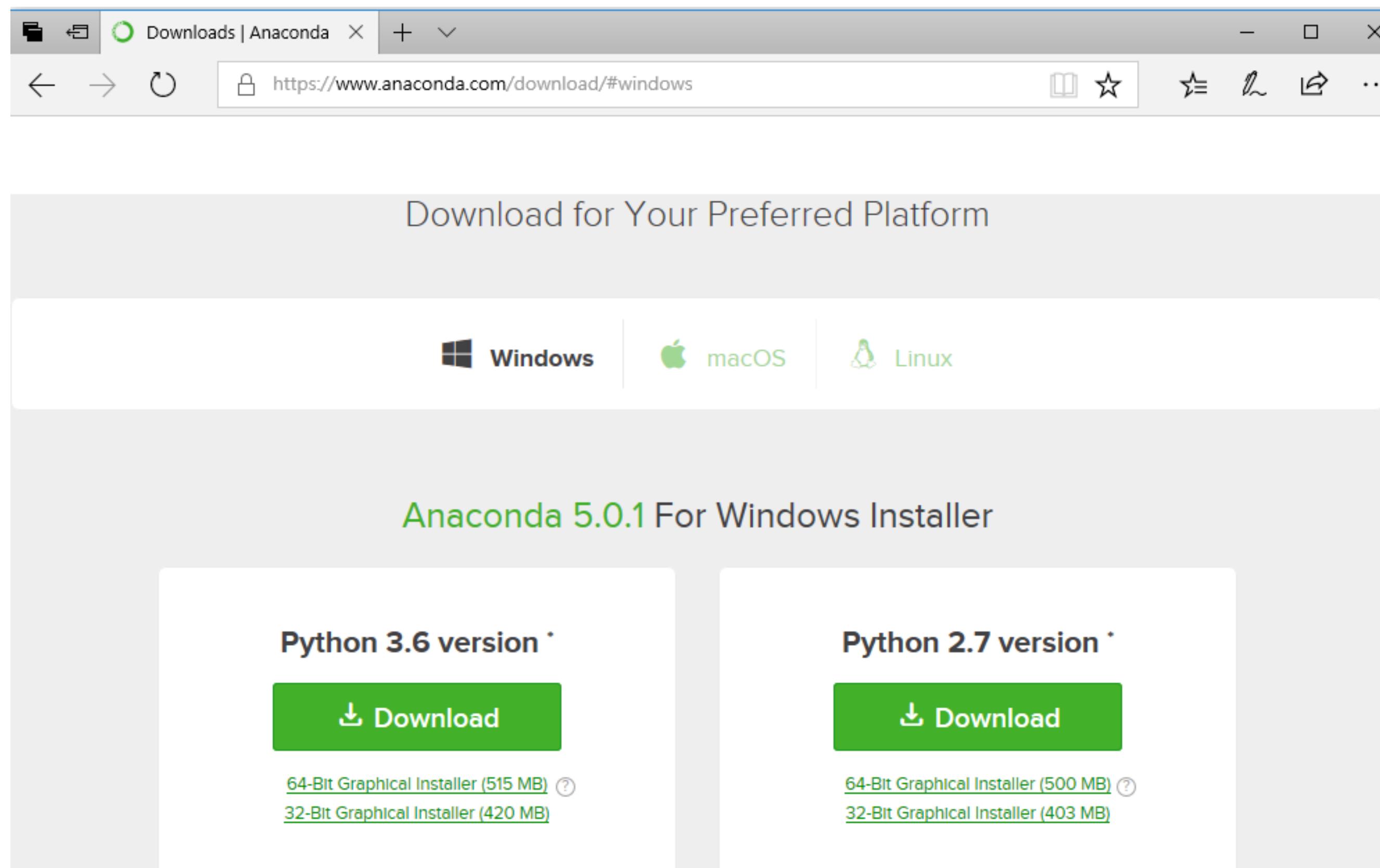
- 到Anconda下載Python組合包<https://www.anaconda.com/>



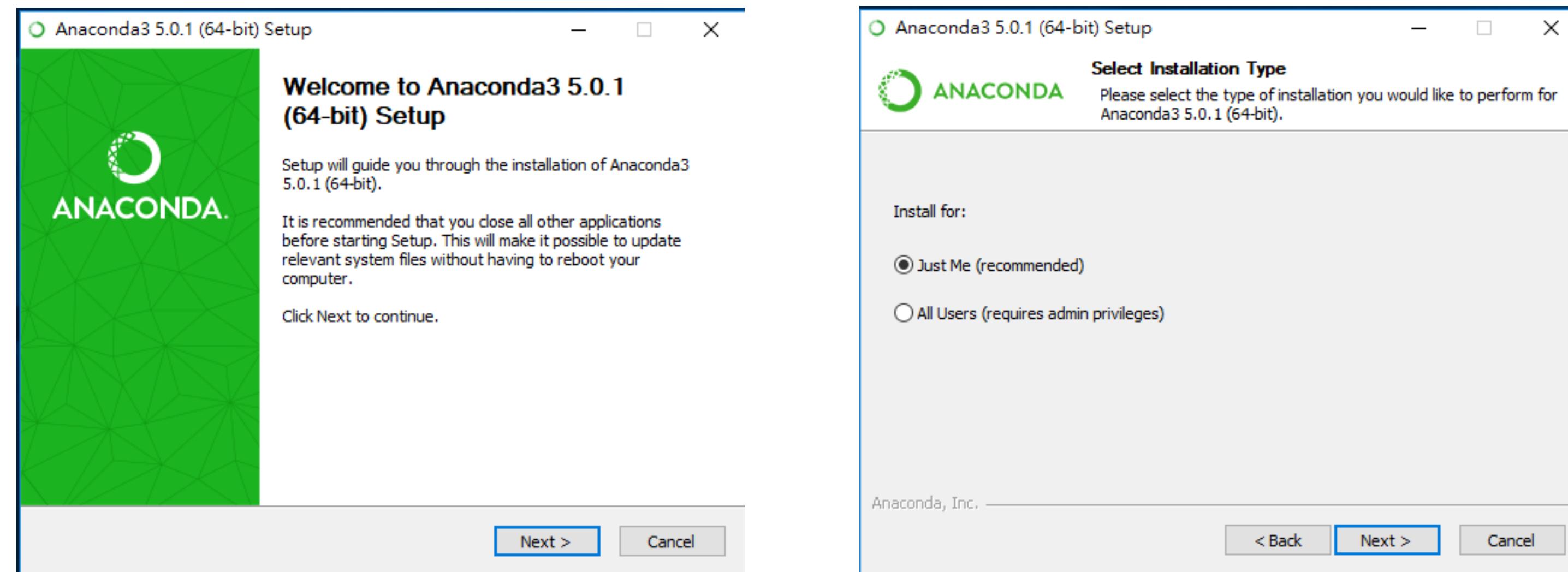
選取Windows下載



選取Python 3.6版本

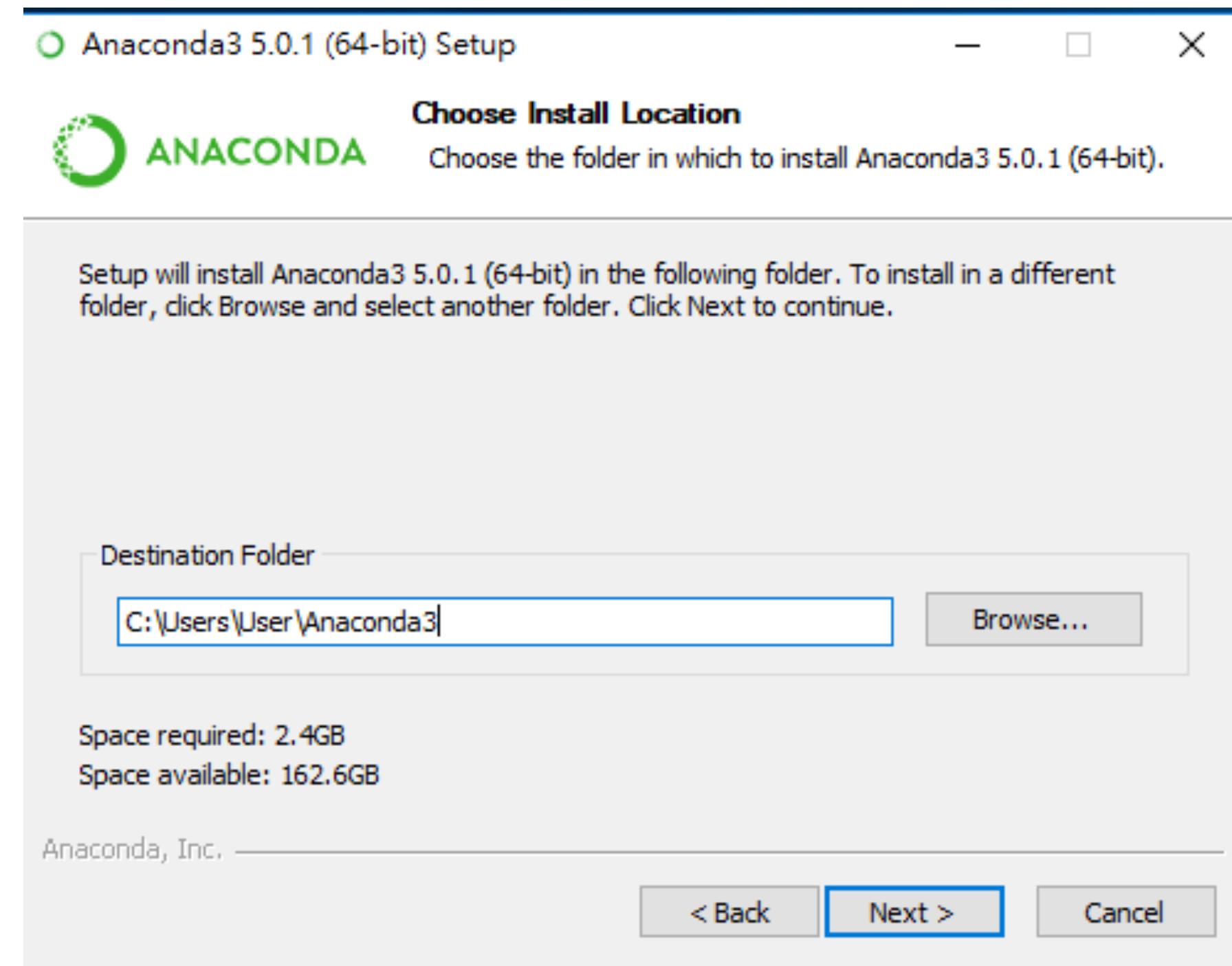


開始安裝

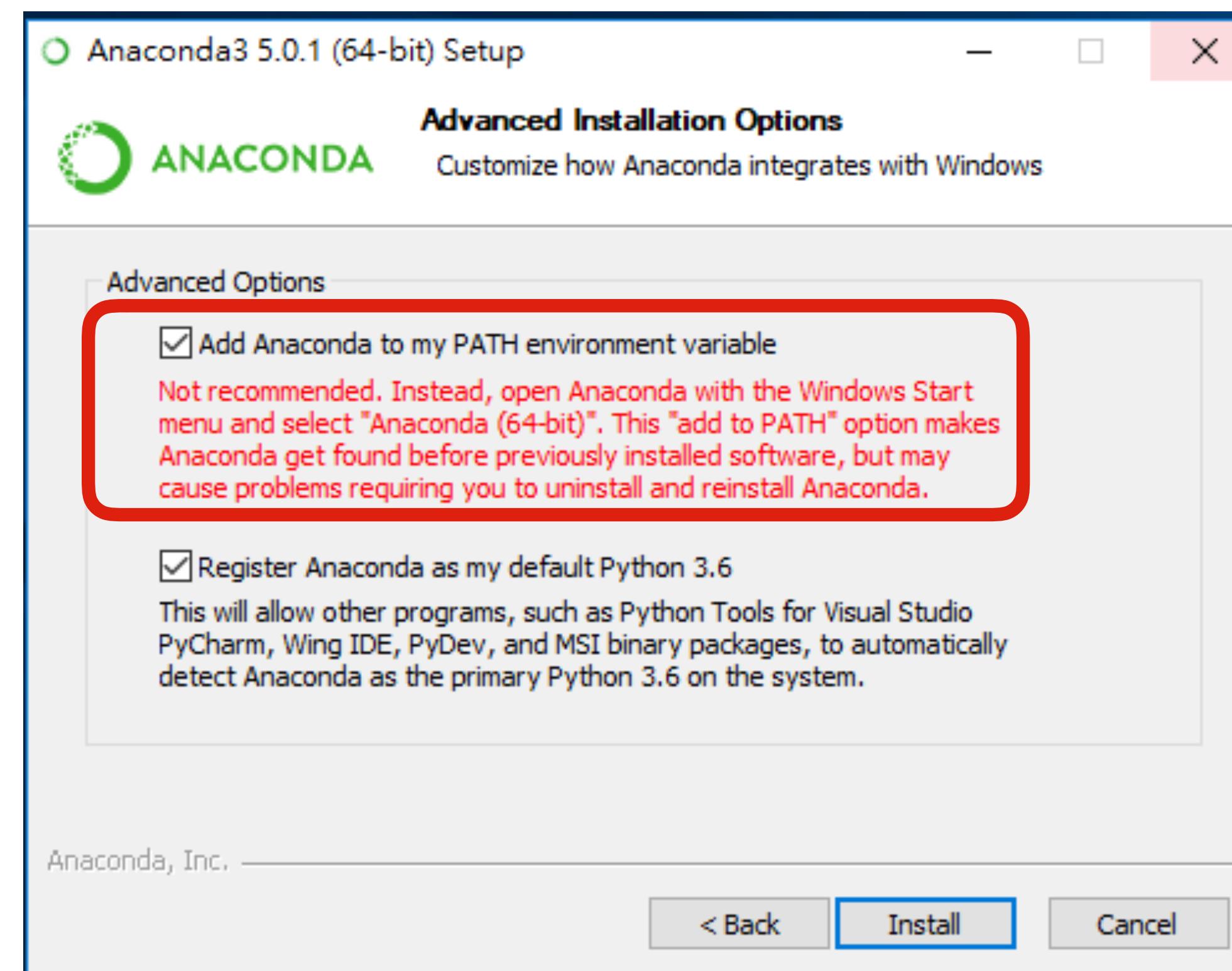


設定Anaconda的安裝目錄

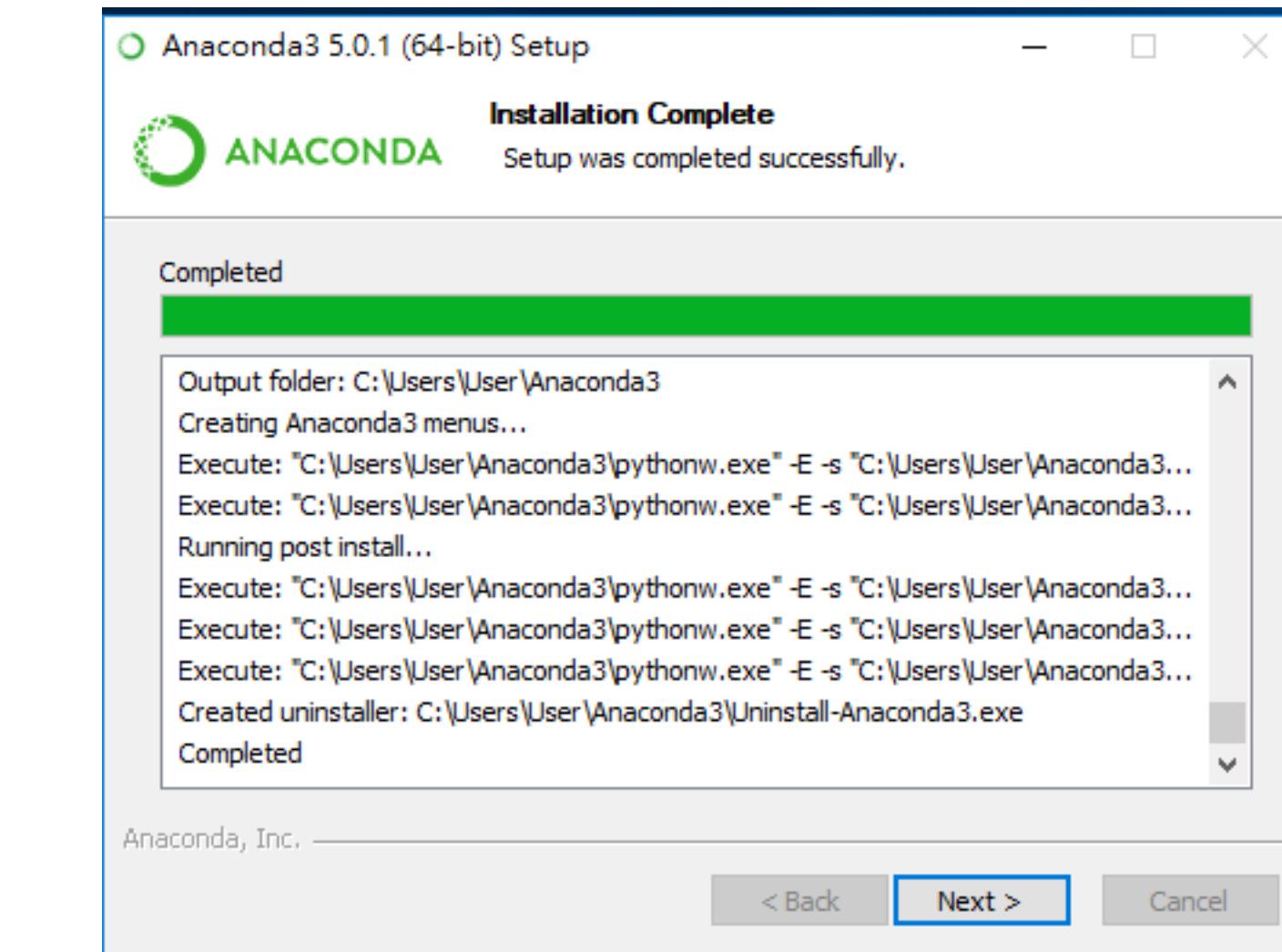
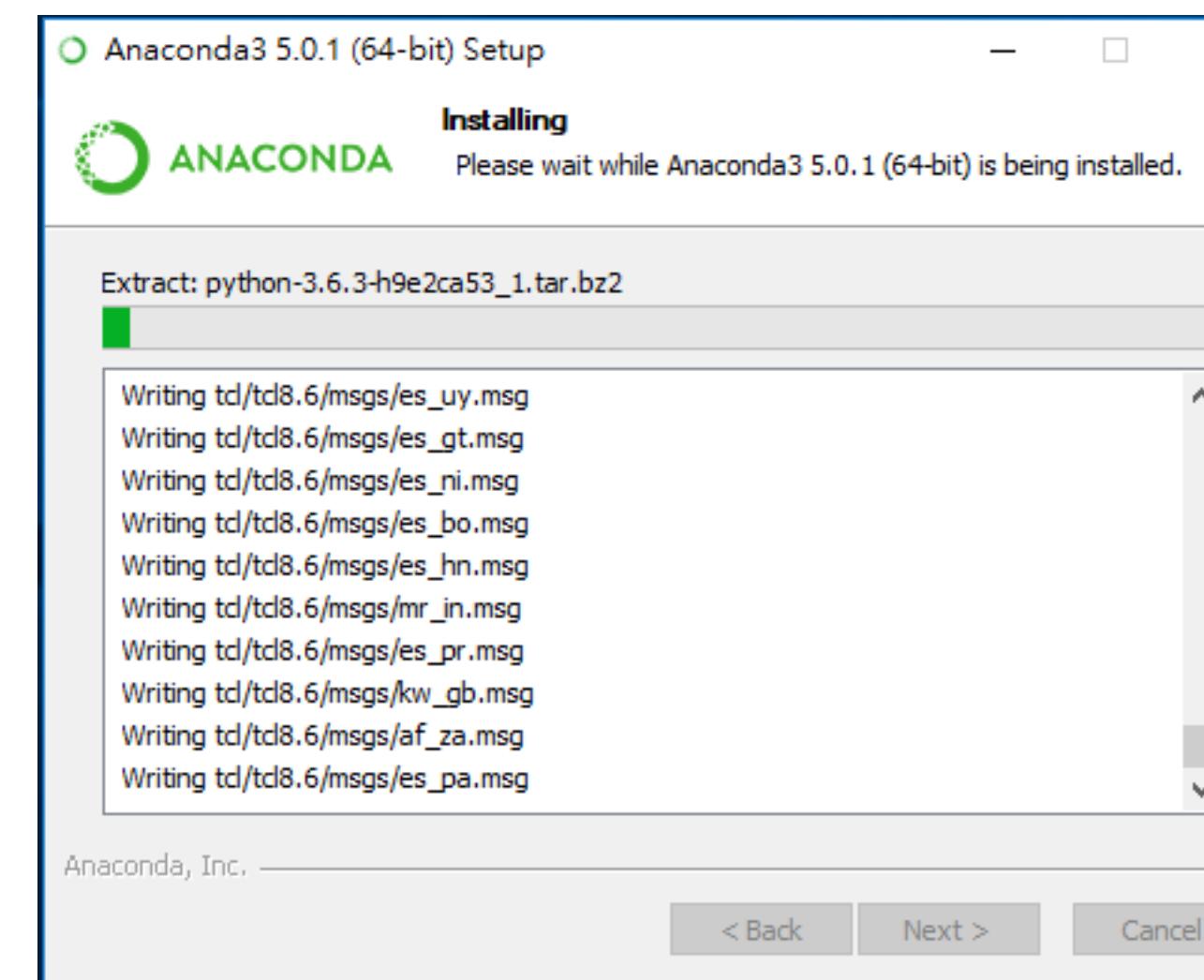
- 使用預設



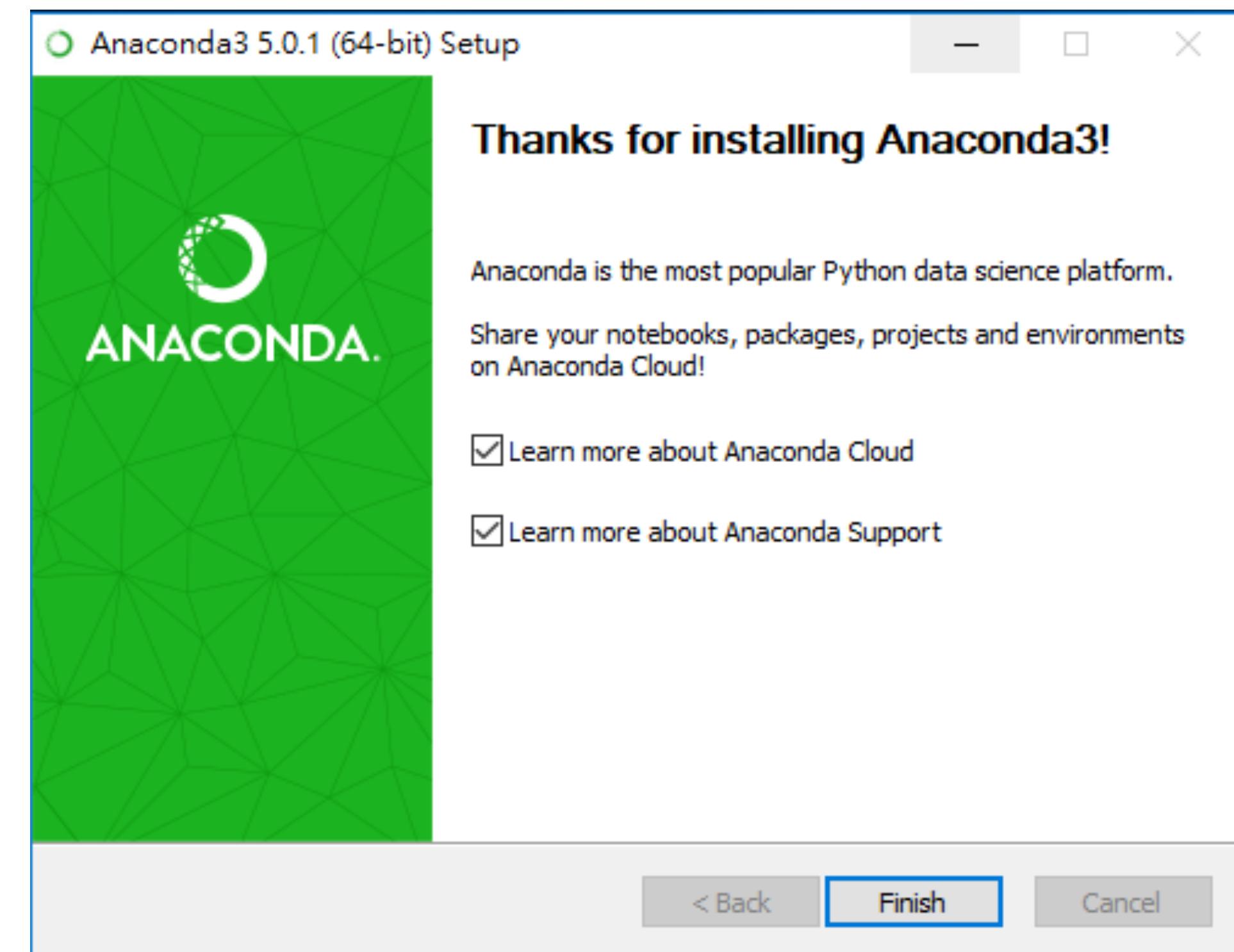
增加Anaconda到環境變數路徑



安裝過程中



安裝完成



使用conda安裝模組

- conda install numpy

```
命令提示字元
Microsoft Windows [版本 10.0.16299.192]
(c) 2017 Microsoft Corporation. 著作權所有，並保留一切權利。

C:\Users\User>conda install numpy
Fetching package metadata .....
Solving package specifications: .

Package plan for installation in environment C:\Users\User\Anaconda3:

The following packages will be UPDATED:

    anaconda: 5.0.1-py36h8316230_2 --> custom-py36h363777c_0
    conda:    4.3.30-py36h7e176b0_0 --> 4.4.7-py36_0
    numpy:    1.13.3-py36ha320f96_0 --> 1.13.3-py36h4a99626_2
    pycosat:  0.6.2-py36hf17546d_1 --> 0.6.3-py36h413d8a4_0

Proceed ([y]/n)? y

anaconda-custo 100% |#####| Time: 0:00:00 578.37 kB/s
numpy-1.13.3-p 100% |#####| Time: 0:00:03 1.18 MB/s
pycosat-0.6.3- 100% |#####| Time: 0:00:00 1.11 MB/s
conda-4.4.7-py 100% |#####| Time: 0:00:00 1.18 MB/s
```

conda install matplotlib

```
命令提示字元

C:\Users\User>conda --version
conda 4.4.7

C:\Users\User>conda install matplotlib
Solving environment: done

## Package Plan ##

environment location: C:\Users\User\Anaconda3

added / updated specs:
- matplotlib

The following packages will be downloaded:

  package          |      build
  -----|-----
  openssl-1.0.2n   |      h74b6da3_0      5.4 MB
  certifi-2017.11.5 |      py36hb8ac631_0    196 KB
  matplotlib-2.1.2  |      py36h016c42a_0     6.5 MB
  -----
                           Total:    12.1 MB

The following packages will be UPDATED:

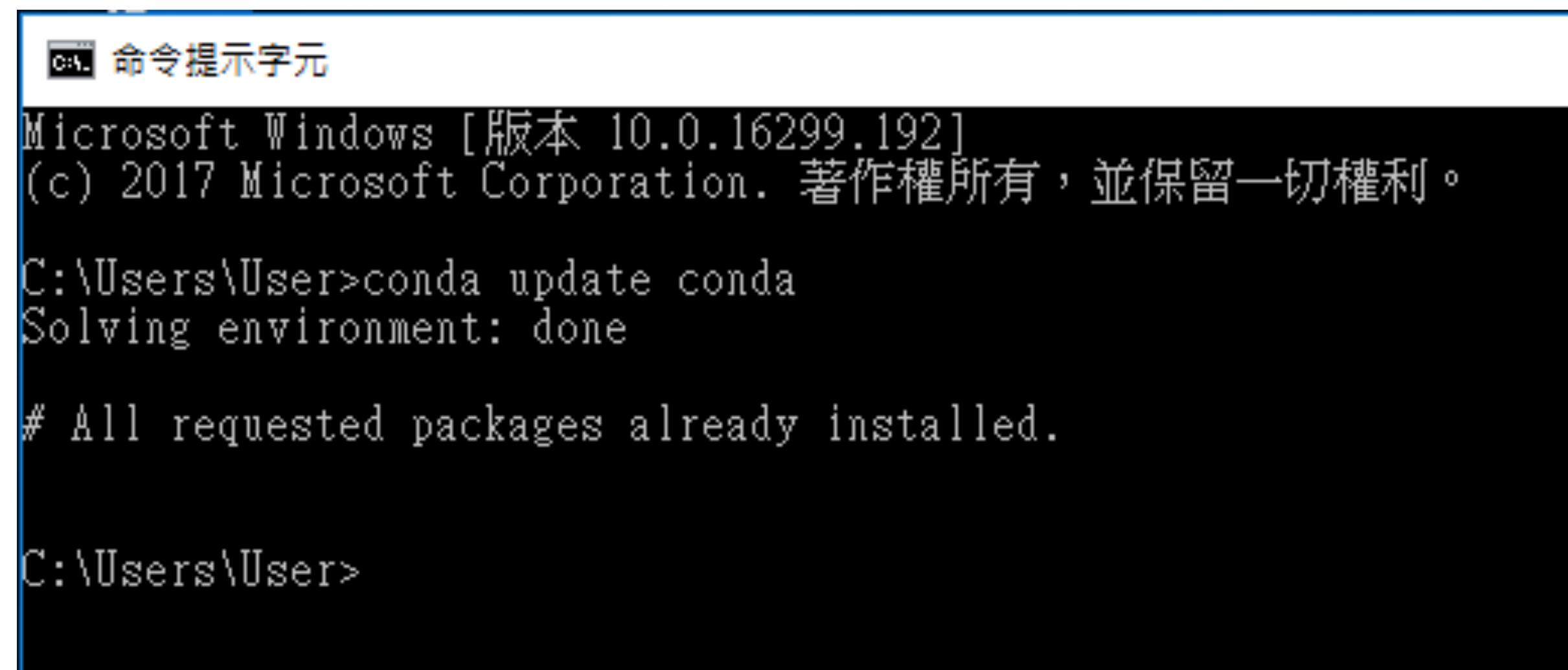
  certifi: 2017.7.27.1-py36h043bc9e_0 --> 2017.11.5-py36hb8ac631_0
  matplotlib: 2.1.0-py36h11b4b9c_0 --> 2.1.2-py36h016c42a_0
  openssl: 1.0.2l-vc14hcac20b0_2 --> 1.0.2n-h74b6da3_0

Proceed ([y]/n)? y

Downloading and Extracting Packages
openssl 1.0.2n: ###### | 100%
certifi 2017.11.5: ###### | 100%
matplotlib 2.1.2: ###### | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done

C:\Users\User>
```

conda更新



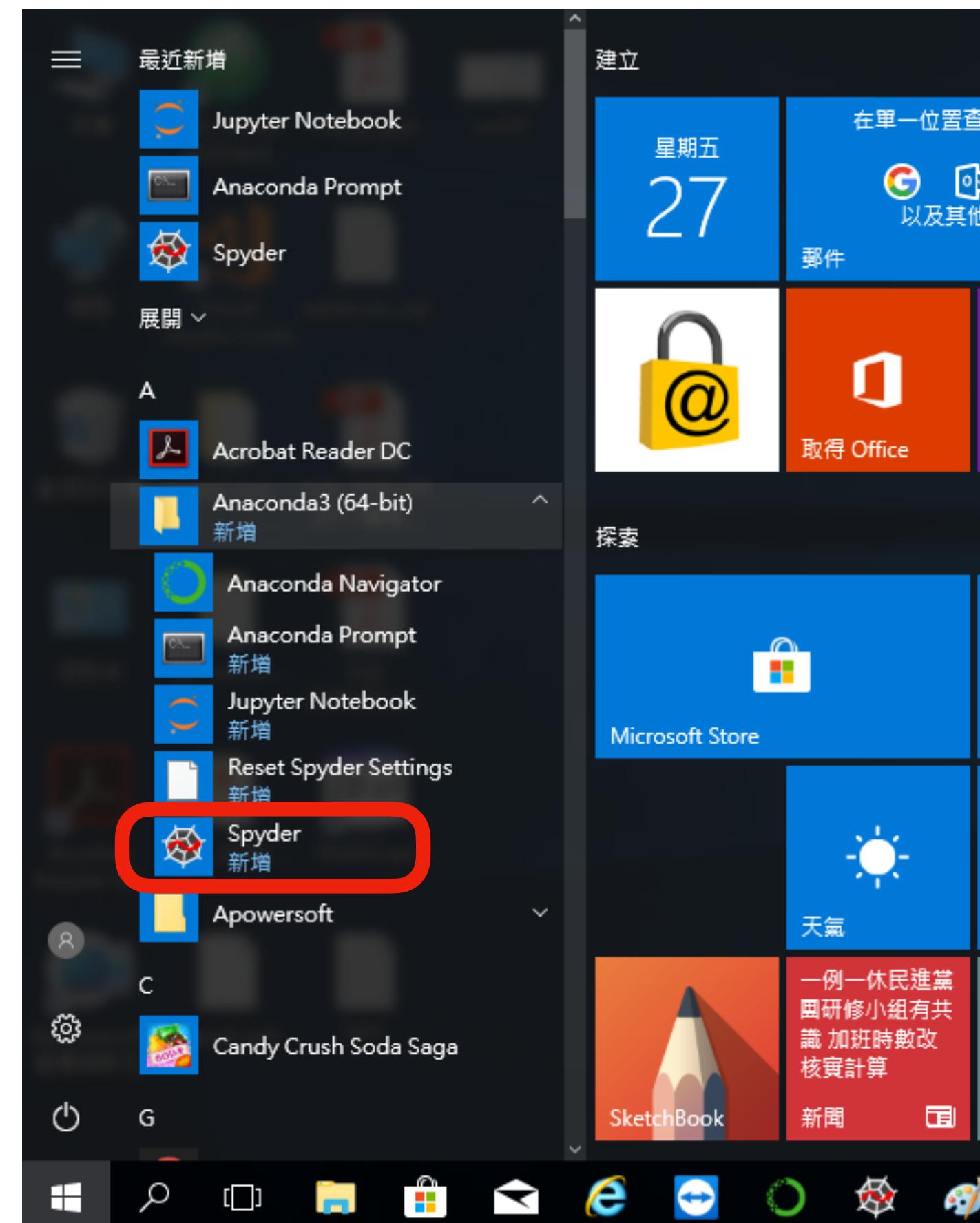
```
命令提示字元
Microsoft Windows [版本 10.0.16299.192]
(c) 2017 Microsoft Corporation. 著作權所有，並保留一切權利。

C:\Users\User>conda update conda
Solving environment: done

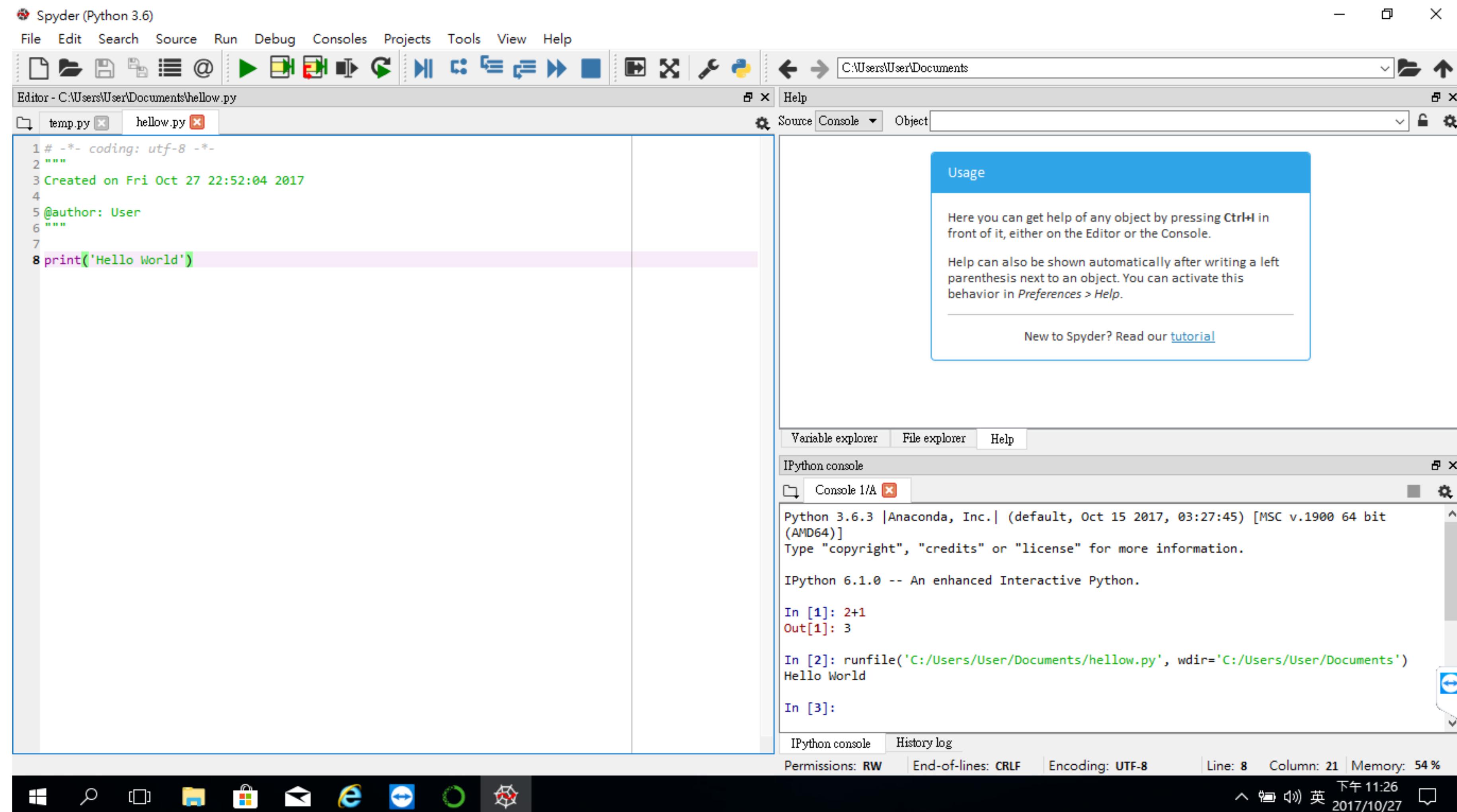
# All requested packages already installed.

C:\Users\User>
```

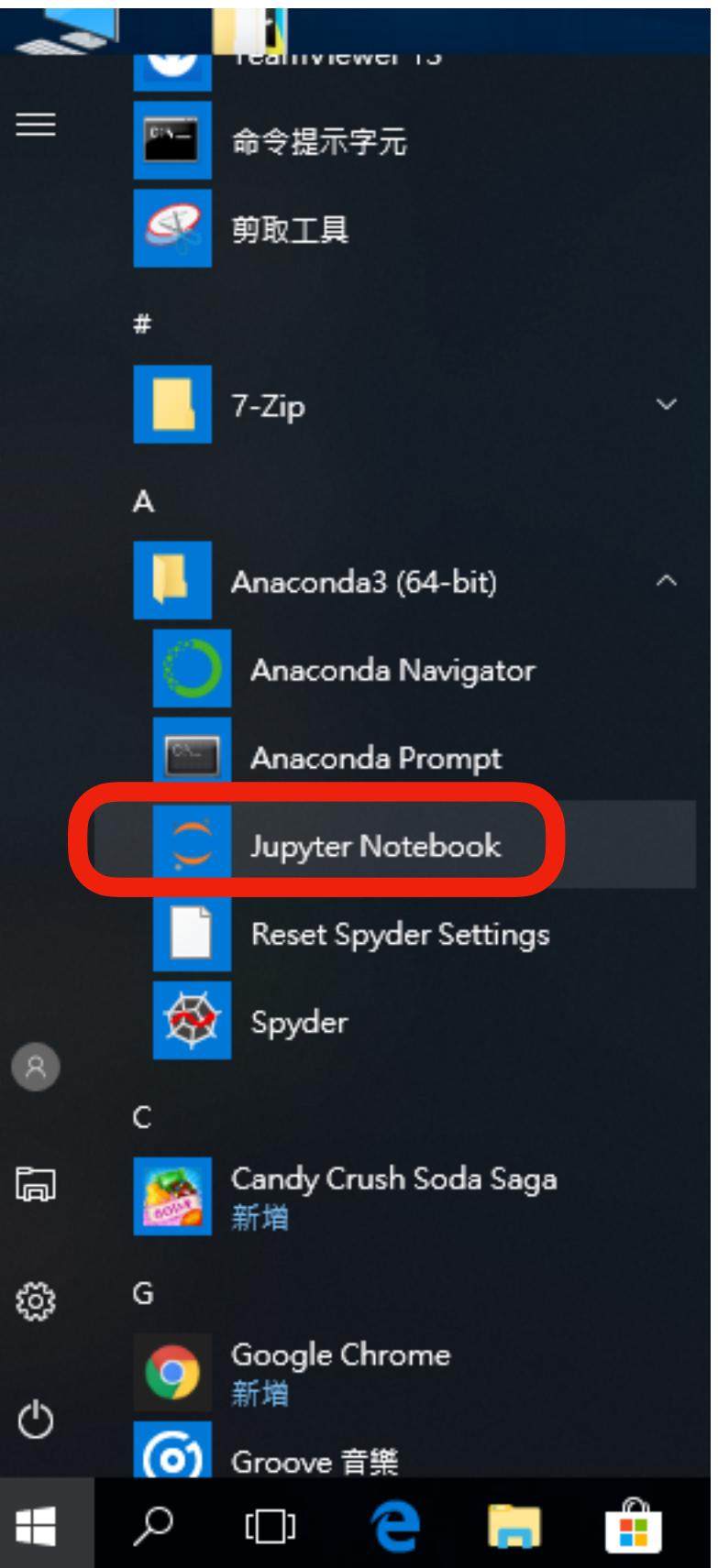
選取Spyder



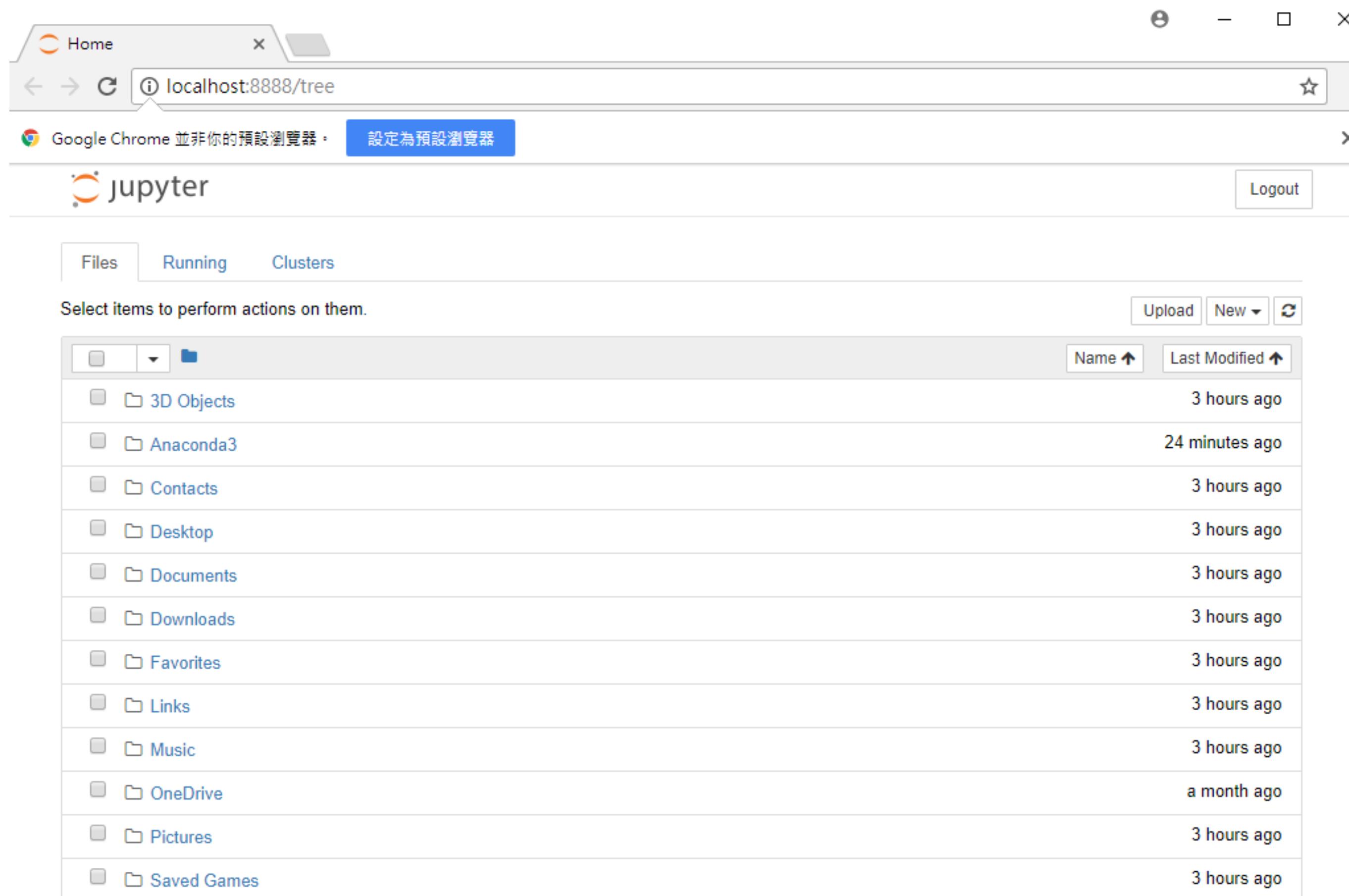
執行Spyder



選取Jupyter Notebook

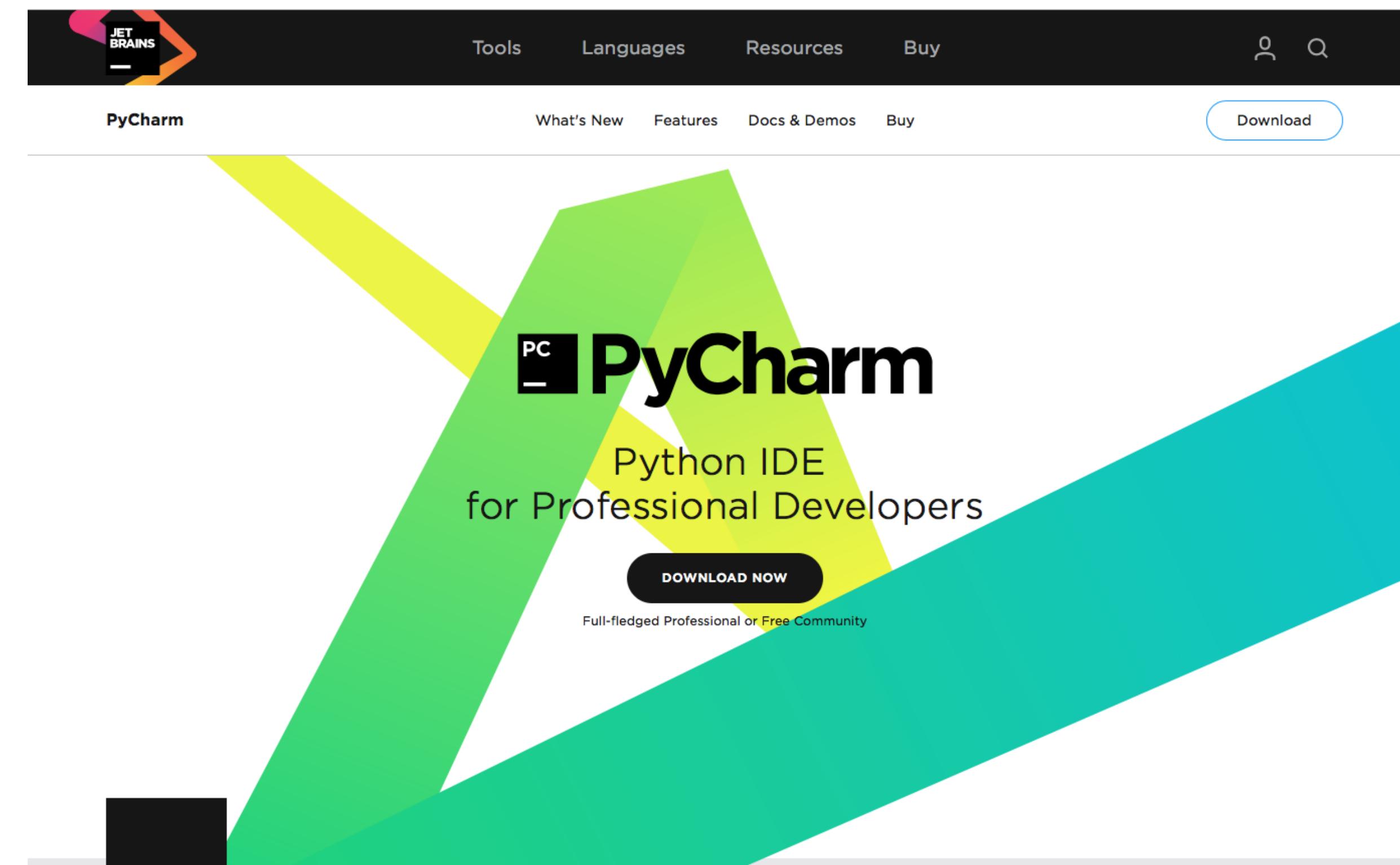


打開網頁版的Jupyter



1-3下載及安裝PyCharm

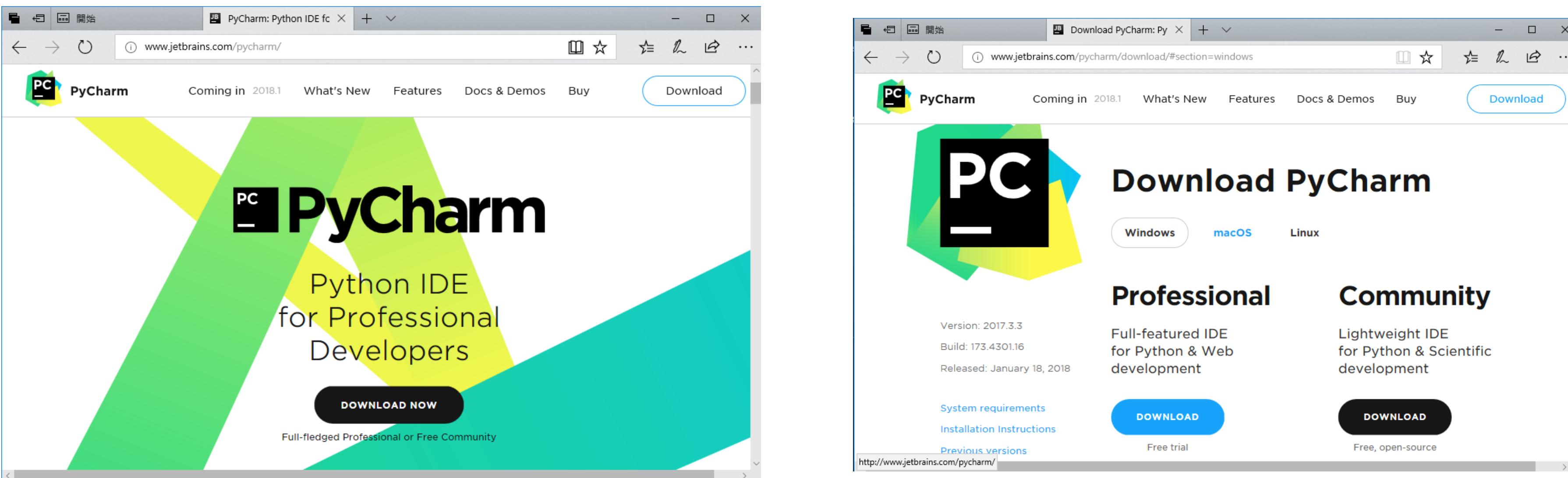
- <https://www.jetbrains.com/pycharm/>



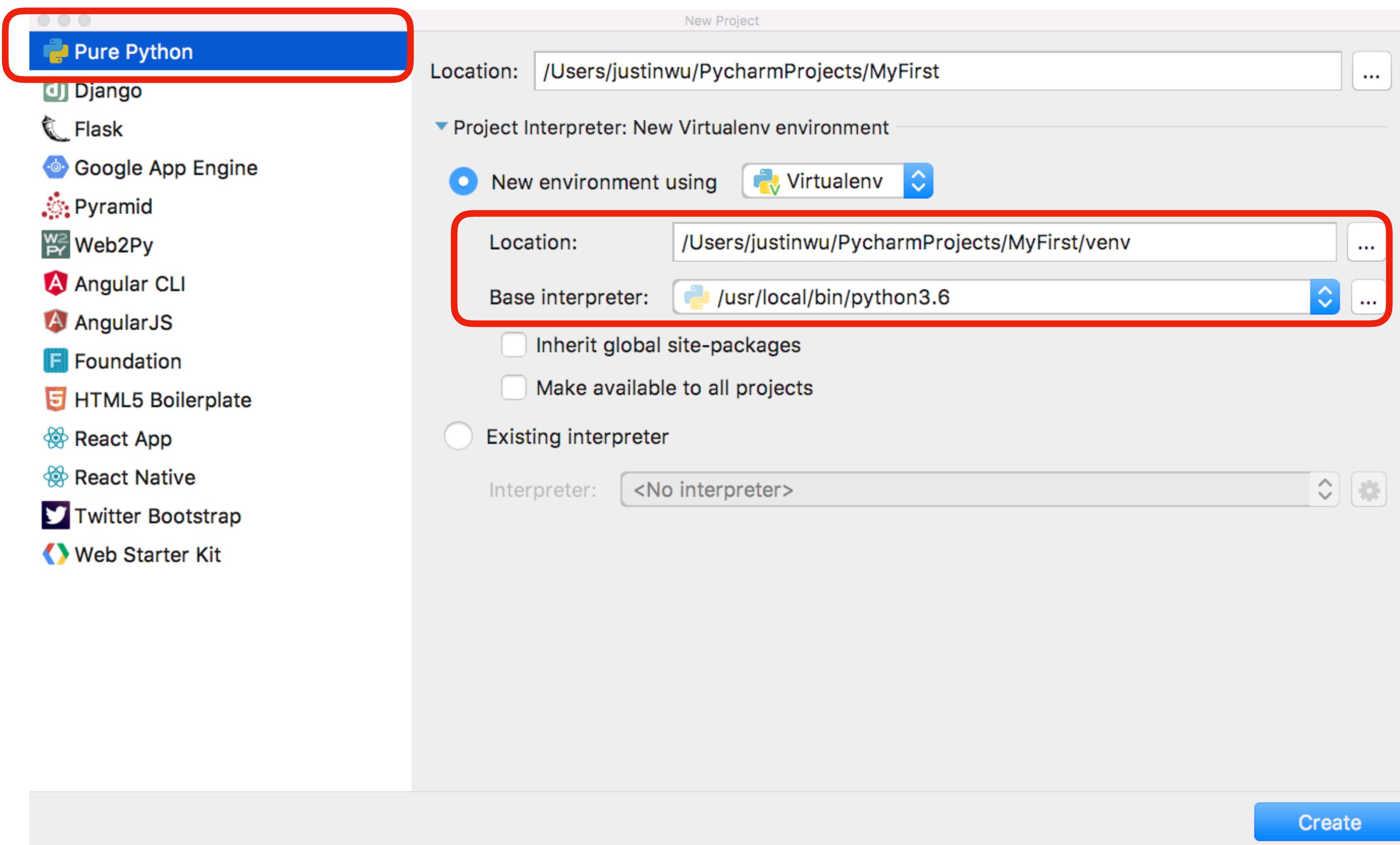
1-3-1 在Mac下載及安裝

PyCharm

- 我們將PyCharm下載後，在Mac電腦安裝，下載Community版



安裝完Python後,設定直譯器路徑



Pycharm可以使用Python和 Jupyter notebook的檔案

- 我們可以新增Python的檔案
- 選取File->NEW->Python File

MyFirst [~/PycharmProjects/MyFirst] - ~/Desktop/TOP/python/keras/examples/minst_cnn.ipynb

Project mnist_cnn.py minst_cnn.ipynb

MyFirst ~/PycharmProjects/MyFirst

venv
bin
include
lib
.Python
pip-selfcheck.json

New

- Cut ⌘X
- Copy ⌘C
- Copy Path ⌘⌘C
- Copy Relative Path ⌘⇧⌘C
- Paste ⌘V
- Jump to Source F4
- Find Usages ⌘F7
- Inspect Code...
- Refactor
- Clean Python Compiled Files
- Add to Favorites
- Delete... ⌈X
- Local History
- Synchronize 'pip-selfcheck.json'
- Reveal in Finder
- Compare With... ⌘D
- Compare File with Editor

In [3]: import keras
from keras.datasets import mnist
from keras.models import Sequential
from keras.layers import Dense, Dropout, Flatten
from keras.layers import Conv2D, MaxPooling2D
backend as K

= 28, 28
, (x_test, y_test) = mnist.load_data()

reshape(x_train.shape[0], img_rows,
shape(x_test.shape[0], img_rows, i
_rows, img_cols, 1)

astype('float32')
type('float32')

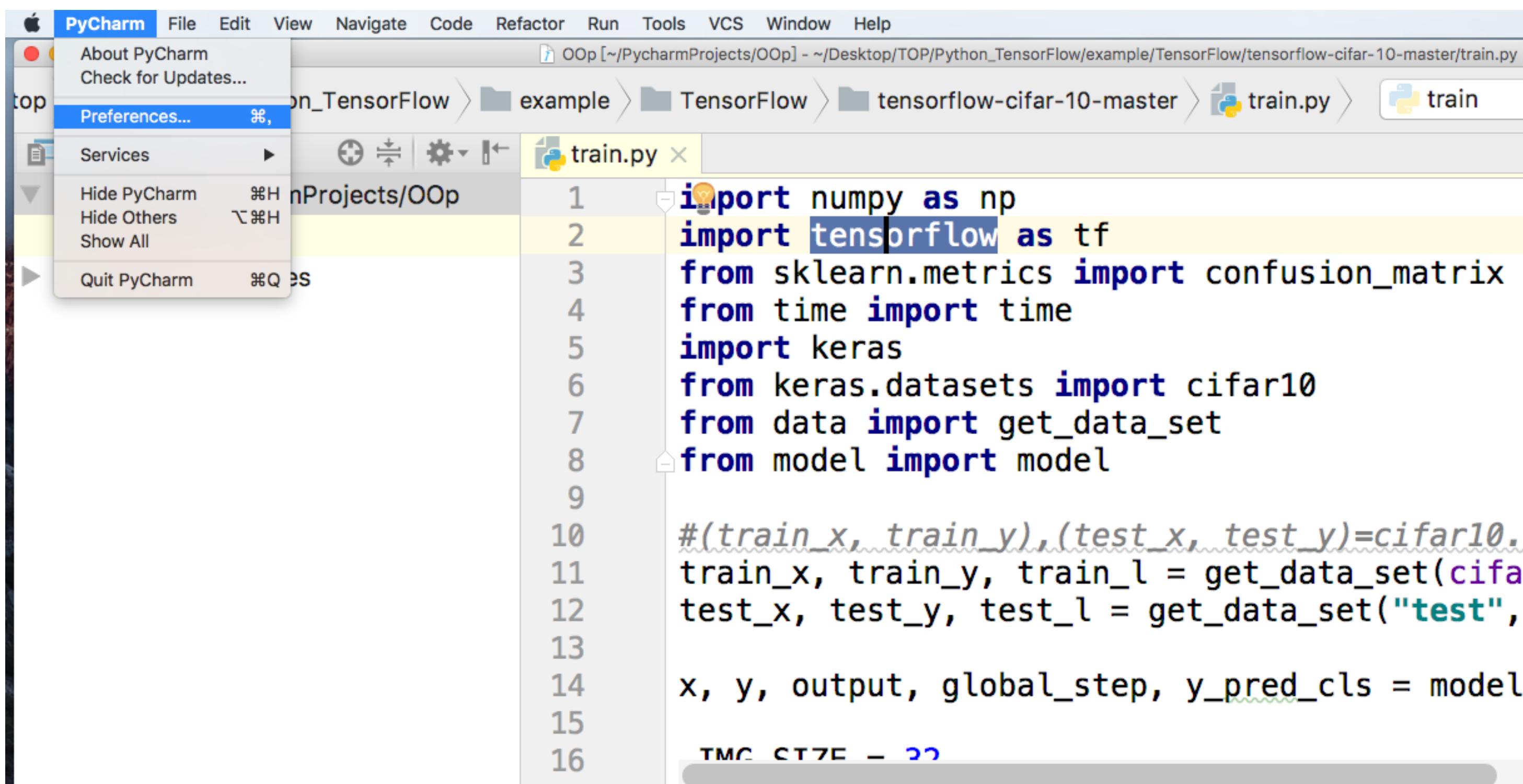
x_train /= 255
print('x_train shape:', x_train.shape)

Creates a Python

2:21

1-3-2在Pycharm新增函式庫

- 選取PyCharm->Preference

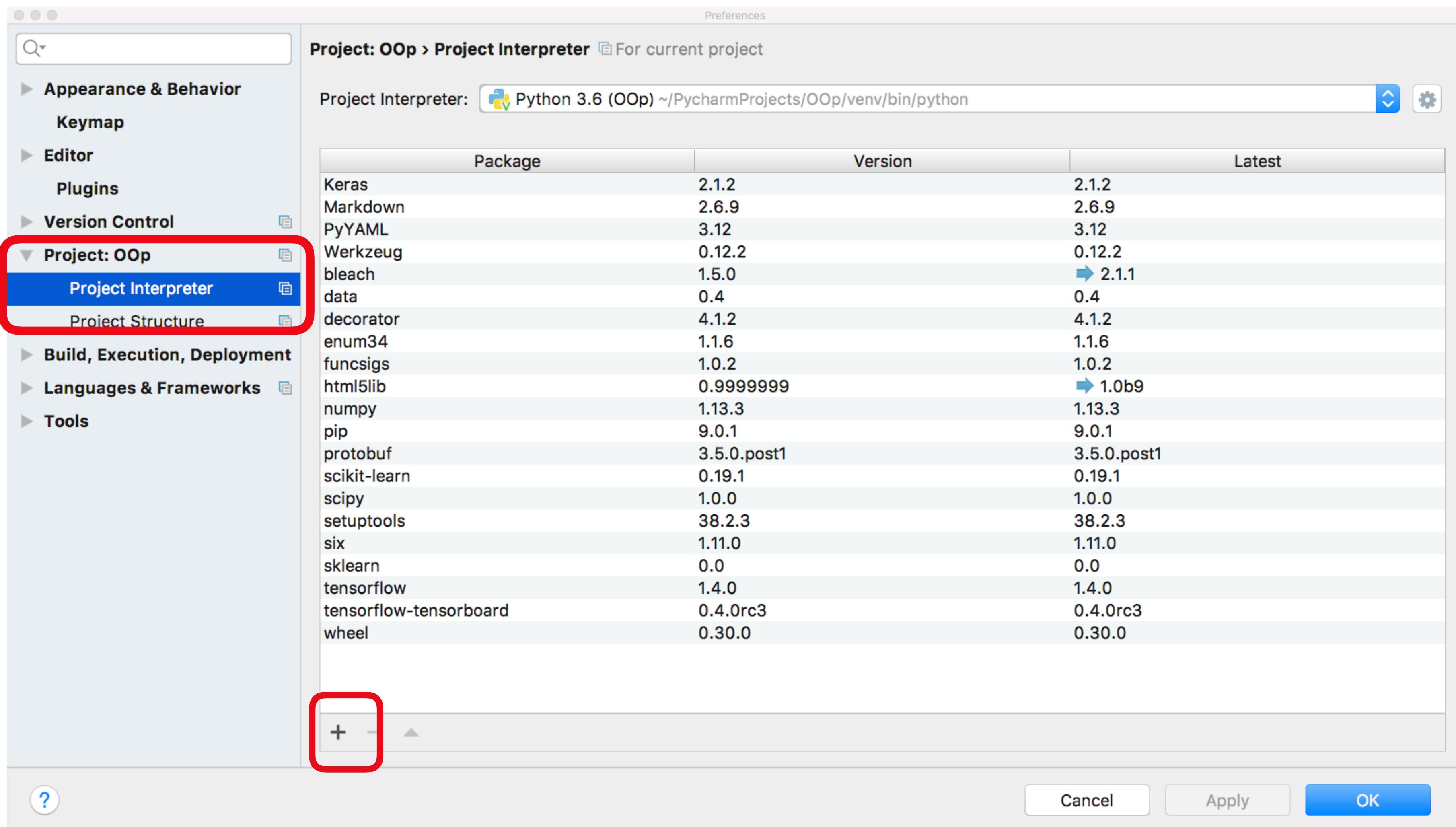


The screenshot shows the PyCharm IDE interface. The top menu bar has "PyCharm" selected. A dropdown menu is open under "PyCharm" with the following options: "About PyCharm", "Check for Updates...", "Preferences...", "Services", "Hide PyCharm", "Hide Others", "Show All", and "Quit PyCharm". The "Preferences..." option is highlighted with a blue selection bar. The main workspace shows a file named "train.py" with Python code. The code imports numpy, tensorflow, sklearn.metrics, time, keras, keras.datasets, and model. It then defines variables for training and testing data using get_data_set, and finally calls a function "model". The code is numbered from 1 to 16.

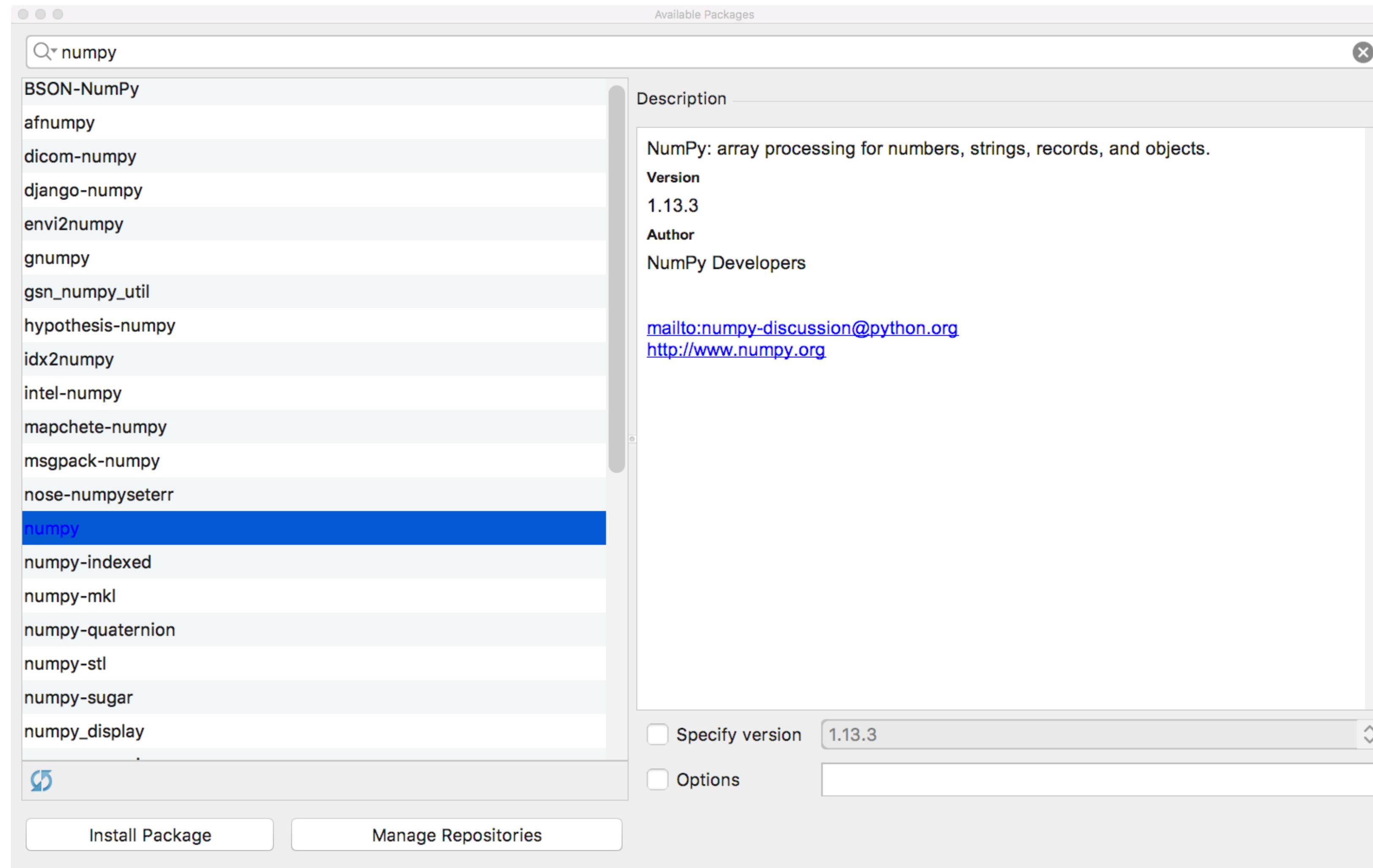
```
import numpy as np
import tensorflow as tf
from sklearn.metrics import confusion_matrix
from time import time
import keras
from keras.datasets import cifar10
from data import get_data_set
from model import model

#(train_x, train_y), (test_x, test_y)=cifar10.
train_x, train_y, train_l = get_data_set(cifa
test_x, test_y, test_l = get_data_set("test",
x, y, output, global_step, y_pred_cls = model
```

選取直譯器，選取 +

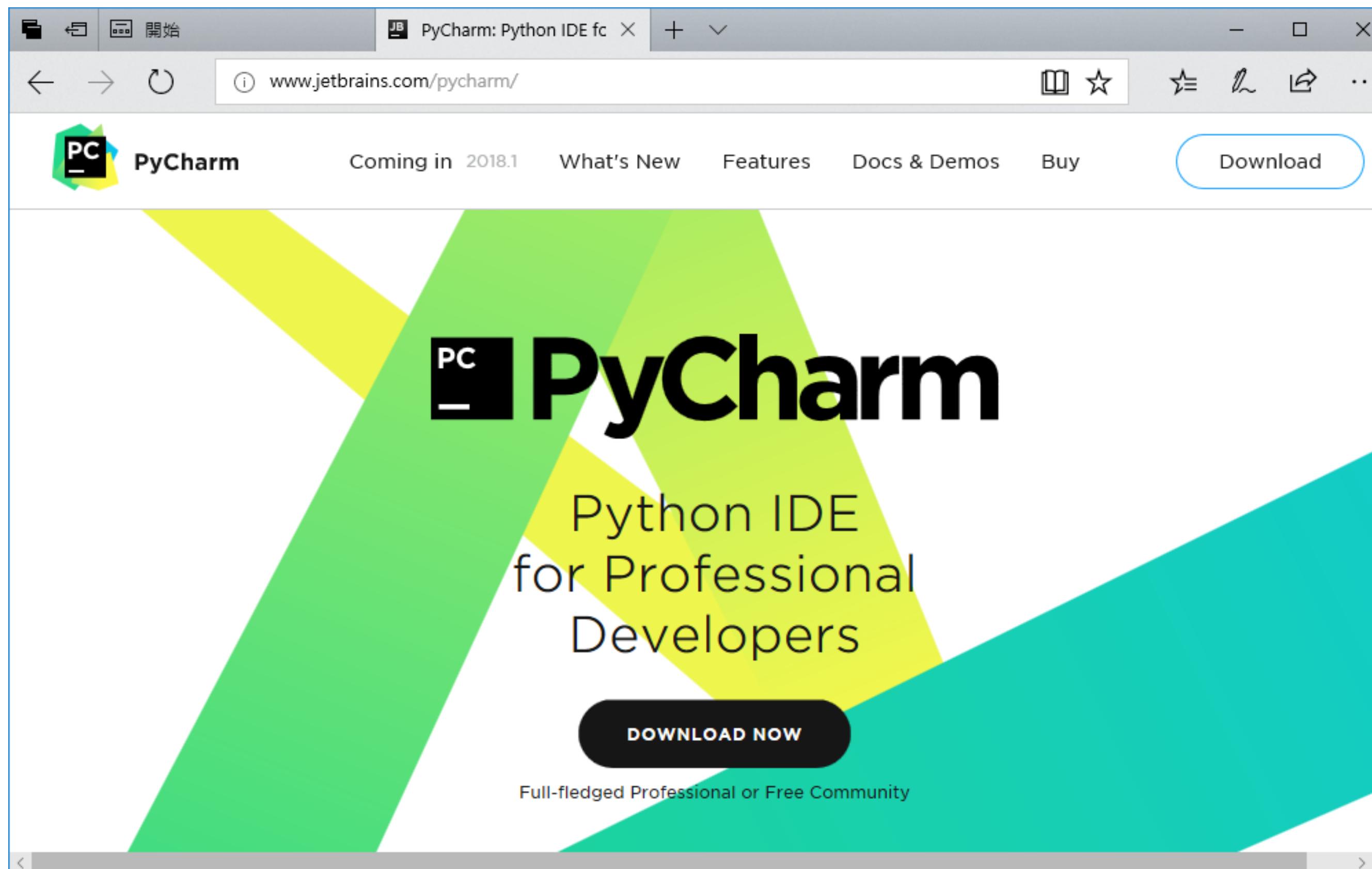


選取函式庫，再安裝install Package

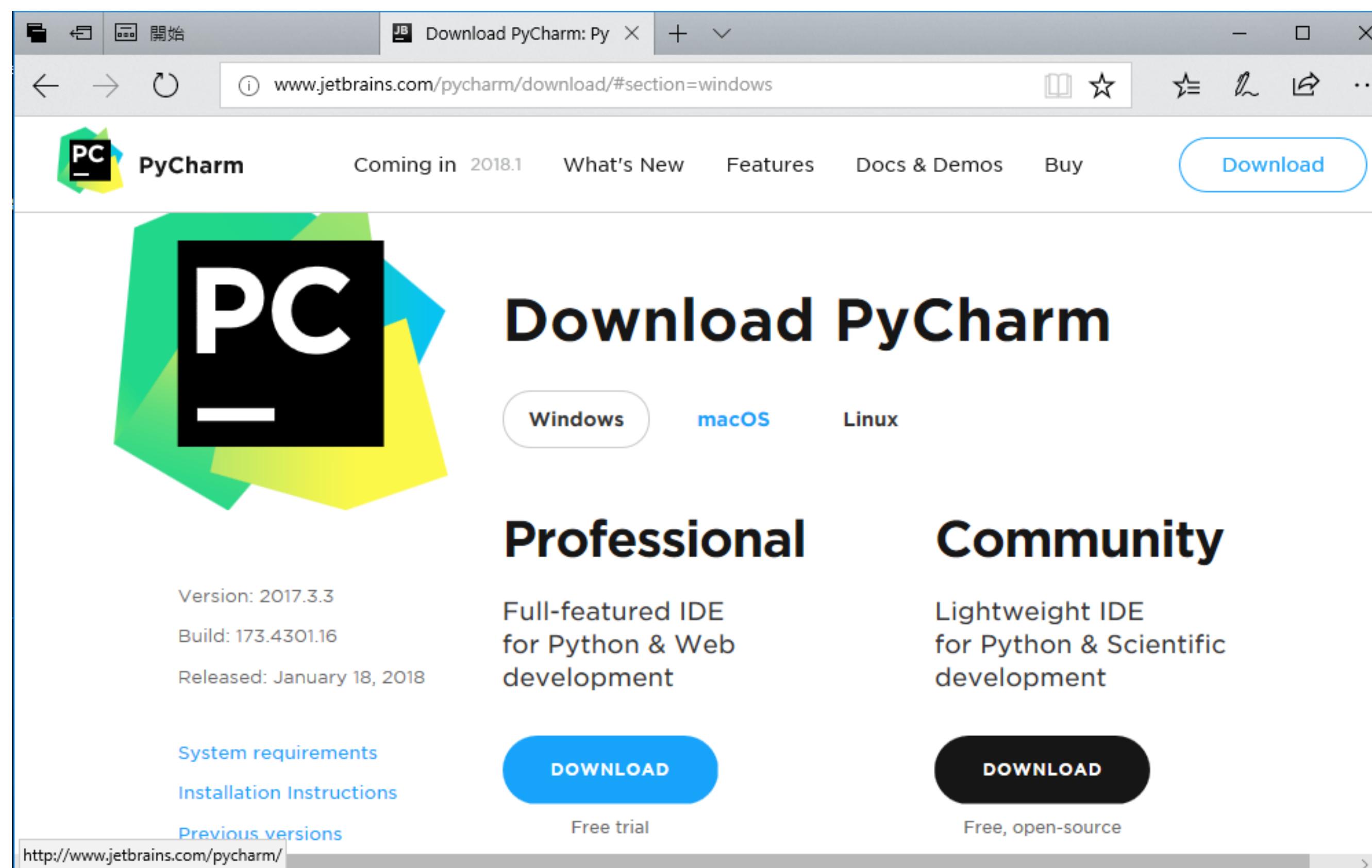


1-3-3在Windows 10下安裝 Pycharm

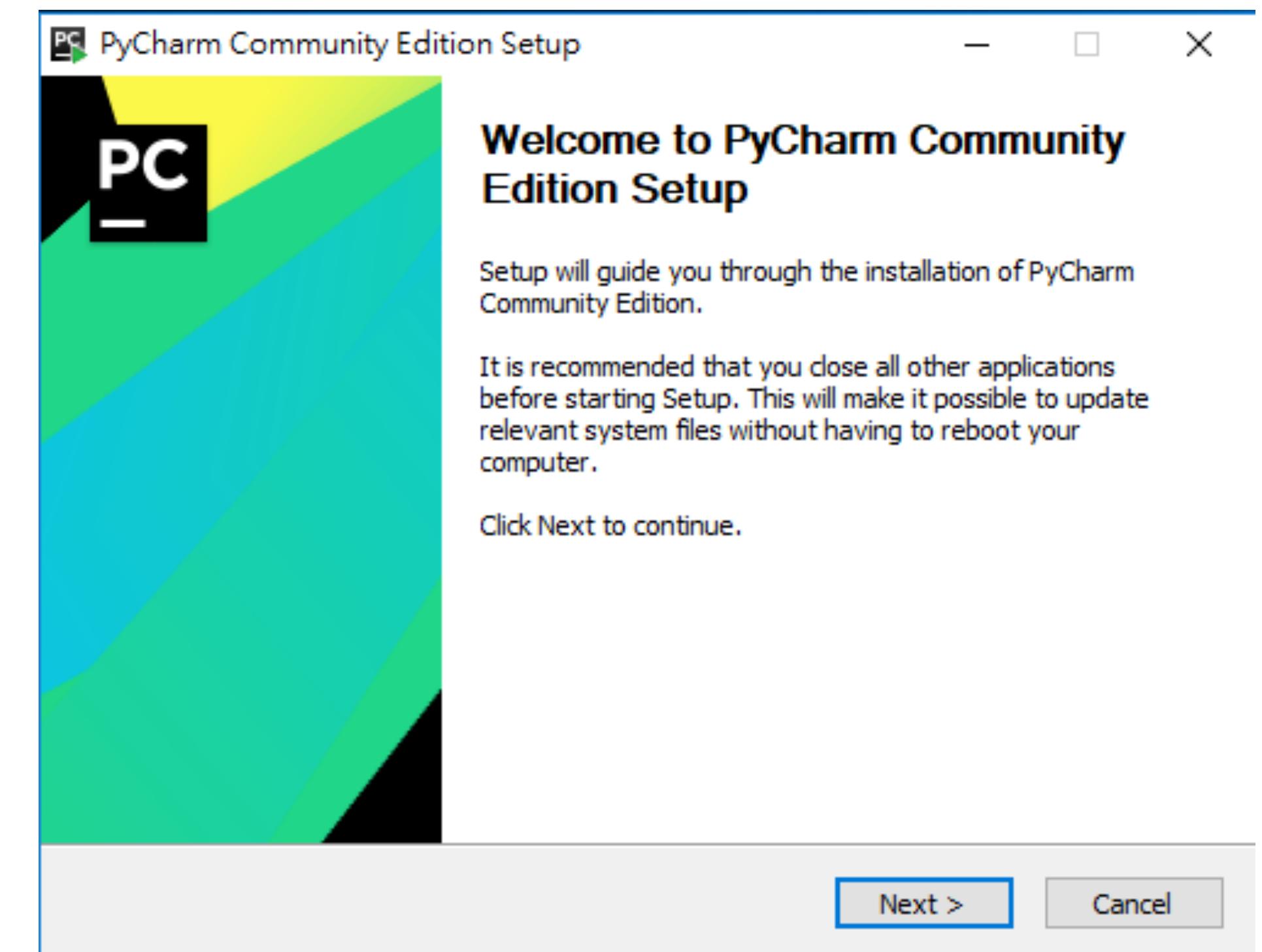
- <https://www.jetbrains.com/pycharm/>



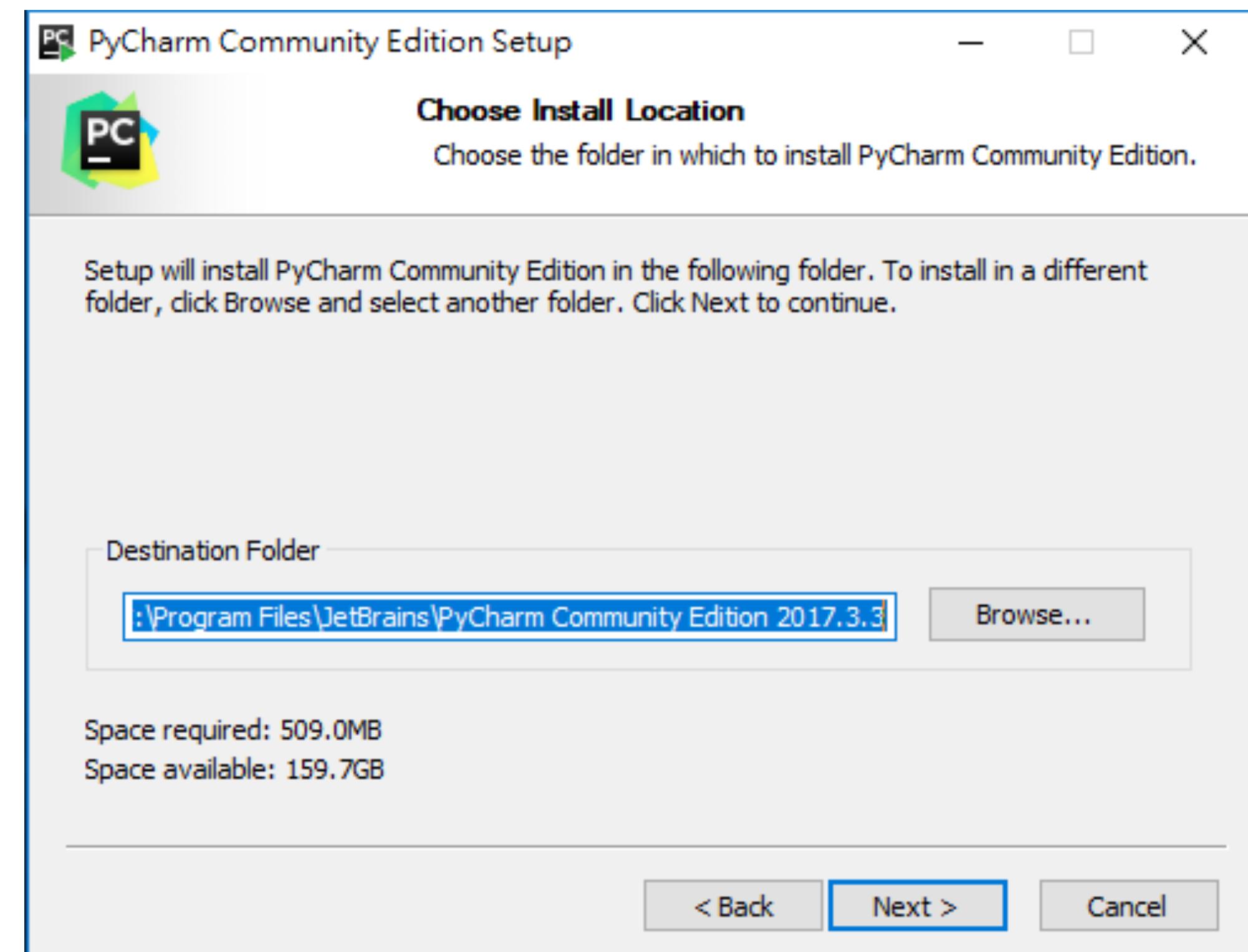
下載Community版



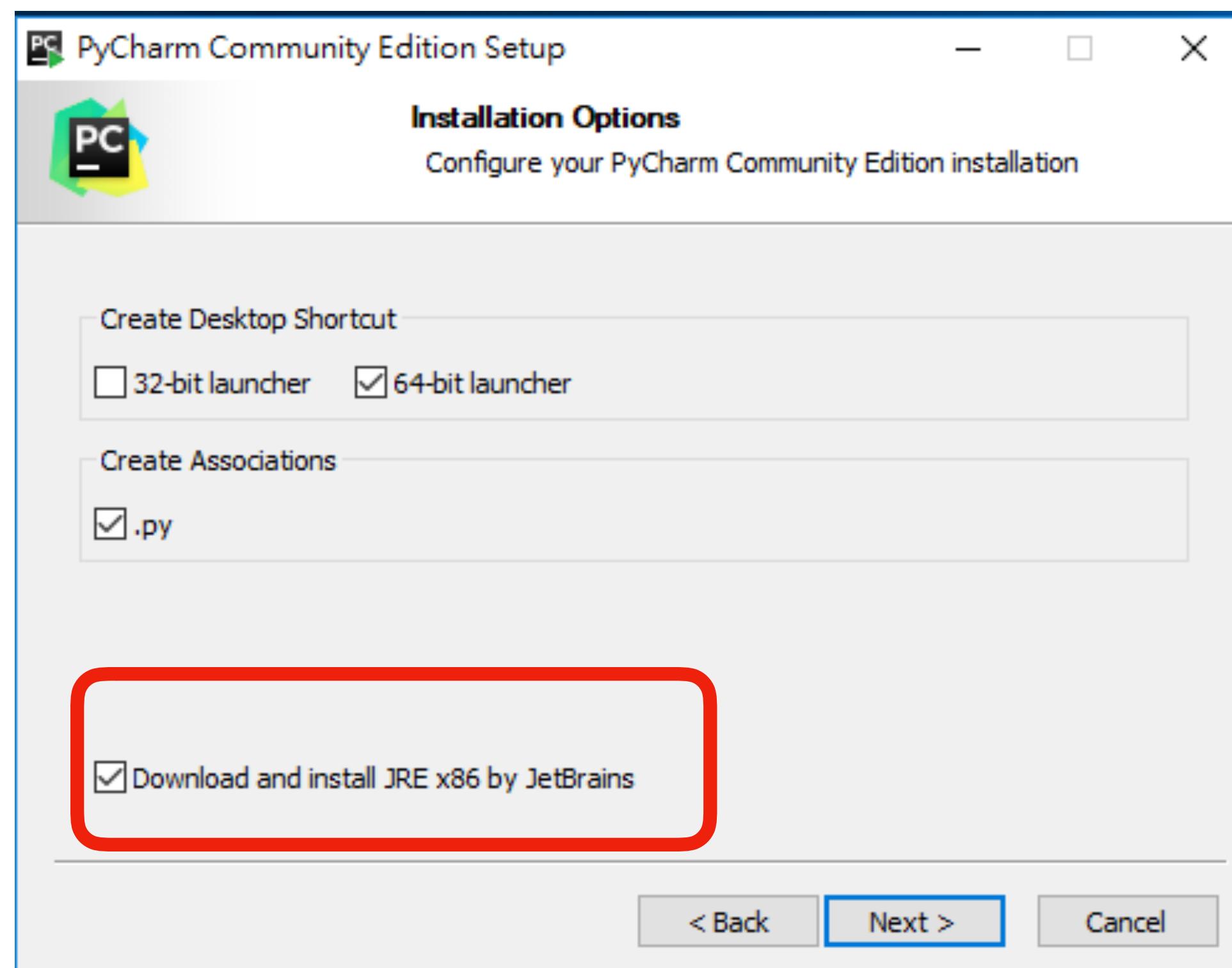
開始安裝PyCharm



選取安裝目錄



選取64位元,和下載JRE



選取安裝

The image displays two screenshots of the PyCharm Community Edition Setup wizard.

Left Screenshot: Choose Start Menu Folder

This screen shows the "Choose Start Menu Folder" step. It includes a title bar with the PyCharm logo and the text "PyCharm Community Edition Setup". Below the title bar is a section titled "Choose Start Menu Folder" with the sub-instruction "Choose a Start Menu folder for the PyCharm Community Edition shortcuts.". A note below this says "Select the Start Menu folder in which you would like to create the program's shortcuts. You can also enter a name to create a new folder." A dropdown menu is open, showing a list of available folders:

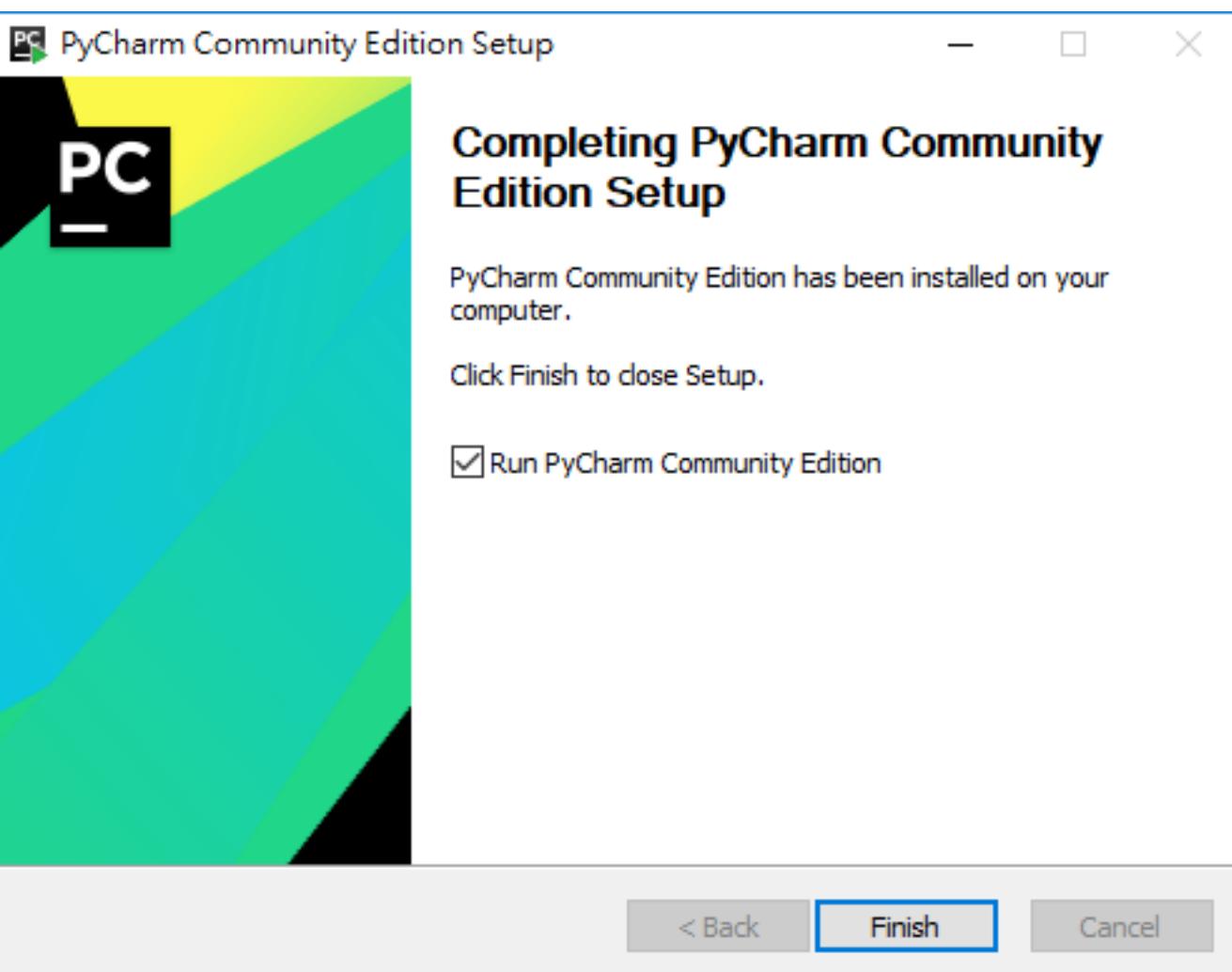
- JetBrains
- 7-Zip
- Accessibility
- Accessories
- Administrative Tools
- Anaconda3 (64-bit)
- Java
- Java Development Kit
- Maintenance
- Microsoft SQL Server 2017
- Microsoft SQL Server Tools 17
- MySQL
- Python 3.6

At the bottom of the screen are three buttons: "< Back", "Install" (which is highlighted in blue), and "Cancel".

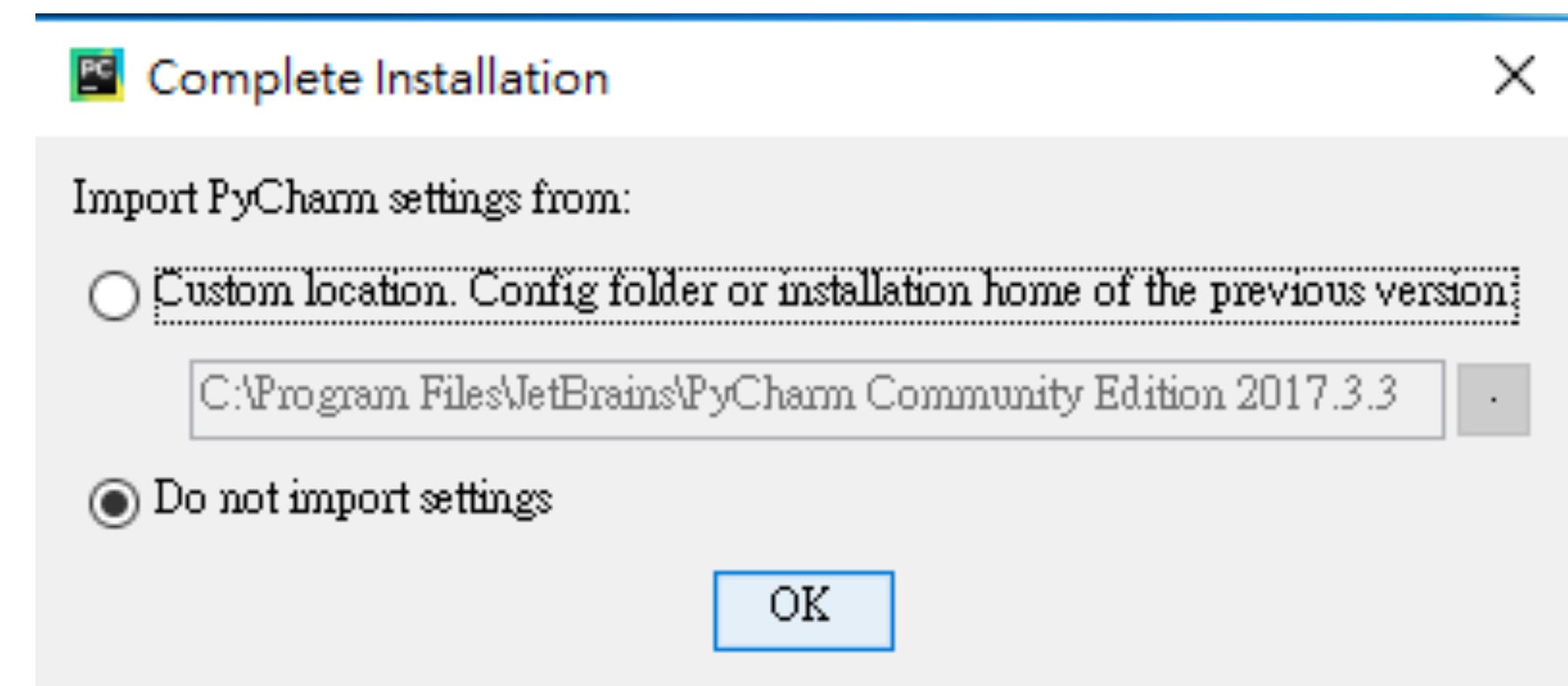
Right Screenshot: Installing

This screen shows the "Installing" step. It has a title bar with the PyCharm logo and the text "PyCharm Community Edition Setup". Below the title bar is a section titled "Installing" with the sub-instruction "Please wait while PyCharm Community Edition is being installed.". A progress bar is visible at the top of the main area. At the bottom of the screen are three buttons: "< Back", "Next >" (disabled), and "Cancel".

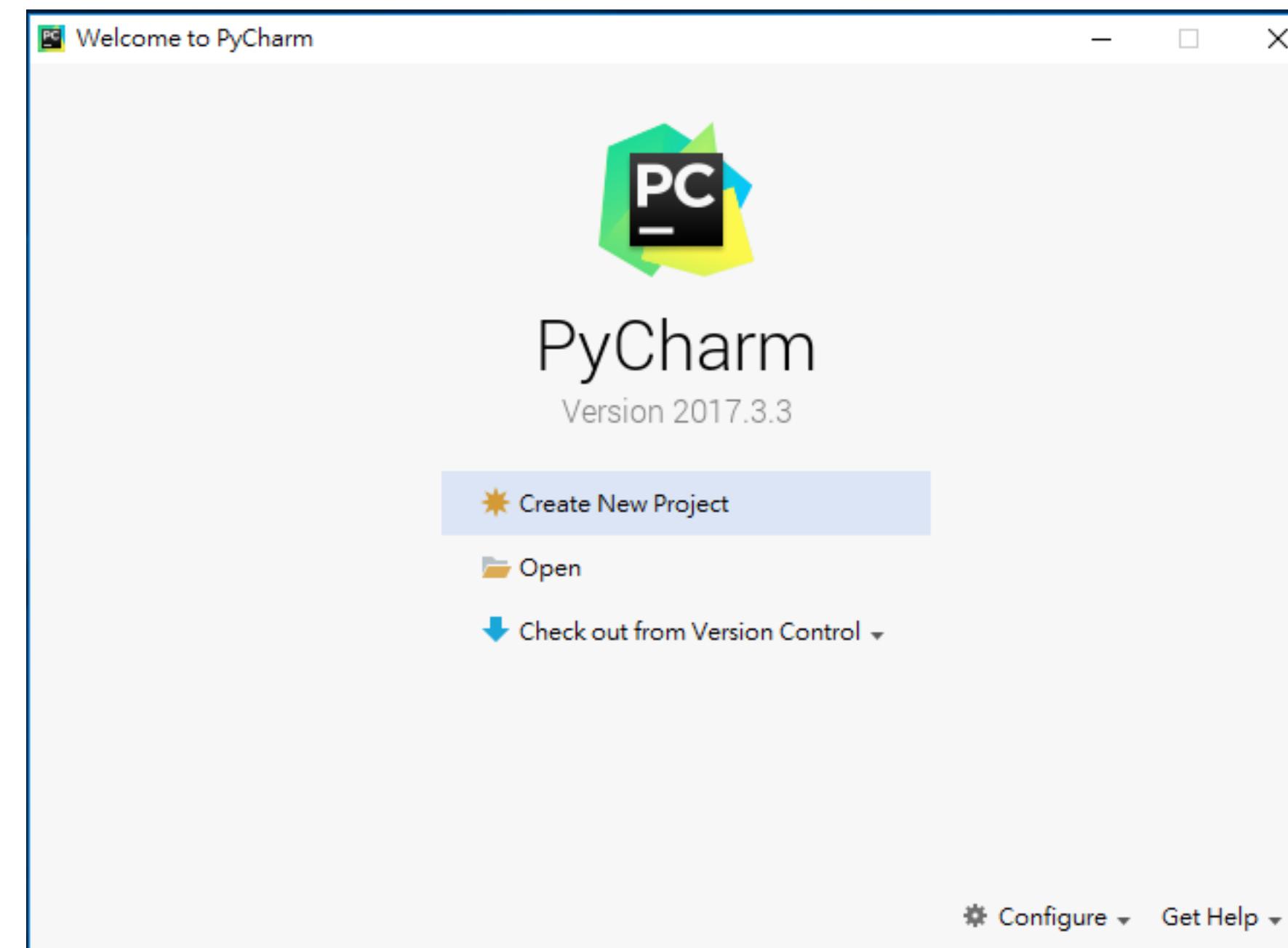
安裝完成



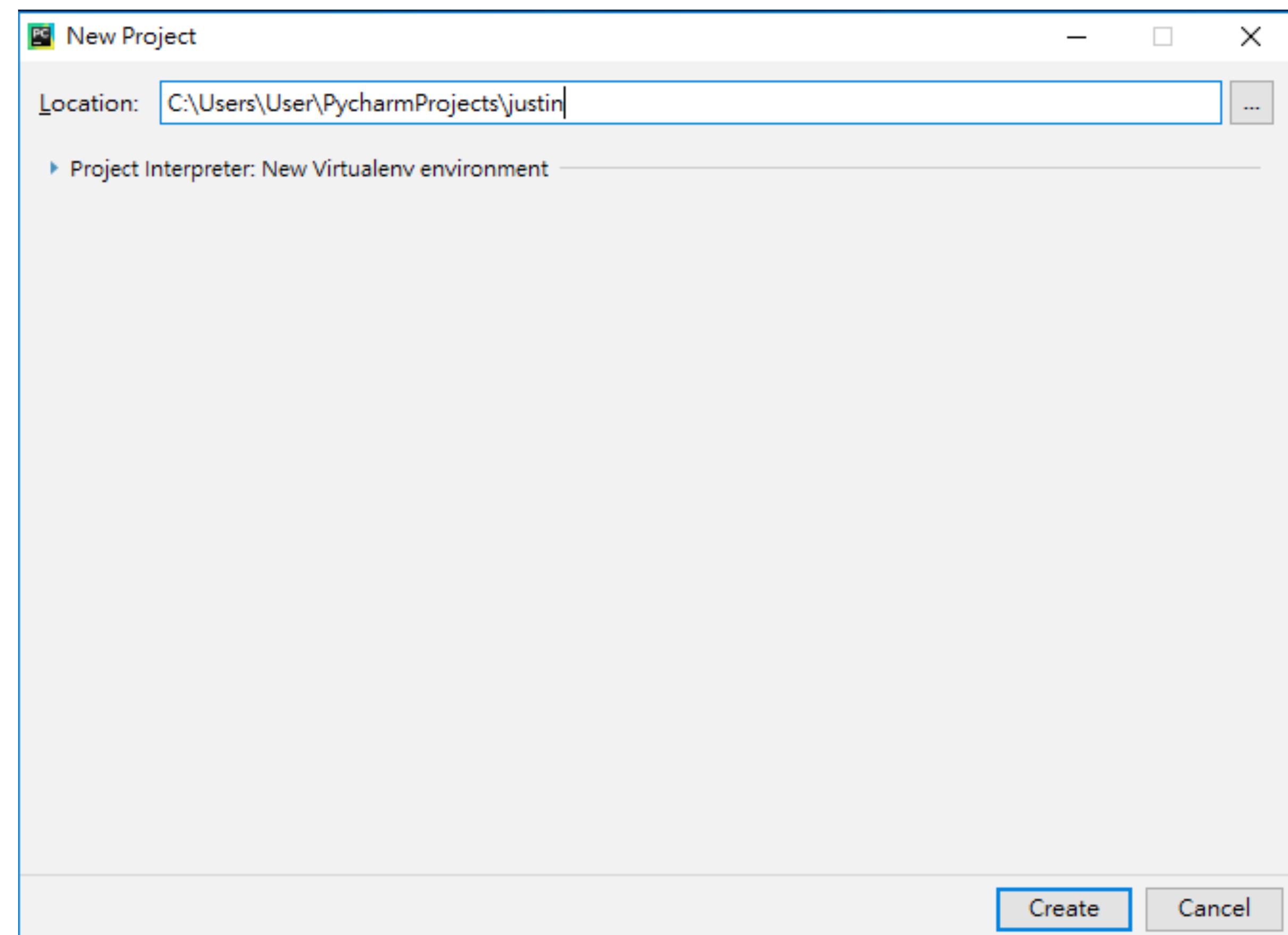
選取OK



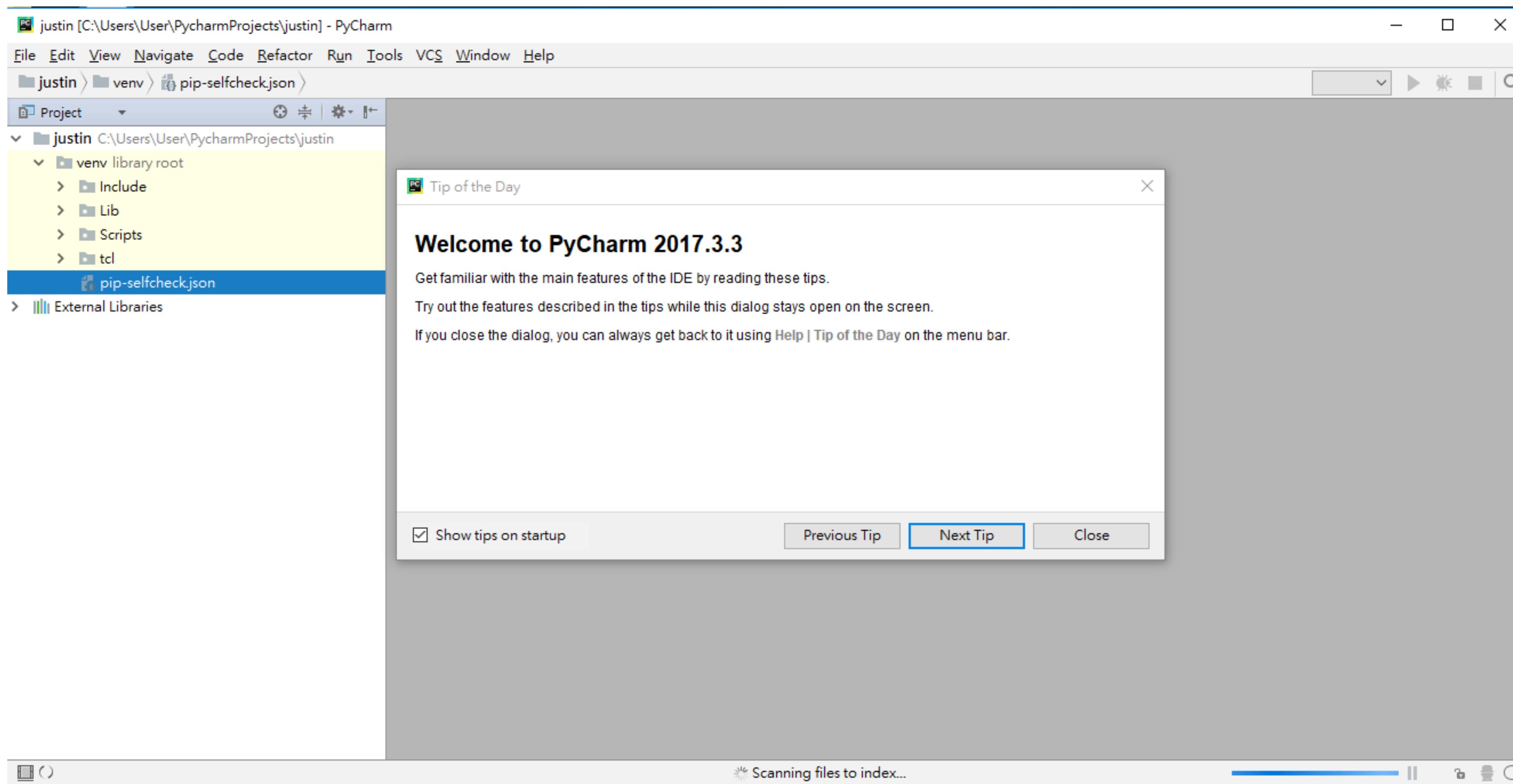
選取建立新Project



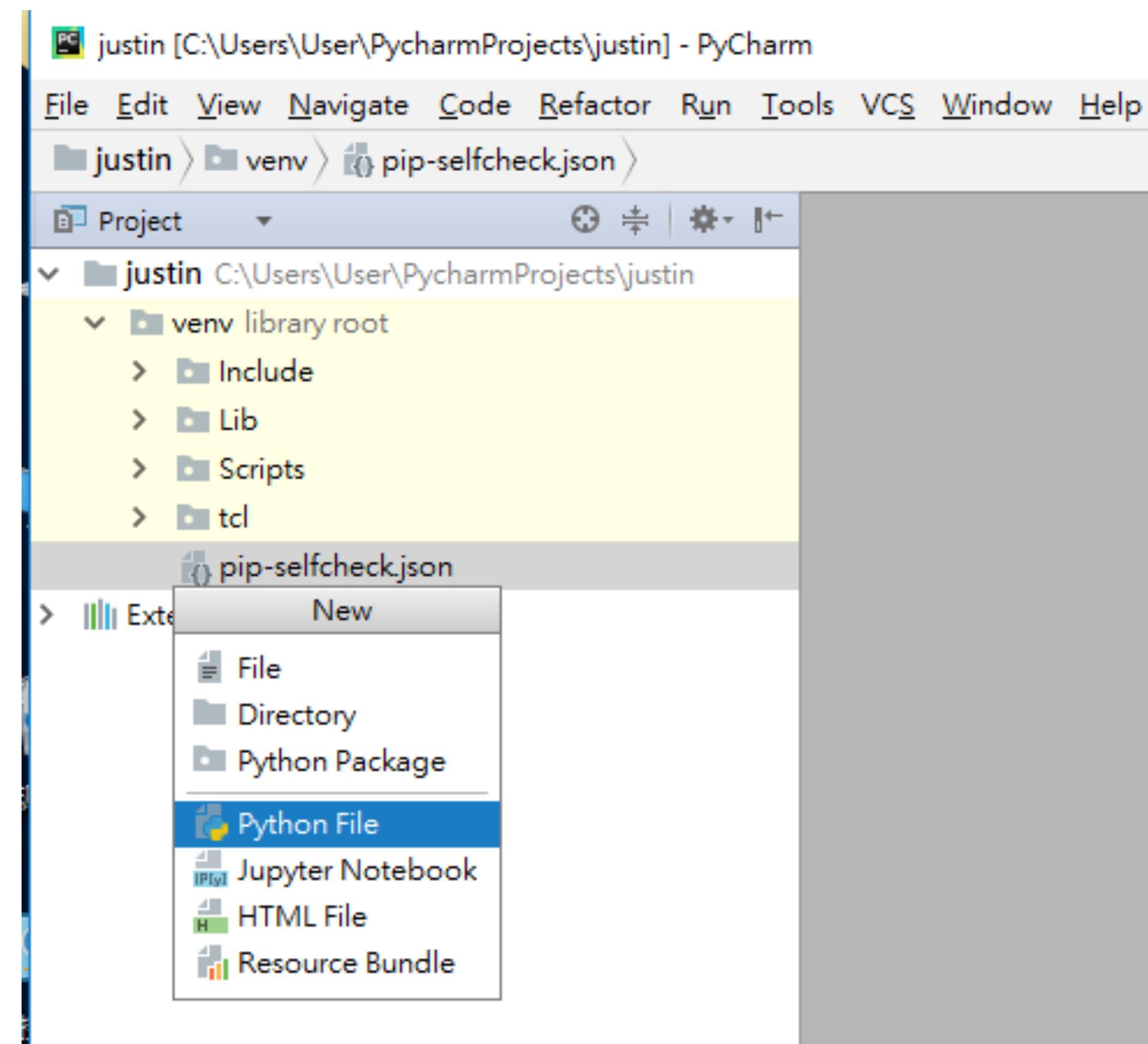
選取建立的目錄



PyCharm歡迎畫面

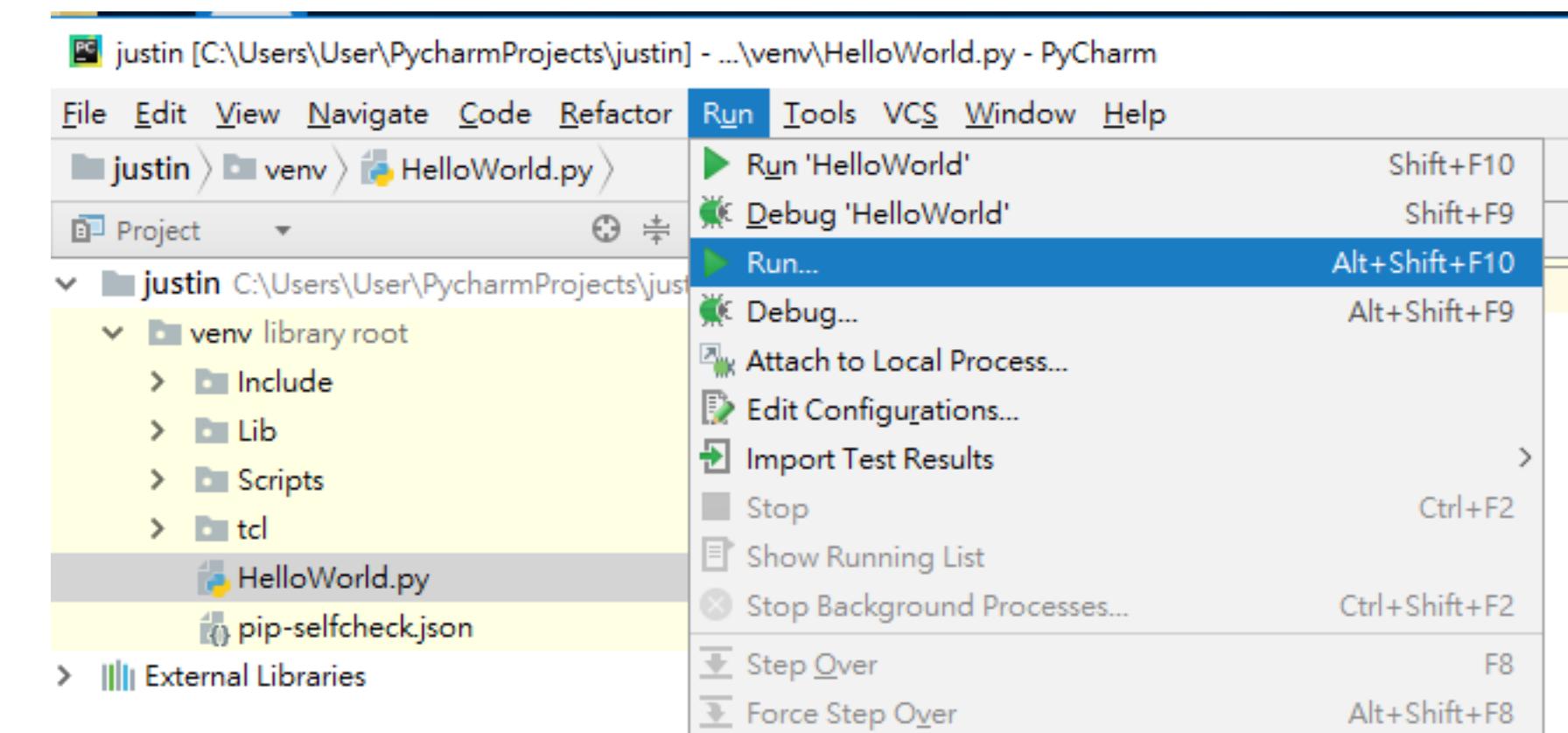
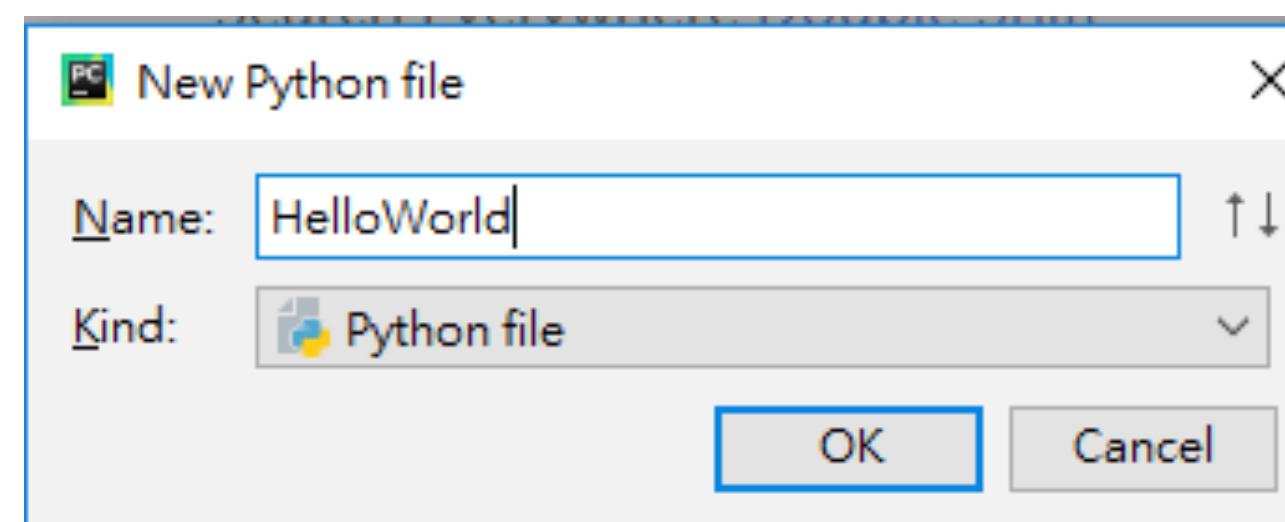


新增Python檔案,選取File->new



檔名儲存為HelloWorld

- 選取Run->Run來執行



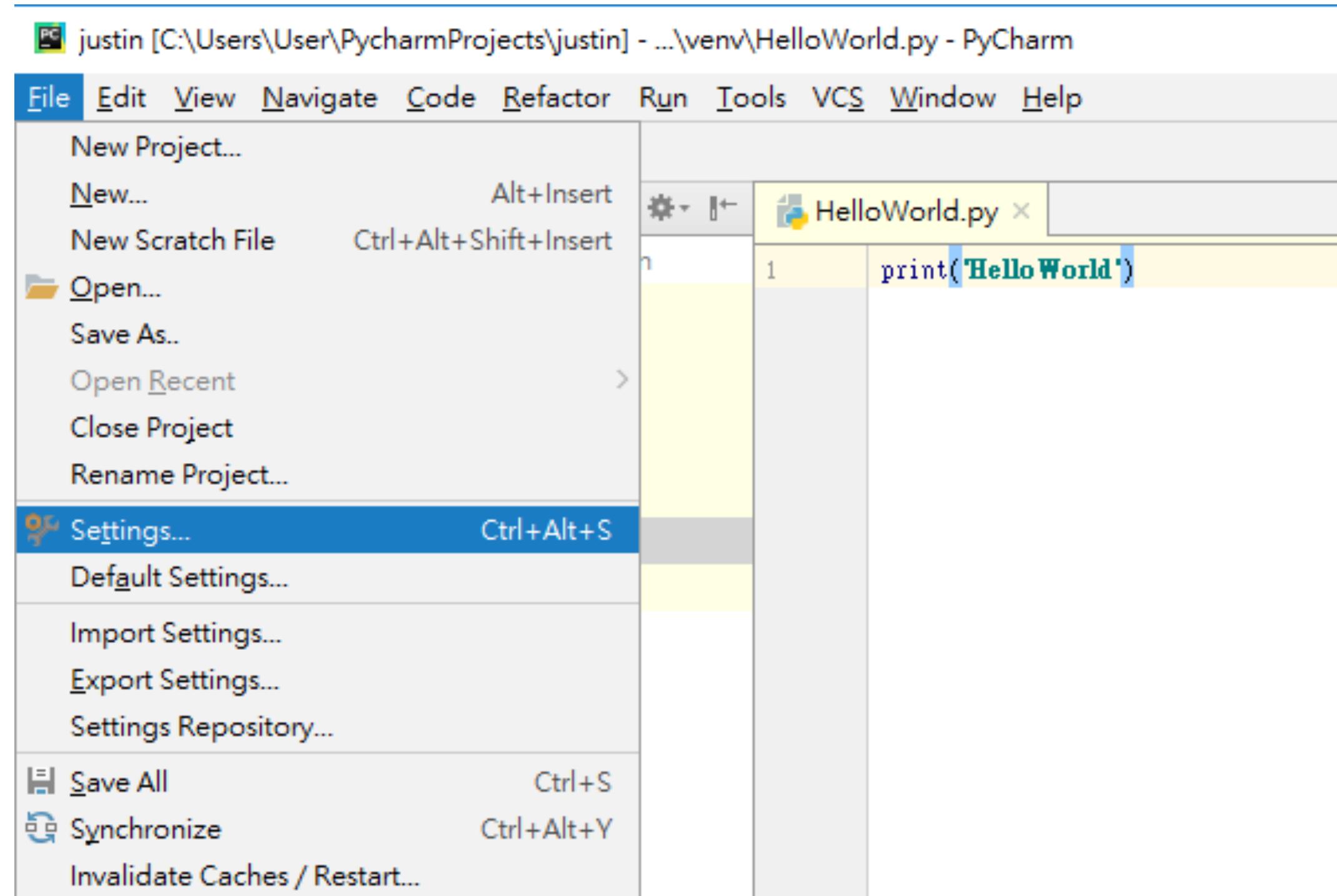
輸入print('HelloWorld')

- 顯示HelloWorld

The screenshot shows the PyCharm IDE interface. The top bar displays the project name "justin" and the file path "C:\Users\User\PycharmProjects\justin - ...\\venv\\HelloWorld.py - PyCharm". The menu bar includes File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window, and Help. The breadcrumb navigation shows "justin > venv > HelloWorld.py". The left sidebar is the Project view, showing the directory structure under "justin" (venv, library root, Include, Lib, Scripts, tcl) and files (HelloWorld.py, pip-selfcheck.json). The main editor window contains the code "print('HelloWorld')". The bottom right corner of the editor has a red box highlighting the code. The bottom panel is the Run tool window, titled "HelloWorld". It shows the command "C:\Users\User\PycharmProjects\justin\venv\Scripts\python.exe C:/Users/User/PycharmProjects/justin/venv>HelloWorld.py" and the output "HelloWorld". Below the output, a message says "Process finished with exit code 0".

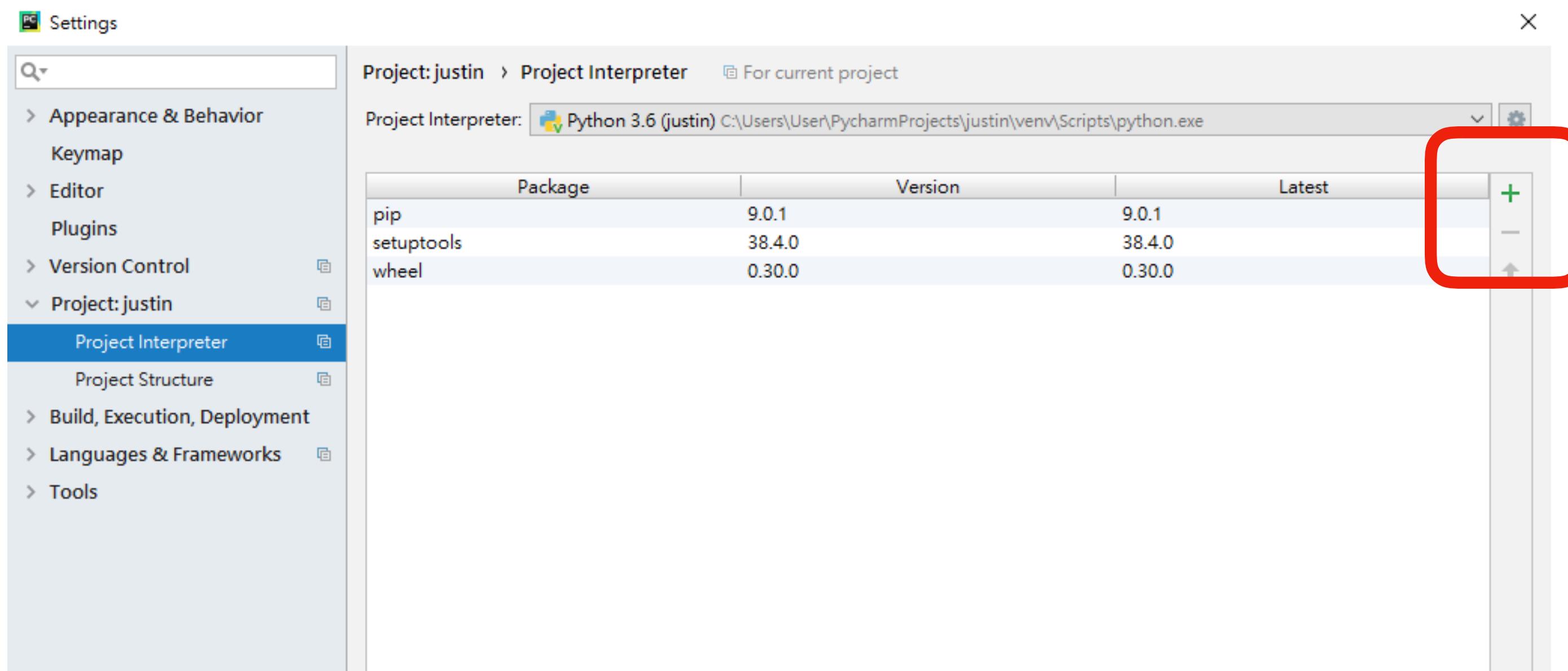
安裝模組

•選取File-Settings

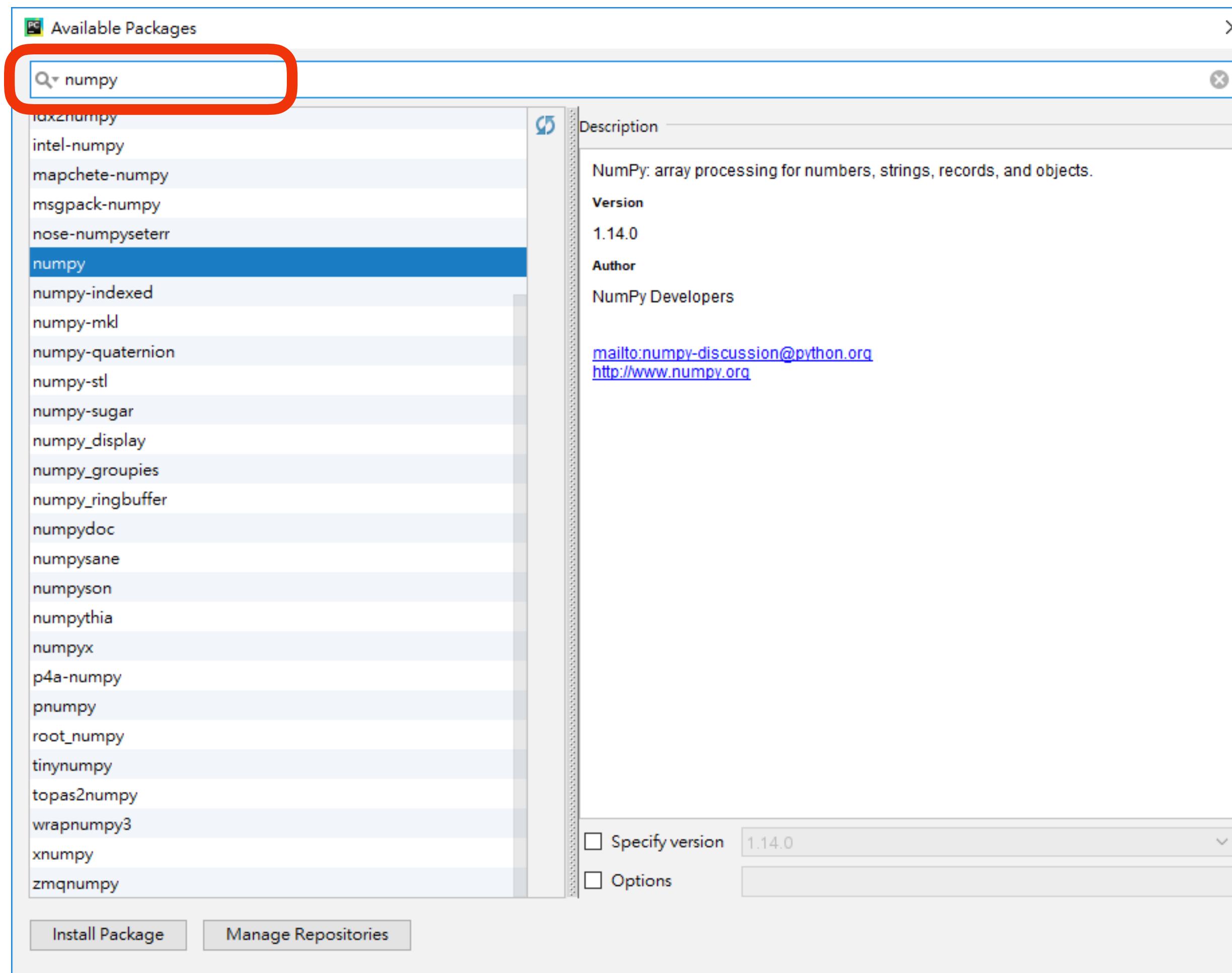


選取Project->直譯器

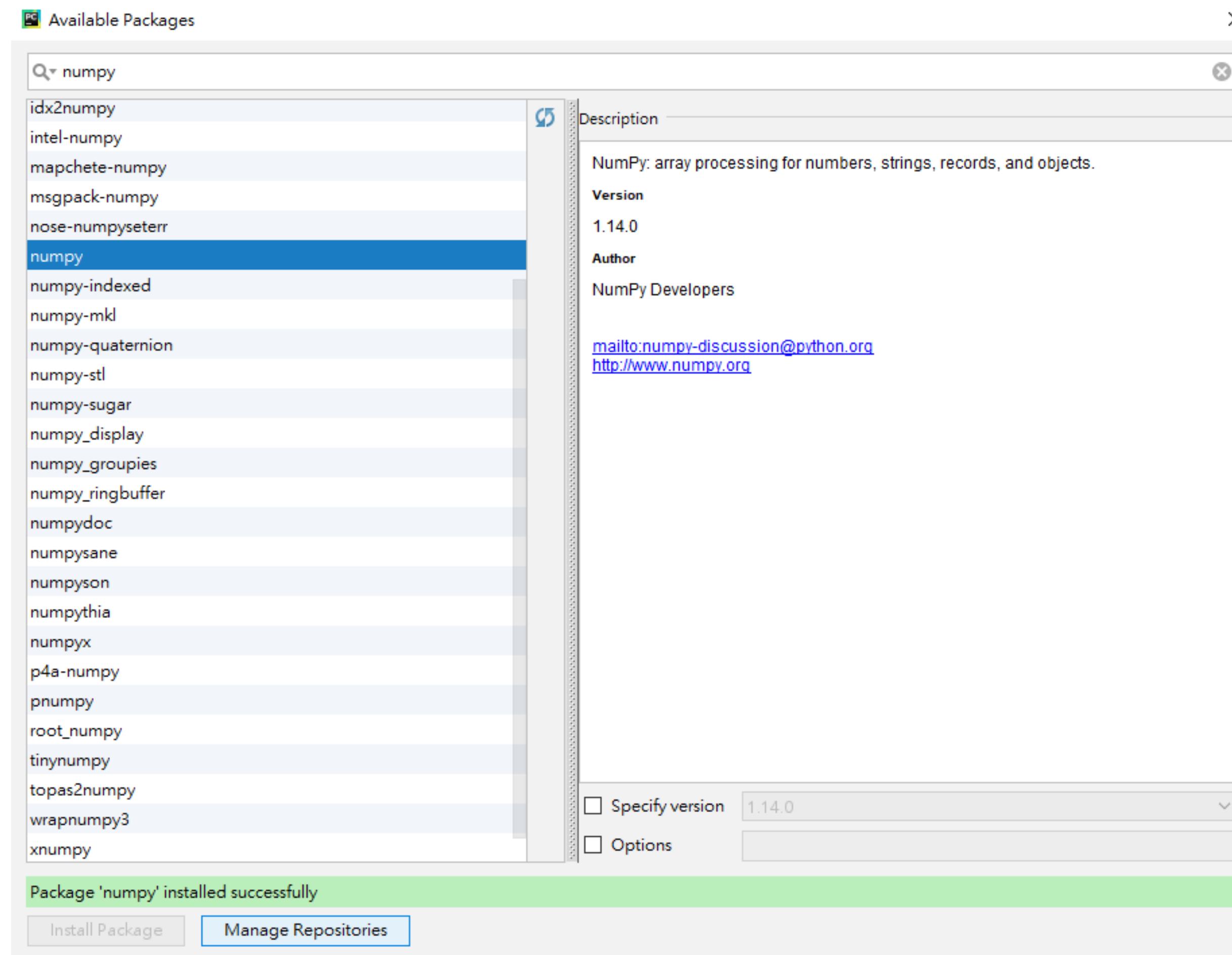
- 選取+來新增模組

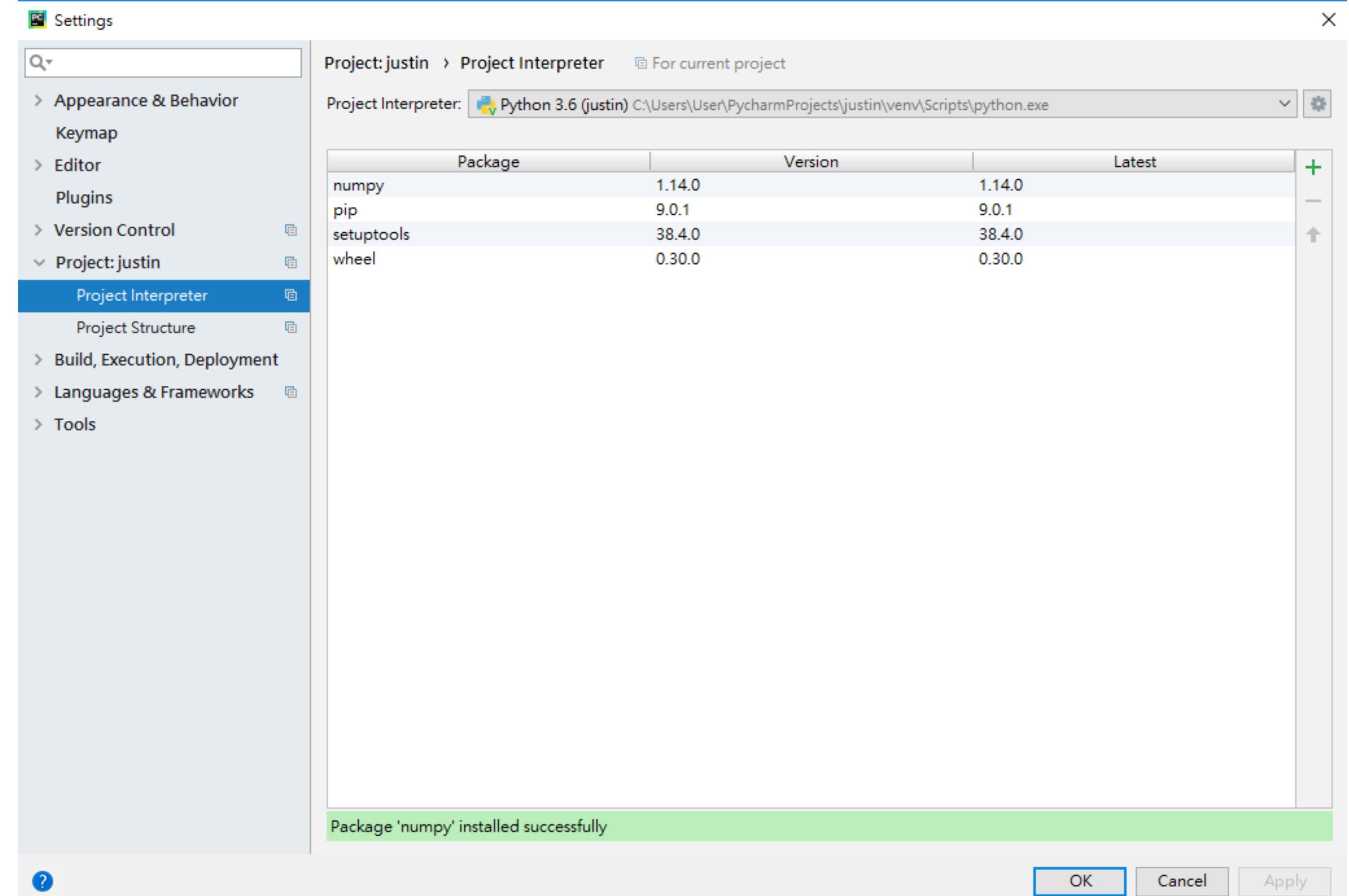


輸入要安裝模組名稱

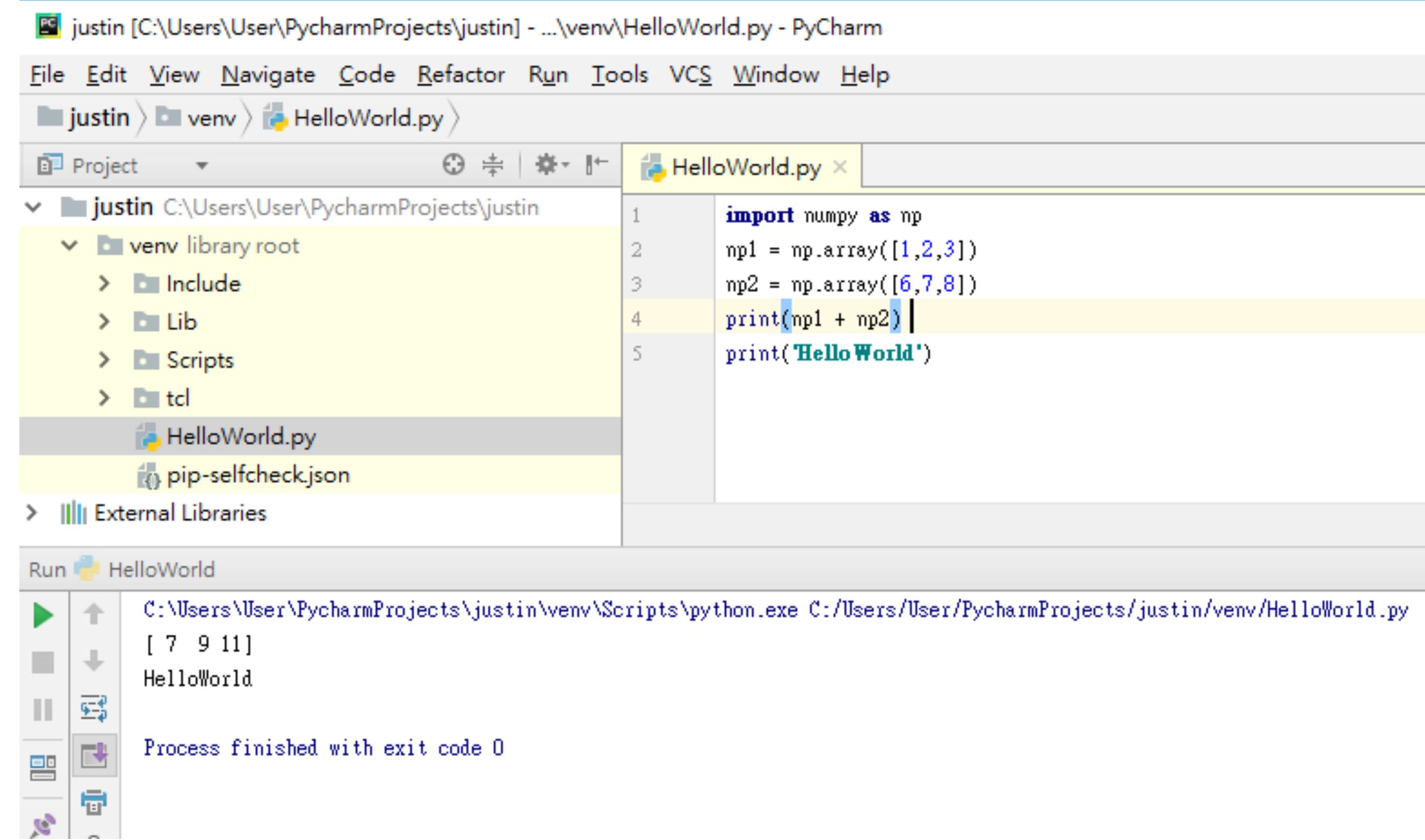


已安裝numpy模組





成功執行



A screenshot of the PyCharm IDE interface. The title bar shows "justin [C:\Users\User\PycharmProjects\justin] - ...\\venv\\HelloWorld.py - PyCharm". The menu bar includes File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window, and Help. The breadcrumb navigation shows "justin > venv > HelloWorld.py". The left sidebar is the Project view, showing a hierarchy of files: justin (C:\Users\User\PycharmProjects\justin), venv (library root), and HelloWorld.py. The main editor window displays the following Python code:

```
import numpy as np
np1 = np.array([1,2,3])
np2 = np.array([6,7,8])
print(np1 + np2)
print('HelloWorld')
```

The Run tool window at the bottom shows the output of running the script:

```
C:\Users\User\PycharmProjects\justin\venv\Scripts\python.exe C:/Users/User/PycharmProjects/justin/venv>HelloWorld.py
[ 7  9 11]
HelloWorld
Process finished with exit code 0
```



- Thanks.

