

RWEPA | 程式設計 Python

02_Anaconda_JupyterNotebook_Spyder簡介 Business Data Analytics

- 按訂閱、讚、開啟小鈴鐺
- <https://youtube.com/@alan9956>
- <http://rwepa.blogspot.com/>



大綱

2.1 Anaconda 簡介

2.2 Anaconda 下載與安裝

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2.6 Jupyter notebook 互動式程式設計平台

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2.8 conda 虛擬環境

2.1 Anaconda 簡介



Anaconda 特性

- Anaconda是一個免費、易於安裝/管理並支援Python語言，已經安裝315個以上模組：
 - beautifulsoup4 網路爬蟲
 - bokeh 視覺化(D3.js)
 - Flask 網頁開發
 - matplotlib 視覺化
 - numpy 多維陣列與矩陣運算
 - pandas 資料匯入、操作、視覺化
 - scikit-learn 機器學習
 - scipy 最佳化、線性代數、積分、微分方程式
 - seaborn 統計繪圖
 - statsmodels 統計模型
 - openpyxl Excel 檔案處理

Anaconda 特性 (續)

- 支援7500個以上的資料科學模組 (package)
- 支援模組的下載, 安裝, 更新
- 支援 Spyder (支援 Python IDE)
- 支援 Jupyter notebook
- 支援 Windows、Mac OS X和Linux

Anaconda 特性 (續)

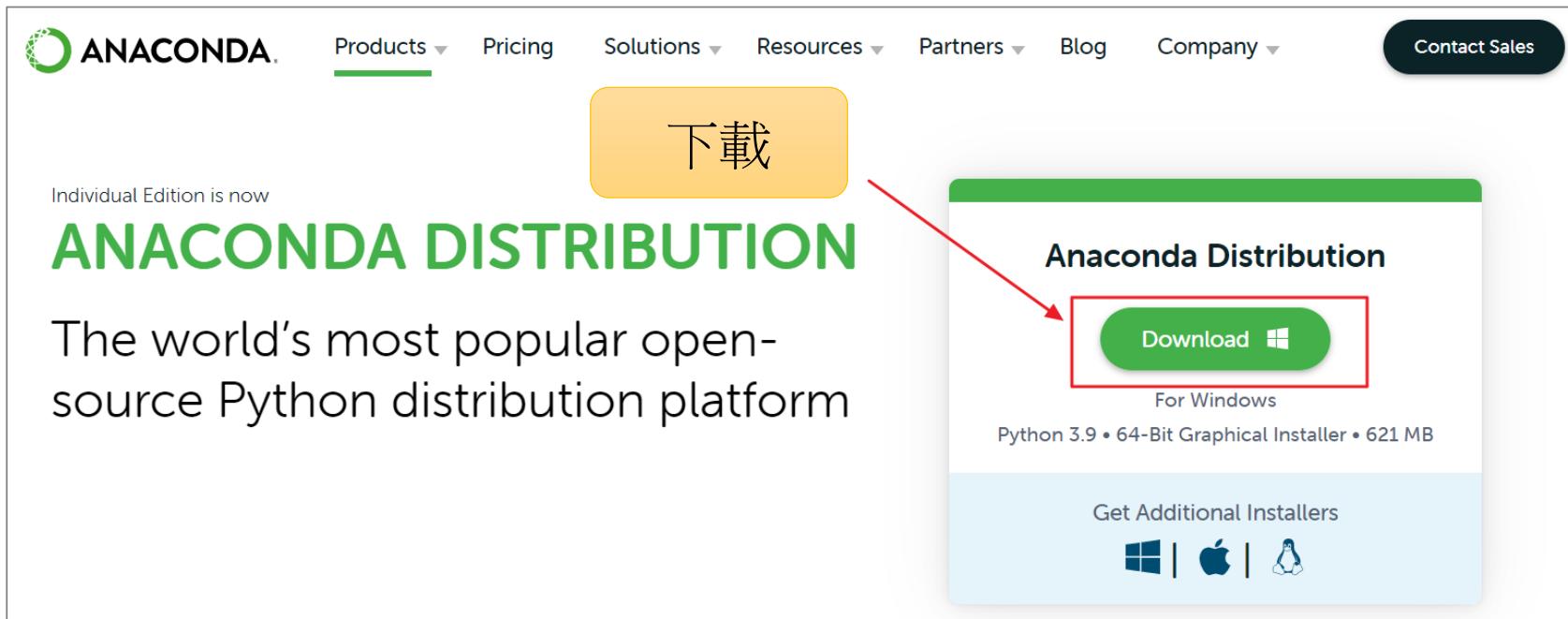


source: <https://www.anaconda.com/distribution/>

2.2 Anaconda 下載與安裝

Anaconda 下載

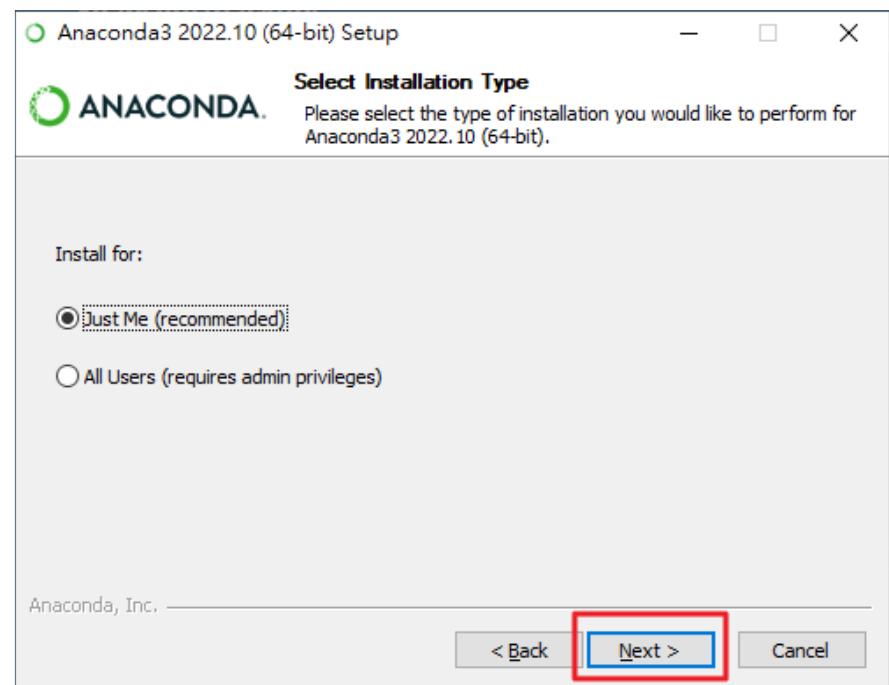
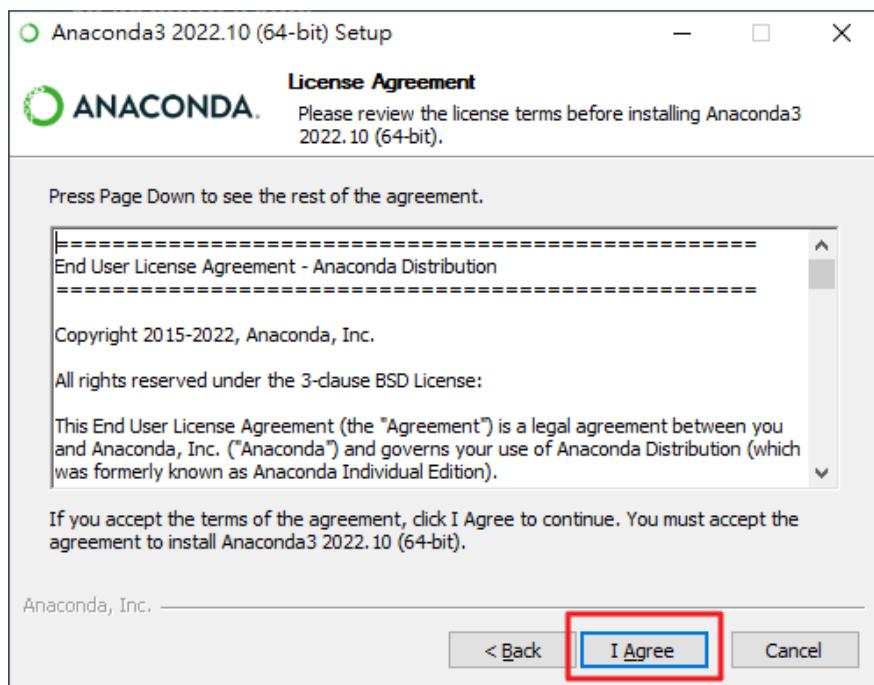
- <https://www.anaconda.com/>
- Anaconda3-2022.10-Windows-x86_64.exe (621MB)



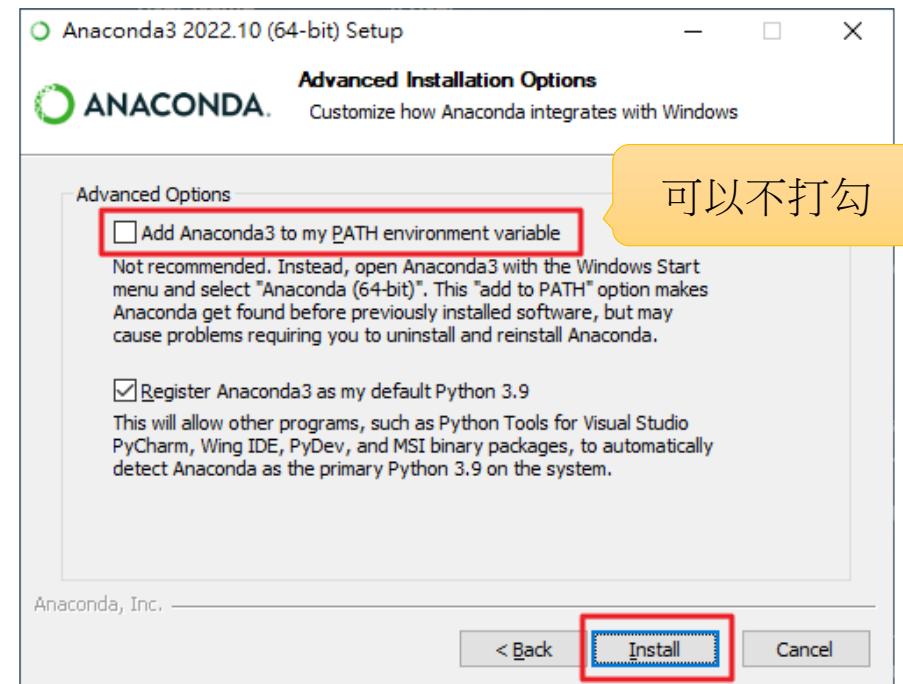
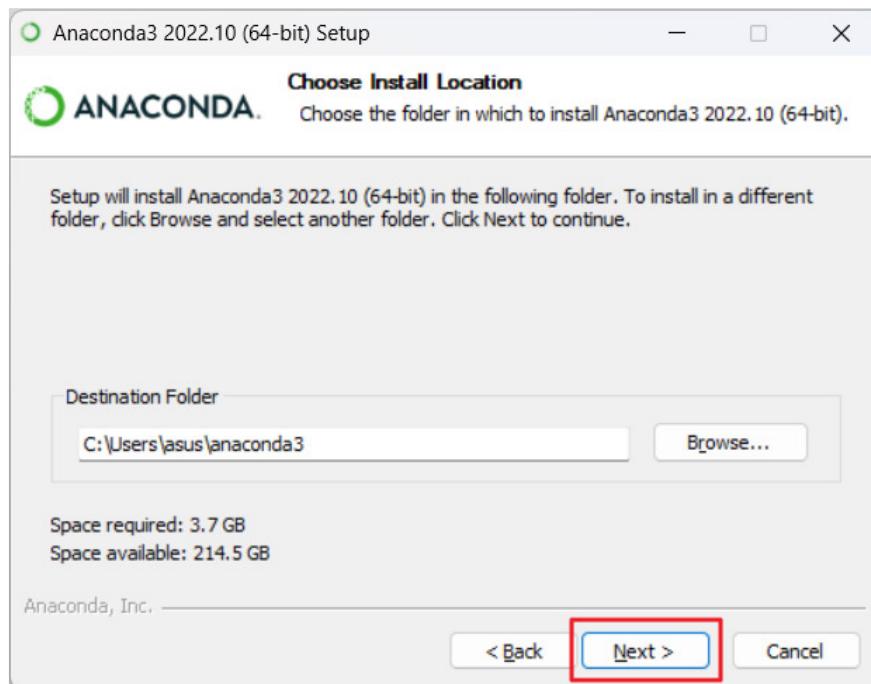
安裝 Anaconda



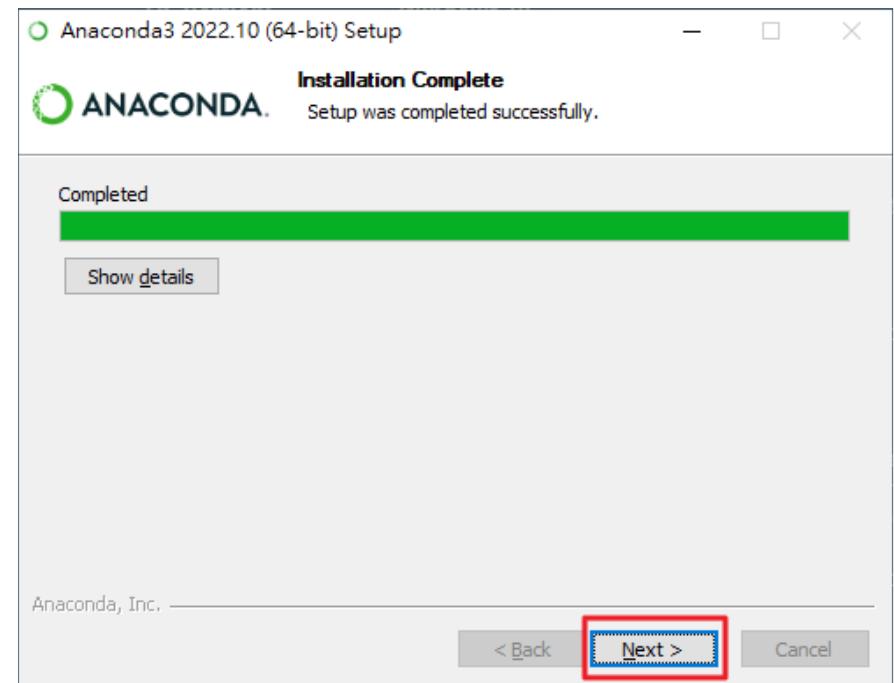
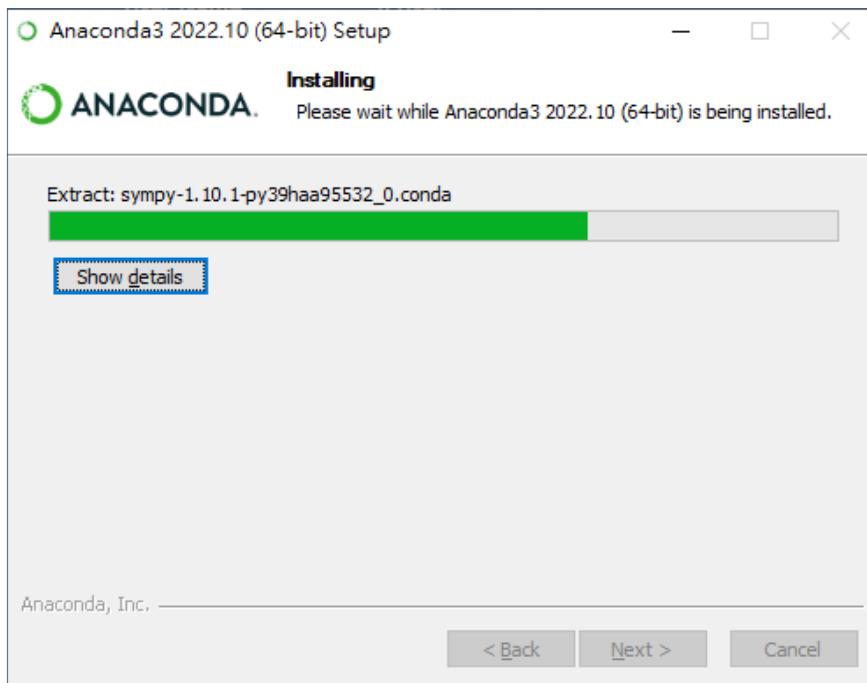
安裝畫面



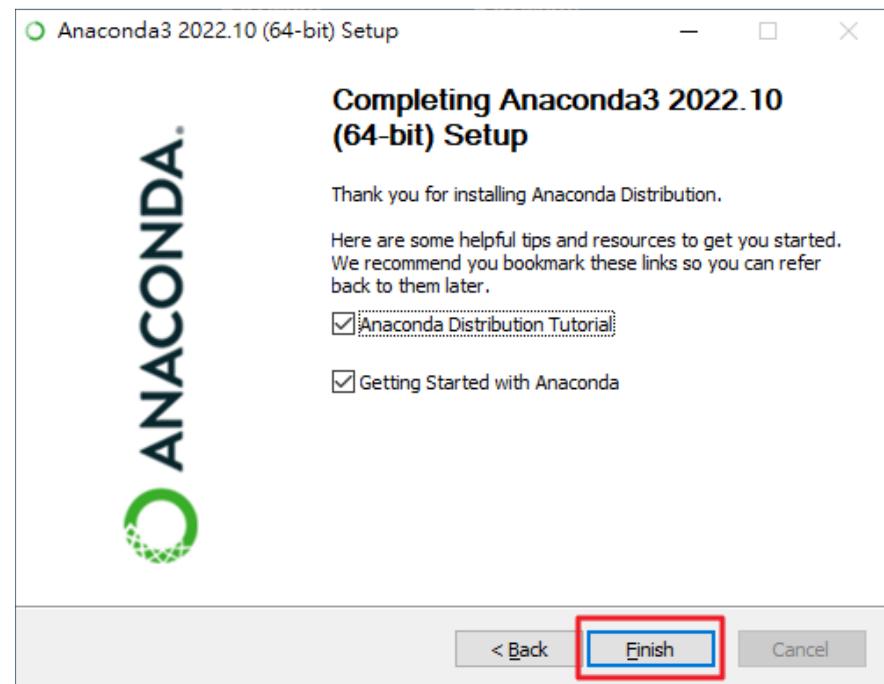
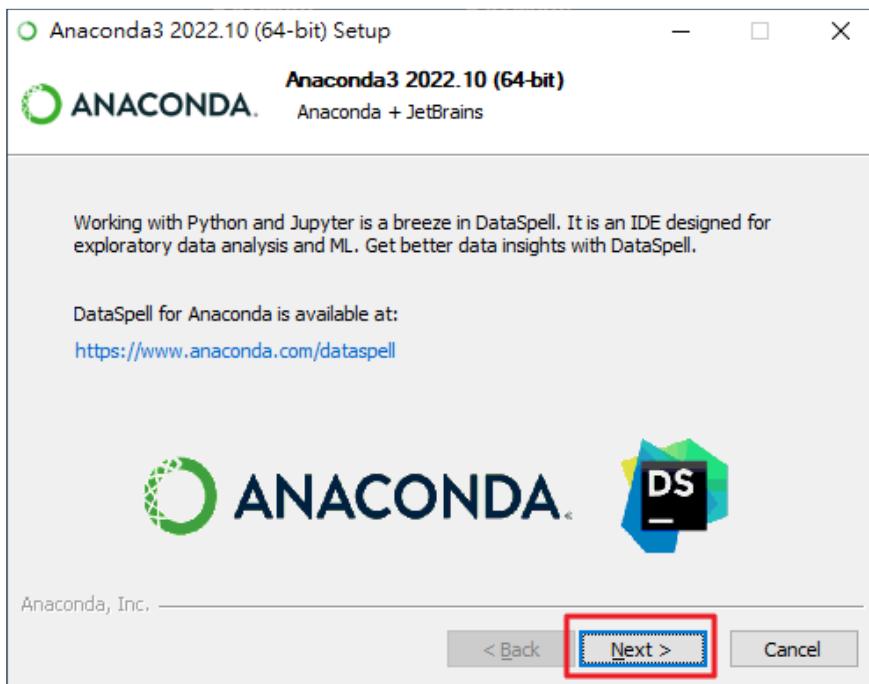
二個選項都打勾



安裝畫面



安裝畫面



Anaconda 安裝完成

The screenshot shows a web browser window with two tabs: "Getting Started with Anaconda" and "Anaconda | Installation Success". The main content is titled "Installation Success" and "Welcome to Anaconda!". It encourages users to create a free Anaconda Nucleus account for resources. A sidebar promotes "Anaconda Notebooks" with a "Learn More" button. A chatbot at the bottom right offers assistance.

Getting Started with Anaconda × Anaconda | Installation Success × +

anaconda.com/products/distribution/installation-success

ANACONDA.

Contact Sales

Installation Success

Welcome to Anaconda!

Here are some useful resources to help you get started.

Create your free [Anaconda Nucleus](#) account today to get access to training materials, how-to videos, and expert insights,

This website uses cookies to ensure you get the best experience on our website. [Privacy Policy](#).

Anaconda Notebooks

Skip the install button. Start coding immediately.

Learn More

Hey! 🎉 Welcome to Anaconda. I'm here to help. What are you looking for today?

Accept

Anaconda3 (64-bit)



2.3 Anaconda Navigator 圖形化 conda 管理工具

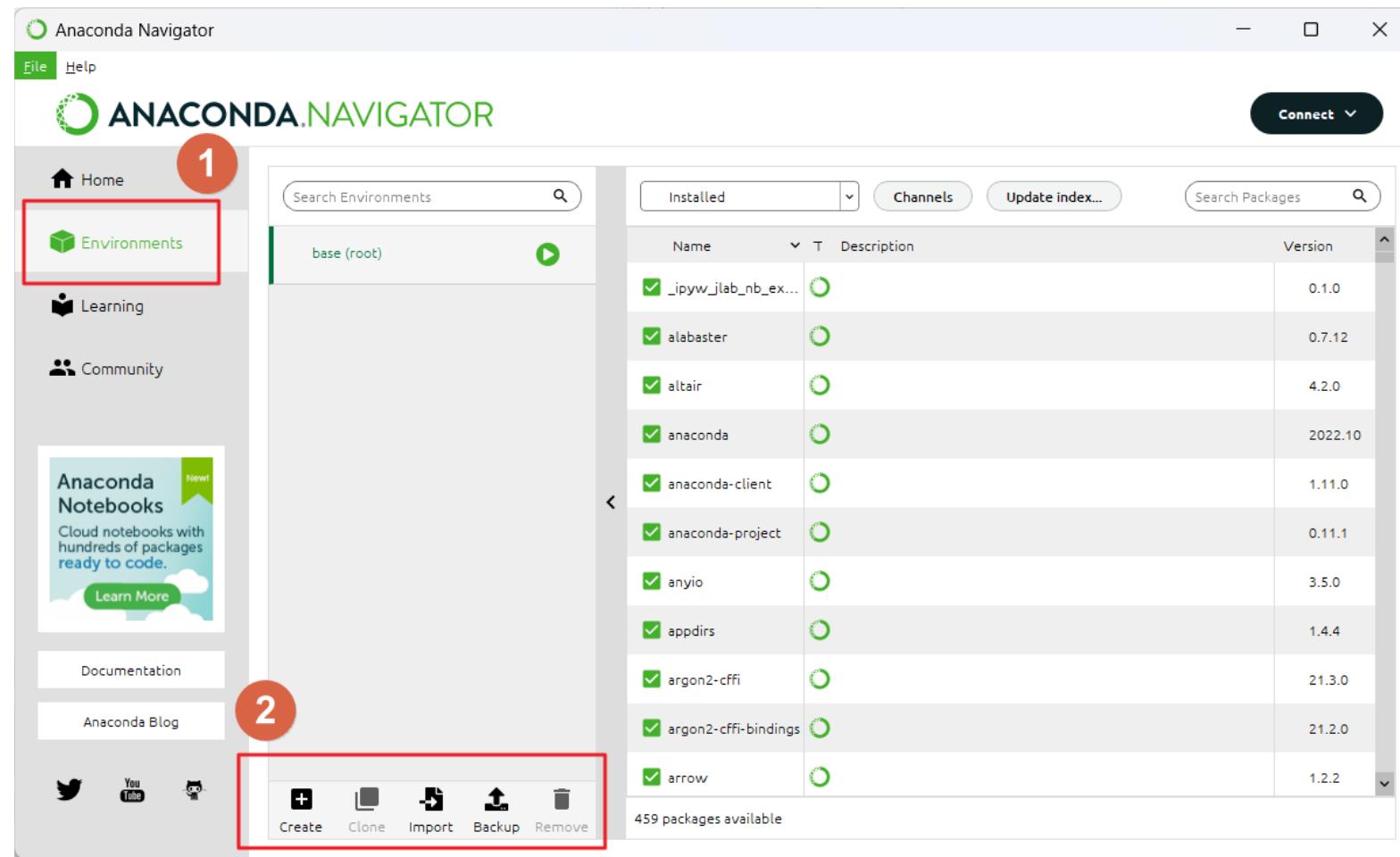
Anaconda Navigator

The screenshot shows the Anaconda Navigator interface. On the left is a sidebar with links to Home, Environments, Learning, Community, and Anaconda NUCLEUS (Join Now). The main area displays a grid of application icons, each with a 'Launch' or 'Install' button. A yellow callout bubble in the top right says '不同電腦, 安裝模組可能有差異'. Another yellow callout bubble at the bottom left says '注意: 不要在此安裝 RStudio, 可能會有錯誤?'. A third yellow callout bubble on the bottom right lists 'Launch' and 'Install' options.

Application	Description	Action
CMD.exe Prompt	Run a cmd.exe terminal with your current environment from Navigator activated	Launch
Datalore	Online Data Analysis Tool with smart coding assistance by JetBrains. Edit and run your Python notebooks in the cloud and share them with your team.	Launch
IBM Watson Studio Cloud	IBM Watson Studio Cloud provides you the tools to analyze and visualize data, to cleanse and shape data, to create and train machine learning models. Prepare data and build models, using open source data science tools or visual modeling.	Launch
JupyterLab	An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.	Launch
Jupyter Notebook	Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.	Launch
Powershell Prompt	Run a Powershell terminal with your current environment from Navigator activated	Launch
IPy	PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.	Launch
Qt Console	PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.	Launch
Spyder	Scientific Python Development Environment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features.	Launch
VS Code	Streamlined code editor with support for development operations like debugging, task running and version control.	Launch
Glueviz	Multidimensional data visualization across files. Explore relationships within and among related datasets.	Install
Orange 3	Component based data mining framework. Data visualization and data analysis for novice and expert. Interactive workflows with a large toolbox.	Install
PyCharm Professional	A full-fledged IDE by JetBrains for both Scientific and Web Python development. Supports HTML, JS, and SQL.	Install
RStudio	A set of integrated tools designed to help you be more productive with R. Includes R essentials and notebooks.	Install

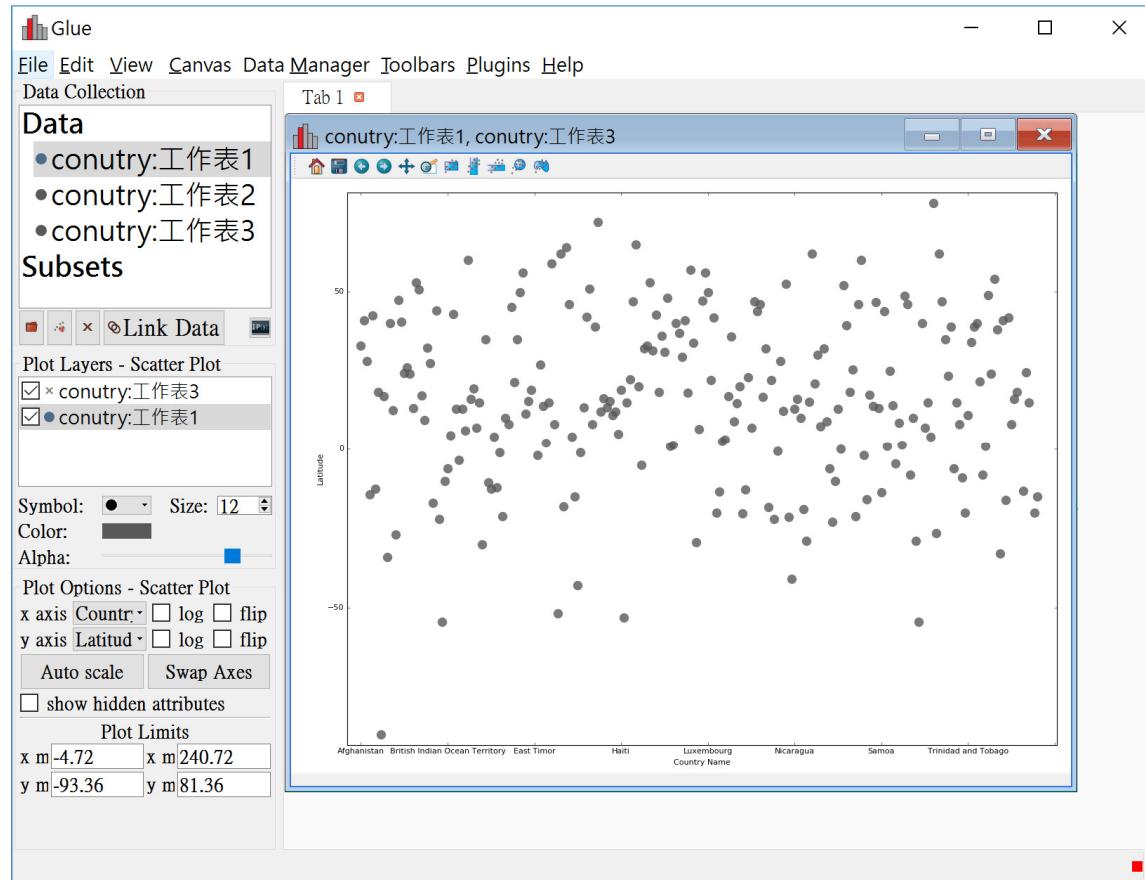
- Launch : 可以直接啟動
- Install : 須安裝

Anaconda Navigator \ Environments



2.4 Glueviz 視覺化

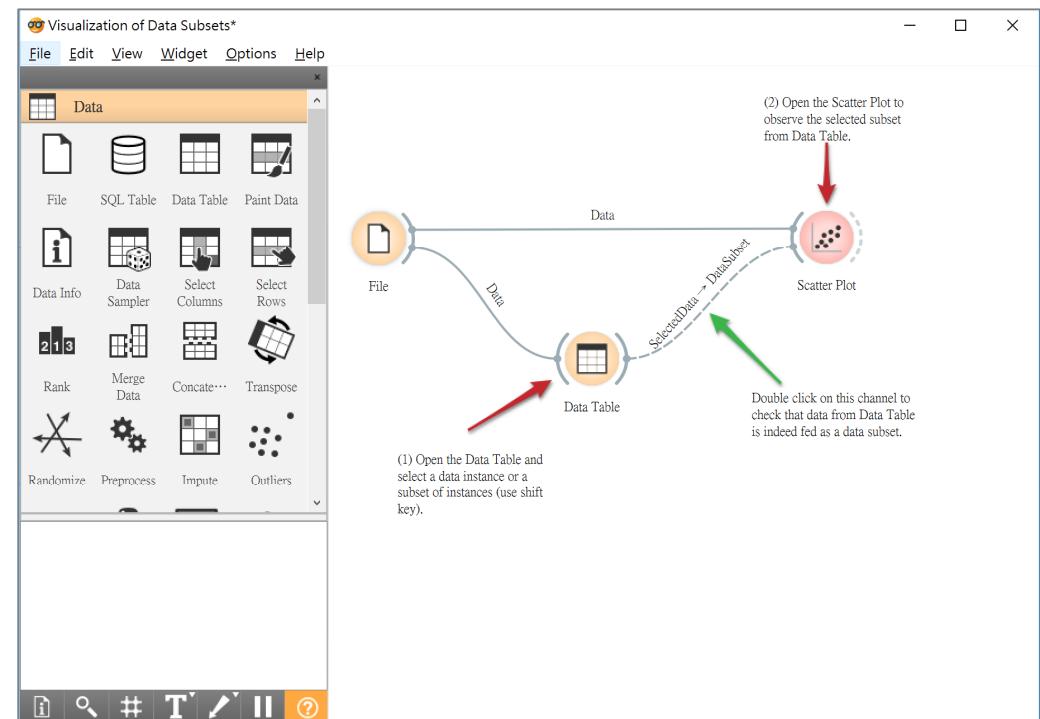
glueviz 視覺化



2.5 Orange 視覺化程式設計(不用寫程式)

Orange

- 安裝 Orange: `conda install -c conda-forge orange3`
- 使用命令提示列 開啟 Orange
 - `python -m Orange.canvas`

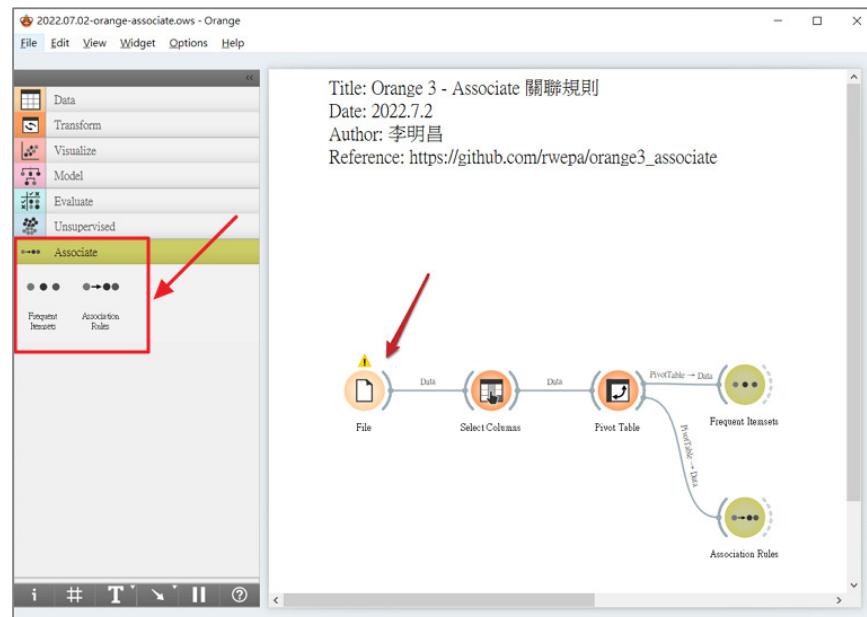


Orange - Scatter Plot



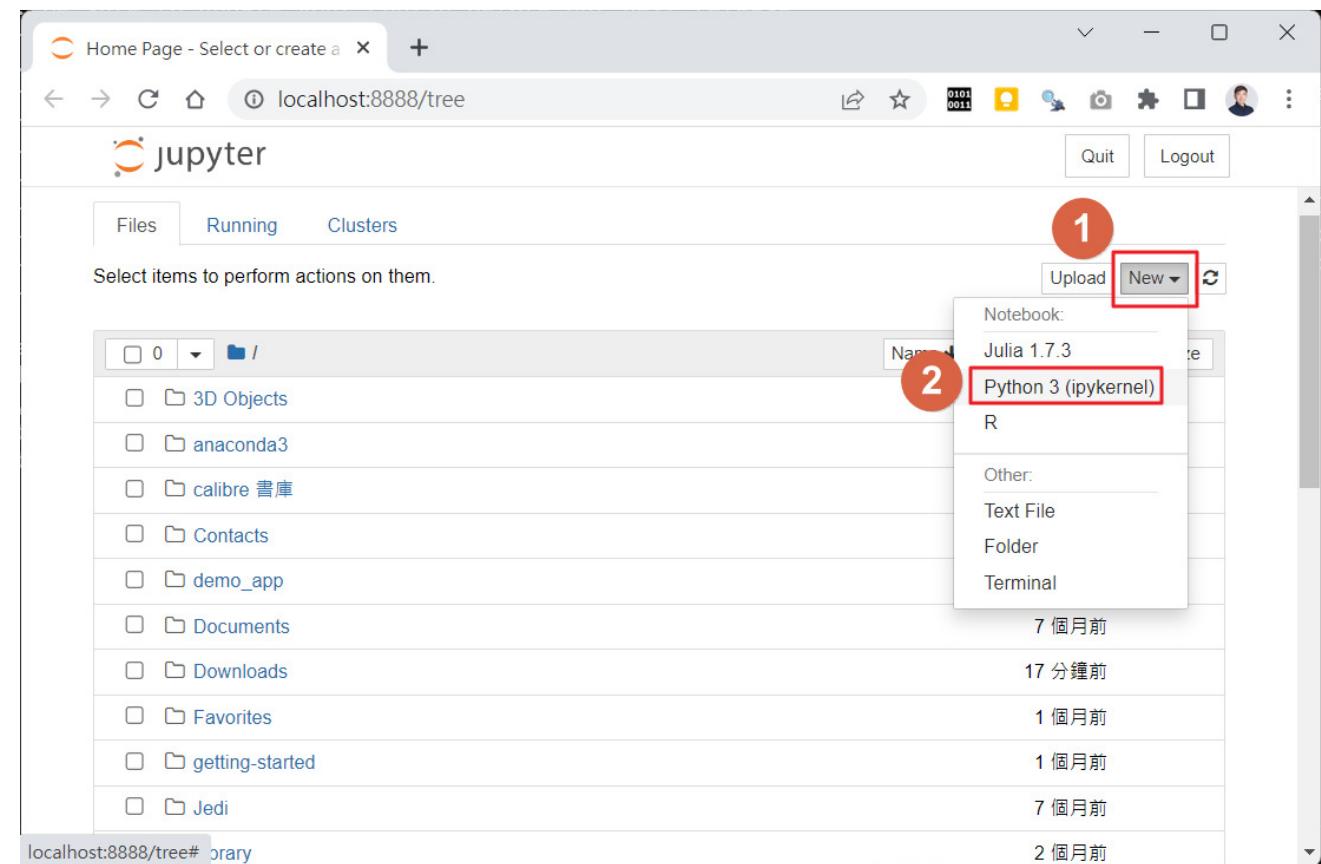
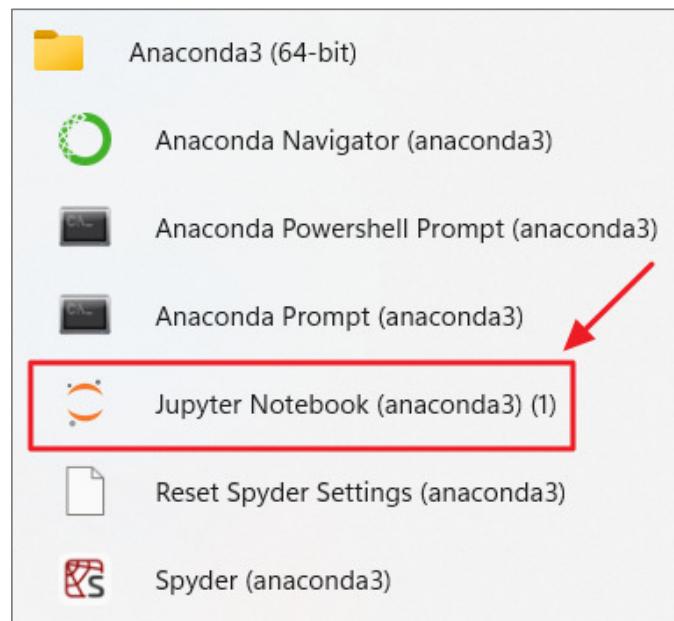
Orange

- 提供視覺化程式設計工具, 包括機器學習, 視覺化等工具.
- <http://rwepa.blogspot.com/2022/07/python-orange-associate-tutorial.html>
- YouTube: <https://youtu.be/rh5GxJamtNg>



2.6 Jupyter notebook 互動式程式設計平台

jupyter notebook





jupyter notebook (續)

實作練習

The screenshot shows the Jupyter Notebook interface with three numbered callouts:

1. 輸入程式 (Input Program): In [2]: `from numpy import *`
2. 執行 (Run): In [3]: `random.rand(5,5)`
3. 重新命名 (Rename): The title bar says "Untitled (unsaved changes)" with a red box around it.

The output of the code execution is displayed in Out[3]:

```
Out[3]: array([[ 0.99403652,  0.17109276,  0.84190235,  0.04537563,  0.88868306],
   [ 0.03845965,  0.8625648 ,  0.90504382,  0.71424797,  0.24861374],
   [ 0.48872416,  0.69003161,  0.51221897,  0.38049437,  0.89148428],
   [ 0.81011968,  0.30820779,  0.653859 ,  0.8477063 ,  0.46920767],
   [ 0.48964363,  0.713421 ,  0.65601074,  0.19109199,  0.22990496]])
```

jupyter notebook – 更改預設目錄

- 關閉所有視窗
- 程式集\ Anaconda3(64-bit) \ Anaconda Prompt (anaconda3)
- cd c:\
- jupyter-notebook



```
Anaconda Prompt (anaconda3) + - X
(base) C:\Users\asus>cd c:\

(base) c:\>jupyter-notebook
[I 2023-01-27 15:41:35.629 LabApp] JupyterLab extension loaded from C:\Users\asus\anaconda3\lib\site-packages\jupyterlab
[I 2023-01-27 15:41:35.629 LabApp] JupyterLab application directory is C:\Users\asus\anaconda3\share\jupyter\la
```

Jupyter Notebook 快速鍵

- 按 [Esc] cell旁邊為藍色：
 - 按 x : 刪除當前選擇的cell
 - 按 a : 在當前選擇的上方新增一個cell
 - 按 b : 在當前選擇的下方新增一個cell
 - 按 Shift + Enter : 執行當前的cell並且選到下一個cell
 - 按 Ctrl + Enter : 執行當前cell
 - 按 M : 轉成markerdown模式，可以看到紅色框框內容從code變成markerdown



開啟 → Python 程式設計-李明昌.ipynb, 瀏覽加入數學式主題

- <http://rwepa.blogspot.com/2020/02/pythonprogramminglee.html>

實作練習

主題: Python 程式設計-李明昌 - ipynb

檔名: Python_Programming_Lee_ipynb.zip

包括 Python 程式設計-李明昌電子書的原始 ipynb 檔案, 圖檔, 部分資料集

下載: https://github.com/rwepa/DataDemo/blob/master/Python_Programming_Lee_ipynb.zip



Python_Programming_Lee_ipynb.zip > python.book.lee >	
名稱	類型
.ipynb_checkpoints	檔案資料夾
data	檔案資料夾
img	檔案資料夾
Python 程式設計-李明昌.ipynb	IPYNB 檔案



Jupyter Notebook-匯入圖片

- https://github.com/rwepa/DataDemo/blob/master/Python_Programming_Lee.pdf, pdf: p.18
- https://github.com/rwepa/teaching-programming/blob/main/02_jupyter_insert_image.ipynb
- https://github.com/rwepa/teaching-programming/blob/main/02_jupyter_insert_image.pdf

實作練習

jupyter_notebook_insert image

學號: 2023007168

姓名: 李明昌

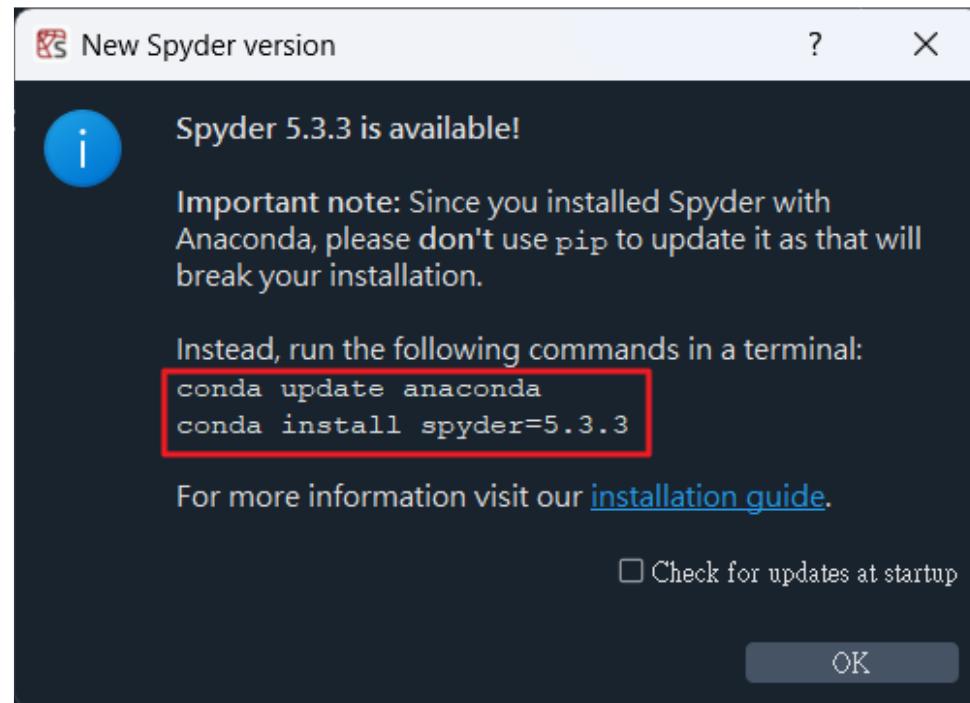
In [1]:

```
# 下載圖片 https://github.com/rwepa/teaching-programming/blob/main/images/Konigssee.png
# 將下載之 png 置於 Jupyter Notebook 論文之目錄\images 資料夾, 例: 使用查詢結果 C:\Users\User\images\konigssee.png
方法1 
```



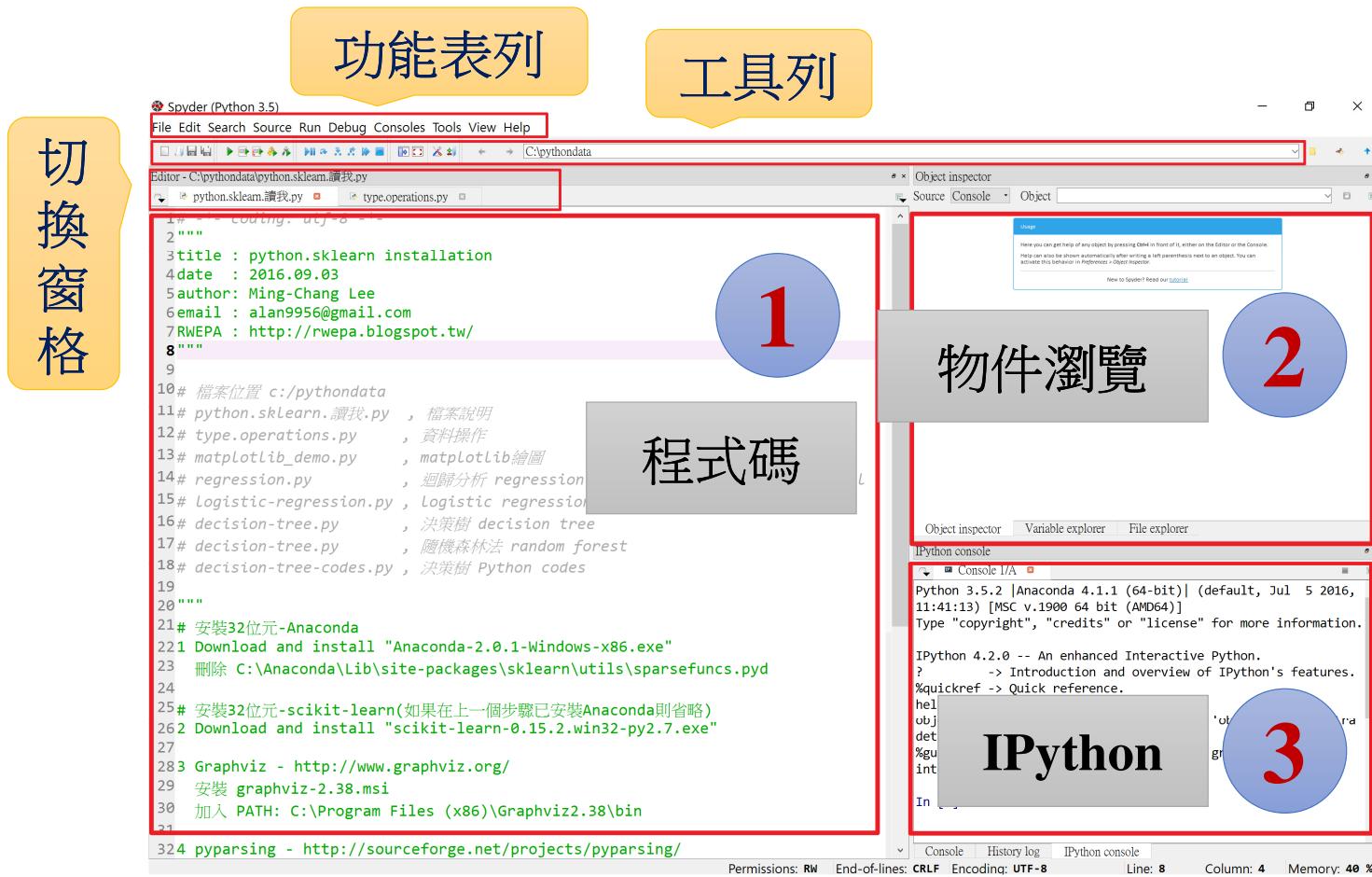
2.7 Spyder 整合式開發環境

Spyder 更新



- Anaconda 整體更新 `conda update anaconda`
- Spyder 更新 `conda install spyder=5.3.3`

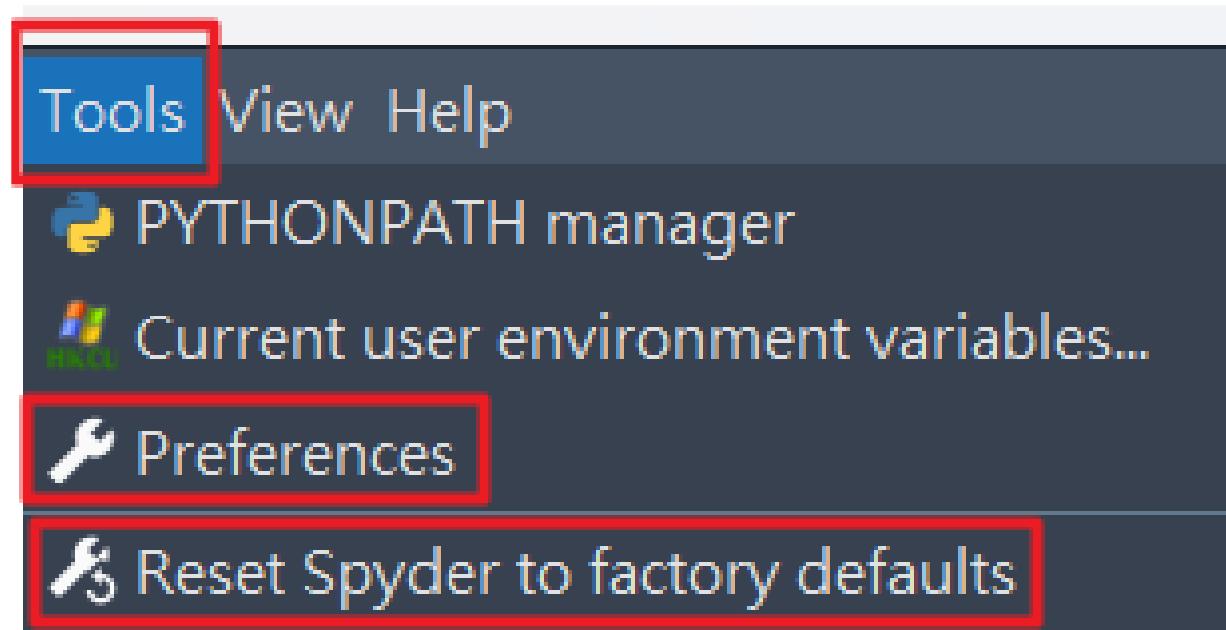
Spyder 畫面



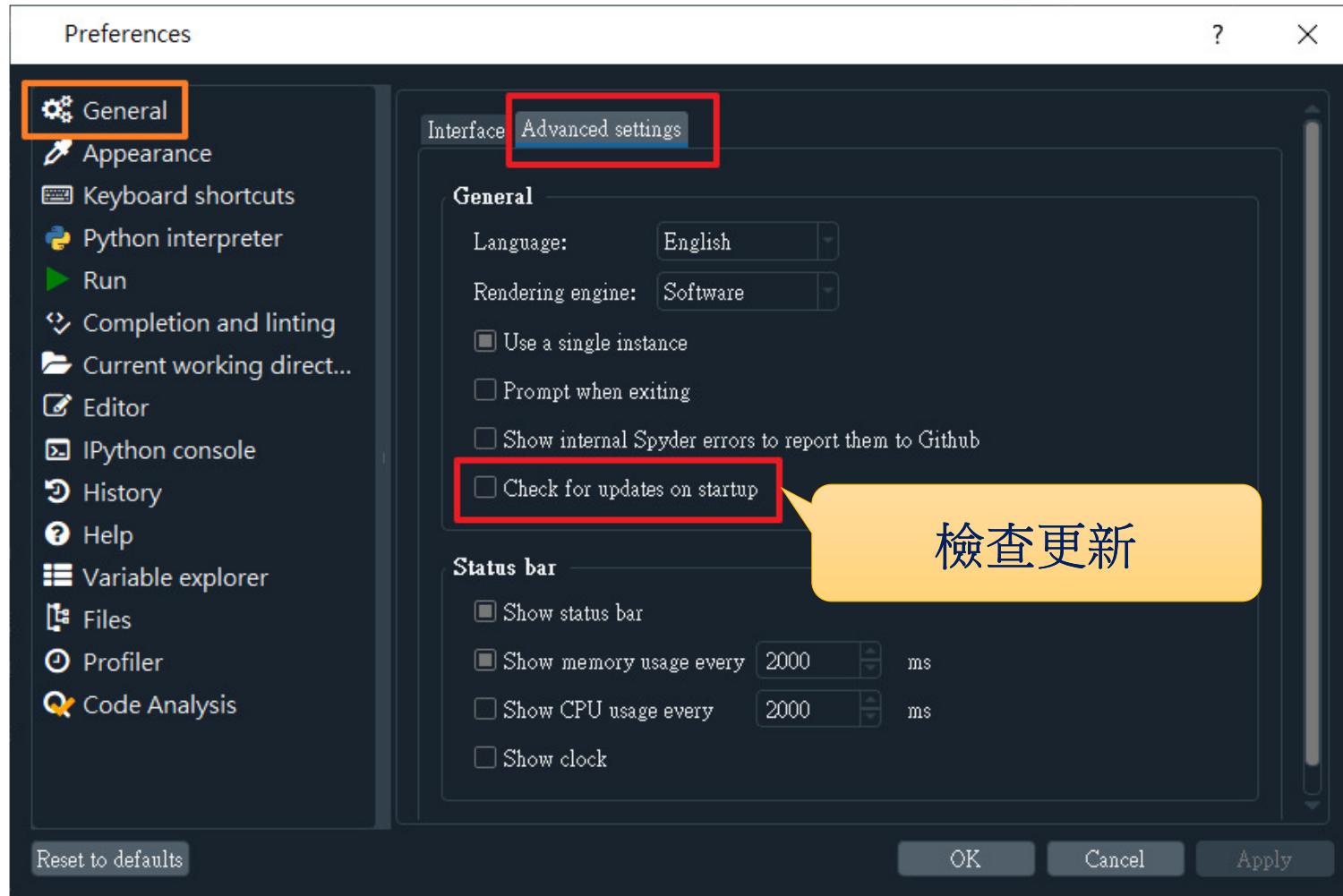
喜好設定 Tools\Preferences

Tools \ Preferences

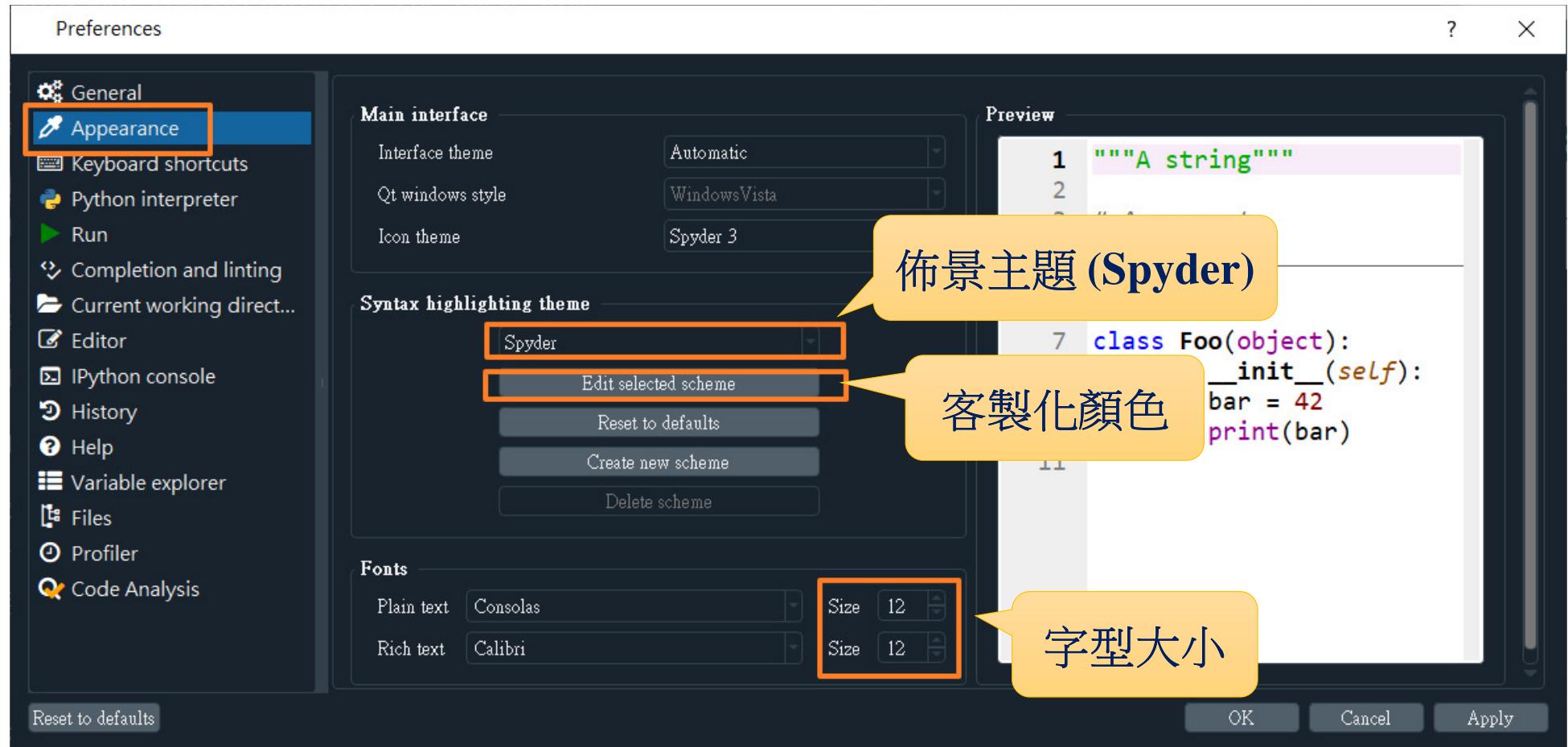
- Preferences: 工具設定
- Reset Spyder to factory defaults 恢復 Spyder 為預設值



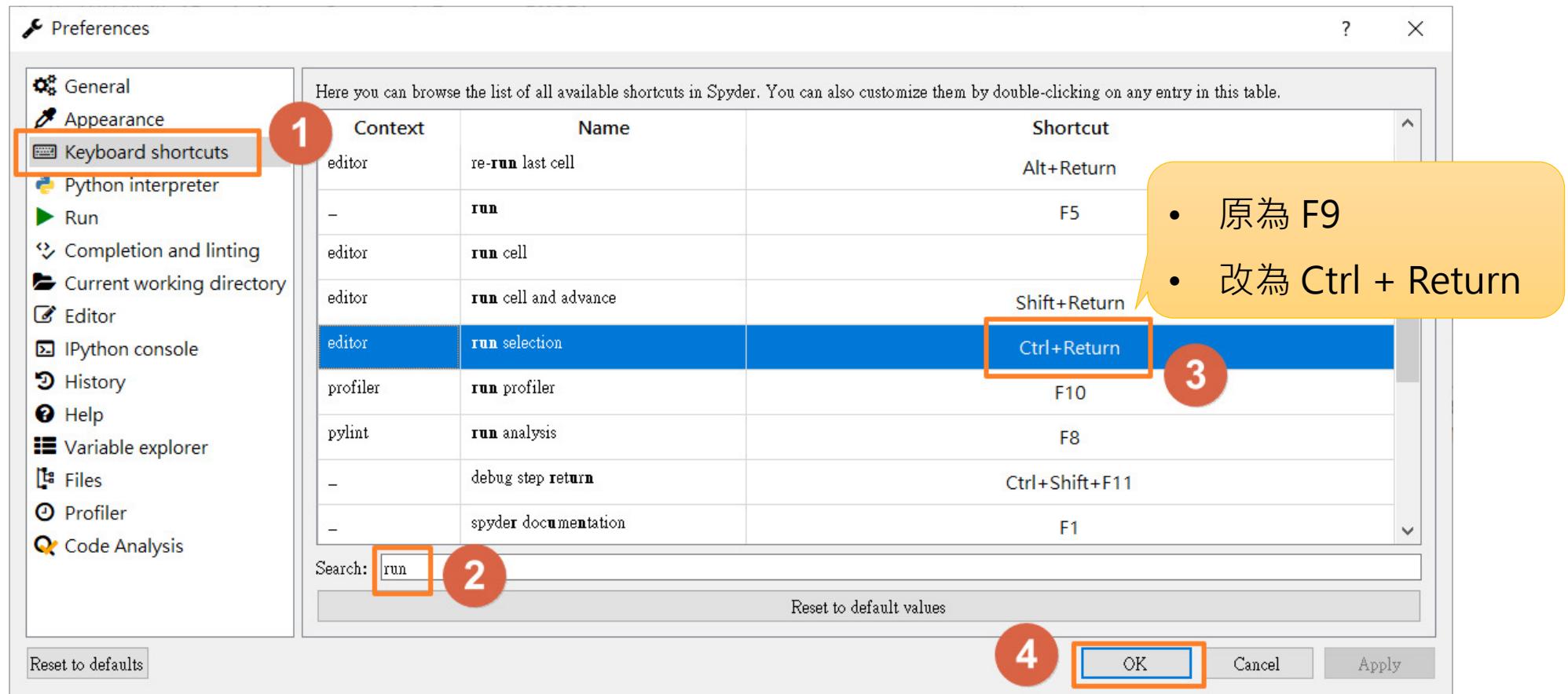
Preferences – General – Advanced setting



Preferences – Appearance



Preferences – Keyboard shortcuts



Spyder 好用的快速鍵

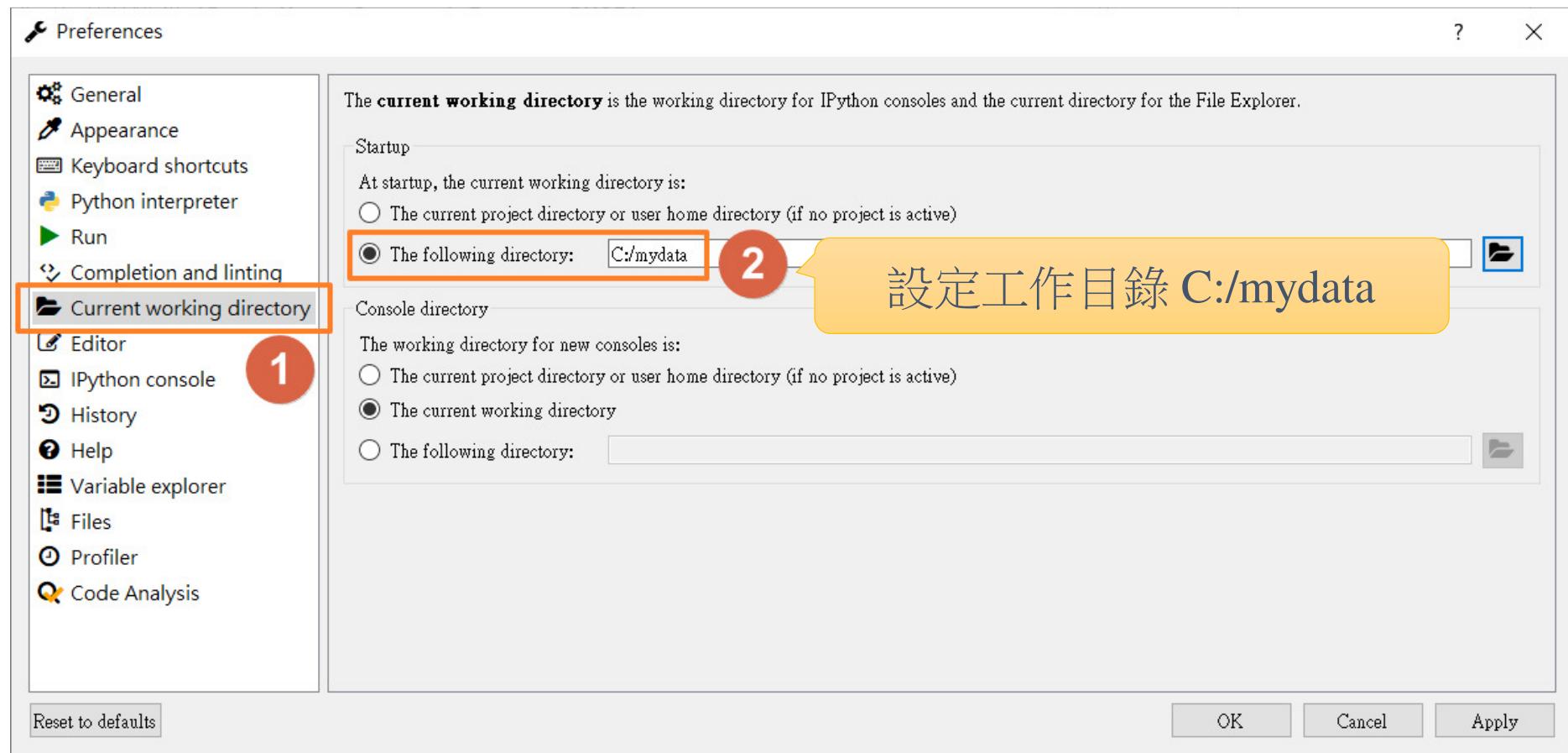
- 執行選取程式碼 **Ctrl + Enter (原為 F9)**
- 註解切換 **Ctrl + 1**
- 尋找 **Ctrl + F**
- 取代 **Ctrl + R**
- 切換至編輯視窗 **Ctrl + Shift + E**
- 切換至 Ipython Console **Ctrl + Shift + I**
- 檔案切換 **Ctrl + P**
- **重新啟動 Ipython Console** **Ctrl + .**
- 檢視放大 **Ctrl + “+”**
- 檢視縮小 **Ctrl + “-”**
- 重新啟動 Spyder **Alt + Shift + R**

Ipython Console 視窗

- 清空: **Ctrl + L**
- 清空: **%clear**

☰	Split vertically (上下垂直分割)	Ctrl+{
☱	Split horizontally (左右水平分割)	Ctrl+_
✖	Close this panel	Alt+Shift+W

Preferences – Current working directory





Preferences – Editor – Wrap lines

實作練習3

The screenshot shows the Python Preferences dialog with the 'Editor' category selected. In the 'Display' tab, the 'Wrap lines' checkbox is checked and highlighted with an orange border. A yellow callout bubble with the text '自動換列' (Automatic Line Wrapping) points to this checkbox. The 'OK' button at the bottom is also highlighted with an orange border.

Preferences

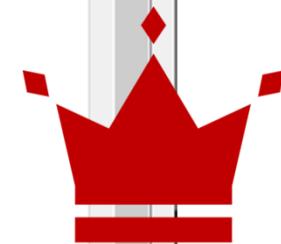
General Appearance Keyboard shortcuts Python interpreter Run Completion and linting Current working directory Editor IPython console History Help Variable explorer Files Profiler Code Analysis

Display Source code Run code Advanced settings

Show tab bar
Show selector for classes and functions
Show indent guides
Show code folding
Show line numbers
Show blank spaces
Highlight current line
Highlight current cell
Wrap lines
Scroll past the end
Highlight occurrences after 1500 ms

Reset to defaults OK Cancel Apply

恭喜您，開啟人生
Python 學習之旅 ^_^



Python 執行-命令提示列

- 建立 C:\mydata\helloworld.py

A screenshot of a code editor window titled "helloworld.py". The code content is as follows:

```
1 # -*- coding: utf-8 -*-
2 """
3 Created on Tue Jun 22 23:06:49 2021
4
5 @author: rwepa
6 """
7
8 print("大數據Python應用")
```

A screenshot of a command prompt window titled "命令提示字元". The command history shows:

```
C:\mydata>python --version
Python 3.8.8

C:\mydata>dir
磁碟區 C 中的磁碟是 WIN10
磁碟區序號: E428-7C96

C:\mydata 的目錄

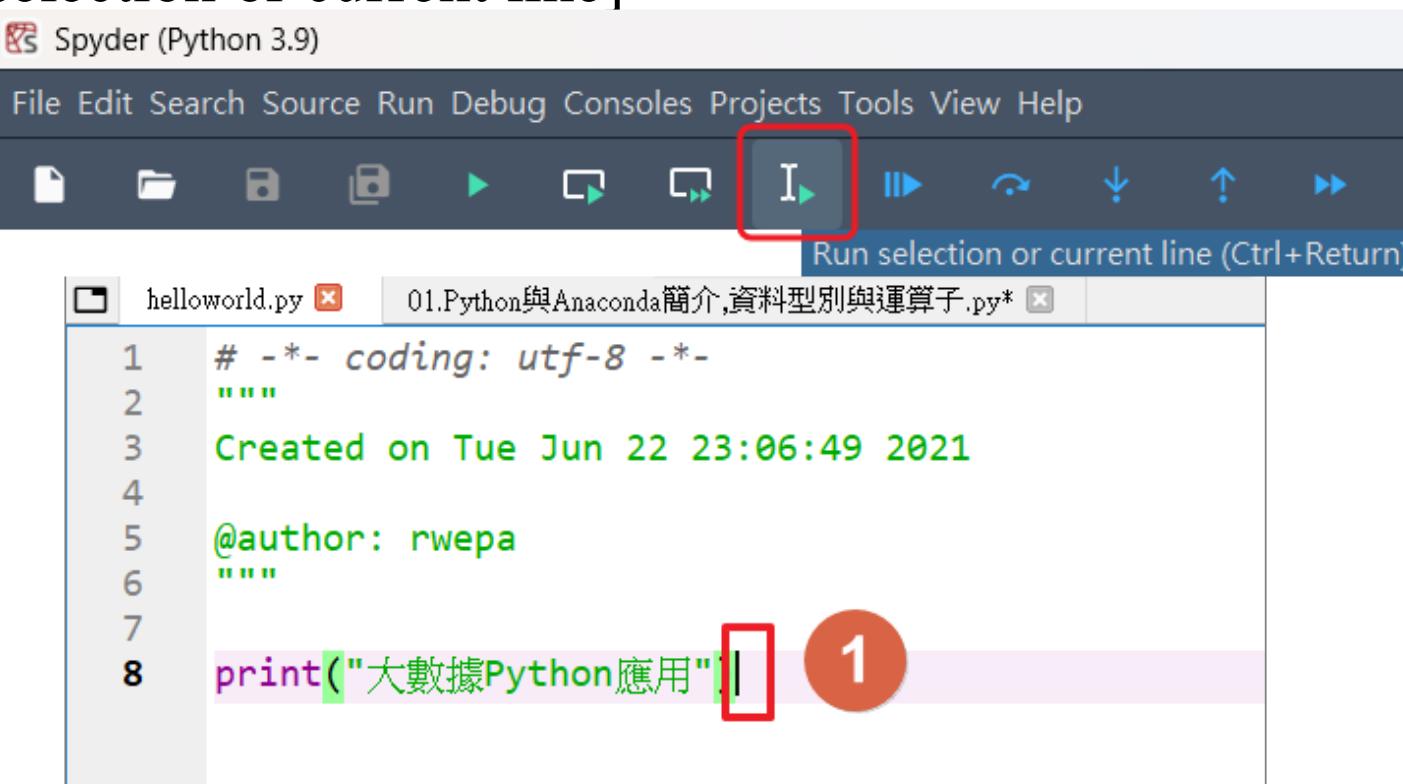
2021/06/22 下午 11:10    <DIR> .
2021/06/22 下午 11:10    <DIR> ..
2021/06/22 下午 11:08            122 helloworld.py
                                1 個檔案          122 位元組
                                2 個目錄   62,354,751,488 位元組可用

C:\mydata>python helloworld.py
大數據Python應用

C:\mydata>
```

Python 執行-使用 Spyder

- 選取資料列
- 按 [Run selection or current line]



2.8 conda虛擬環境

Anaconda 模組管理

- 程式集 \Anaconda3 (64-bit) \
- 顯示已安裝模組
- conda list



```
(base) C:\Users\asus>conda list
# packages in environment at C:\Users\asus\anaconda3:
#
# Name           Version      Build  Channel
_ipyw_jlab_nb_ext_conf    0.1.0      py39haa95532_0
alabaster          0.7.12      pyhd3eb1b0_0
altair             4.2.0      pyhd8ed1ab_1    conda-forge
anaconda          2022.10      py310_0
anaconda-client     1.11.0      py39haa95532_0
anaconda-navigator   2.3.1      py39haa95532_0
```

Anaconda 模組管理(續)

- 尋找官網套件
`conda search matplotlib`
- 安裝模組
`conda install 模組名稱`
- 更新模組
`conda update 模組名稱`

conda 虛擬環境

- # 檢視所有虛擬環境清單
- `conda env list`
- # 啟用 myenv 虛擬環境
- `conda activate myenv`
- # 關閉虛擬環境
- `conda deactivate`

conda 建立虛擬環境

- # 建立 myenv 虛擬環境
- # --name 也可以使用 -n
- # --file 也可以使用 -f
- **conda create --name myenv**
- # 建立特定 python 版本的虛擬環境
- **conda create -n myenv python=3.11**
- # 建立特定 scipy 模組版本的虛擬環境
- **conda create -n myenv scipy=1.9.0**
- # 建立特定 python 版本與特定 scipy 模組版本的虛擬環境
- **conda create -n myenv python=3.9 scipy=1.9.0**

謝謝您的聆聽

Q & A



李明昌

alan9956@gmail.com

<http://rwepa.blogspot.tw/>