

程式設計

1082數位教材

單元2: Python簡介

主講老師：徐培倫

- ◆ Python介紹
- ◆ Python歷史
- ◆ Python安裝
- ◆ Anaconda 安裝
- ◆ 第一個 Python 程式

Python 介紹 (維基)

- ◆ Python 誕生於1991年，算是一門古老的語言；而且是一種功能強大的直譯式的程式語言。
 - 少了編譯連結的步驟
 - 省略變數類型宣告動作
 - 自動化的記憶體管理：garbage collection 與 JAVA相同
 - 嚴格的排版 (四個空格)
 - 支援物件導向程式設計，如類別、多型、繼承等設計

Python 歷史

- Python 的創始人為吉多·范羅蘇姆 (Guido van Rossum)
- 1989 年的聖誕節期間，吉多·范羅蘇姆為了在阿姆斯特丹打發時間，決心開發一個新的腳本解釋程式，作為 ABC 語言的一種繼承



- Python 2.0 於 2000 年 10 月 16 日發布，增加了實現完整的垃圾回收，並且支援 Unicode
- Python 3.0 於 2008 年 12 月 3 日發布，此版不完全相容之前的 Python 原始碼，不過很多新特性後來也被移植到舊的 Python 2.6/2.7 版本
- Python 是完全物件導向的語言
- 函式、模組、數字、字串都是物件

Python 常見規則

- ◆ **註解**: 請參考 Anaconda 的 Spyder 3 預設檔案
 - #: 單行註解
 - “ “ “: 多行註解 (三個雙引號)
- ◆ 用縮排取代大括號 {}, 程式區塊是利用縮排分隔
- ◆ 常見的縮排為四個空白鍵, 也可以使用 Tab 鍵, 直譯器會自動轉換
- ◆ 語法結束時直接換行, 不以分號 (;) 當成語法的結束

Python2.x 與 Python3.x 選擇

- ◆ 在2008年12月，推出的 Python 3.0 中，新增了許多功能
- ◆ Python 3.x 不相容 Python 2.x
- ◆ 本教材的編寫大部分都是用 Python3.x，所以之後的介紹皆以Python 3為主。

Python 安裝

- ◆ 進入Python官方網站 <https://www.python.org/>
- ◆ 選擇 Downloads 下載 Python 3.8.3

The screenshot shows the Python.org website interface. At the top, there is a navigation bar with links for Python, PSF, Docs, PyPI, Jobs, and Community. Below this is the Python logo and a search bar with a 'GO' button and a 'Socialize' link. A secondary navigation bar contains links for About, Downloads, Documentation, Community, Success Stories, News, and Events. The 'Downloads' link is highlighted, and a dropdown menu is visible with options: All releases, Source code, Windows, Mac OS X, Other Platforms, License, and Alternative Implementations. The 'Windows' option is selected, leading to a 'Download for Windows' section. This section features a 'Python 3.8.3' button, a note stating 'Note that Python 3.5+ cannot be used on Windows XP or earlier.', and a paragraph: 'Not the OS you are looking for? Python can be used on many operating systems and environments. View the full list of downloads.'

Tutorial 教學

- ◆ Python官方網站提供了許多文件資源，對於初學者可以至下列網站查看。

<https://docs.python.org/3/tutorial/index.html>

The screenshot shows the Python documentation website interface. At the top, there is a navigation bar with the Python logo, a language dropdown menu set to '英語', a version dropdown menu set to '3.7.0', and a '文檔' link. To the right is a search box labeled 'Quick search' with a '走' button. Below the navigation bar, the main content area is titled 'Python教程'. The text describes Python as a language that is easy to learn, powerful, and efficient, suitable for various platforms and domains. It also mentions that Python interpreters and standard libraries are available for free from the Python website (<https://www.python.org/>).

Python官方網站提供了許多文件資源，對於初學者可以至下列網站查看。

<https://docs.python.org/3/tutorial/index.html>

Python教程

Python是一種易於學習，功能強大的編程語言。它具有高效的高級數據結構和麵向對象編程的簡單而有效的方法。Python優雅的語法和動態類型及其解釋性使其成為大多數平台上許多領域的腳本編寫和快速應用程序開發的理想語言。

Python解釋器和廣泛的標準庫可以從Python網站<https://www.python.org/>的所有主要平台以源代碼或二進制形式免費獲得，並且可以免費分發。同一站點還包含許多免費的第三方Python模塊，程序和工具以及其他文檔的分發和指針。

Anaconda 開發環境

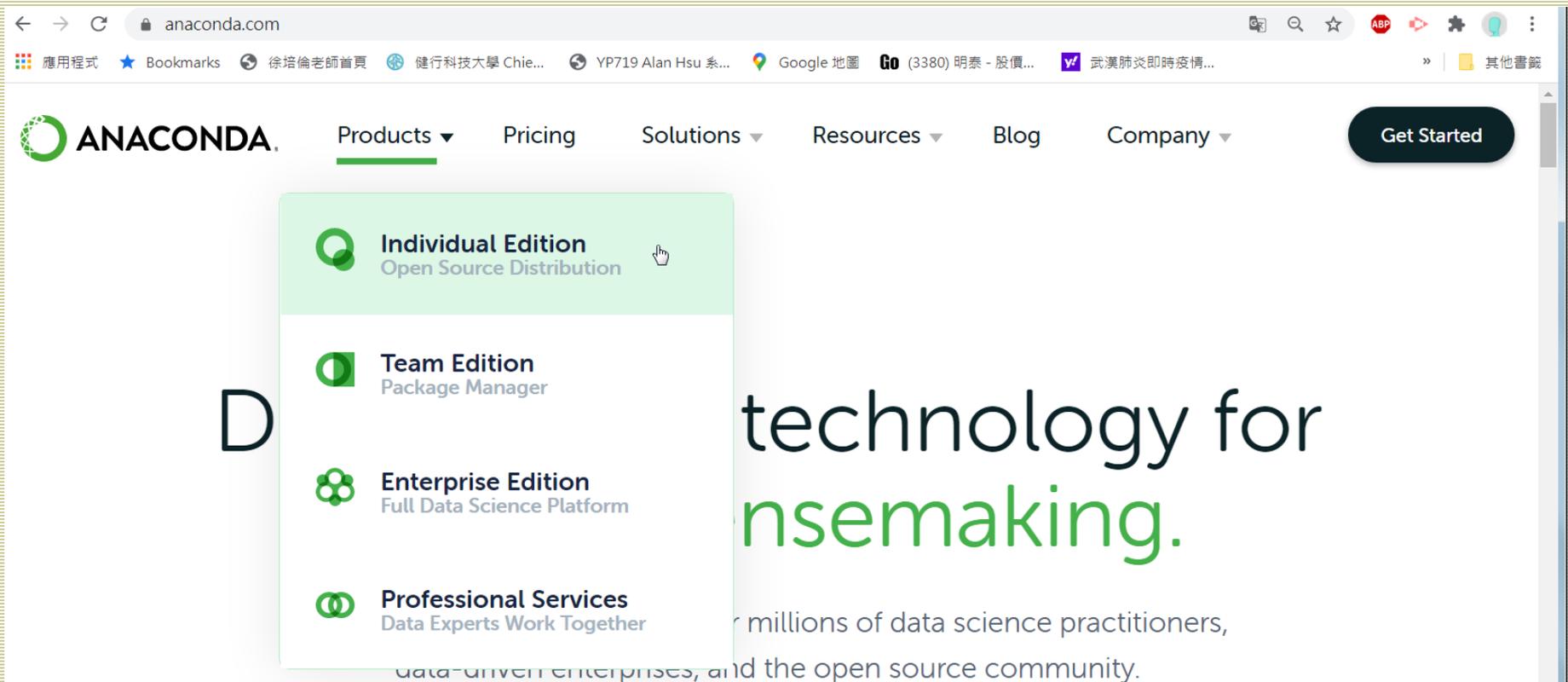
- ◆ 是一種Python語言的免費增值開源發行版，用於進行大規模數據處理、預測分析，和科學計算，致力於簡化包的管理和部署
 - Python(shell)：標準Cpython,是用C語言實作的Python直譯器
 - IPython(shell)：是一種基於Python的交互式解釋器。提供了更為強大的編輯和交互功能。

Anaconda 開發環境

- ◆ Jupyter Notebook：即可在瀏覽器中開啟編輯器。由網址列「localhost:8888/」可知是系統在本機建立一個網頁伺服器
- ◆ Spyder：直接點擊打開IDE。最大優點就是模仿MATLAB的「工作空間」
- ◆ Anaconda Prompt：命令行終端

Anaconda 安裝

- ◆ 官網 <https://www.anaconda.com/>
- ◆ 選擇 Products / Individual Edition



The screenshot shows the Anaconda website's navigation menu. The 'Products' dropdown is open, highlighting 'Individual Edition' (Open Source Distribution). Other options include 'Team Edition' (Package Manager), 'Enterprise Edition' (Full Data Science Platform), and 'Professional Services' (Data Experts Work Together). The background features the Anaconda logo and the text 'technology for nsemaking.' and 'r millions of data science practitioners, and the open source community.'

ANAACONDA. Products ▾ Pricing Solutions ▾ Resources ▾ Blog Company ▾ Get Started

Individual Edition
Open Source Distribution

Team Edition
Package Manager

Enterprise Edition
Full Data Science Platform

Professional Services
Data Experts Work Together

technology for
nsemaking.

r millions of data science practitioners,
and the open source community.

Anaconda 下載

◆ Your data science toolkit 的 Download

Anaconda Installers

Windows

Python 3.7

[64-Bit Graphical Installer \(466 MB\)](#)

[32-Bit Graphical Installer \(423 MB\)](#)

Python 2.7

[64-Bit Graphical Installer \(413 MB\)](#)

[32-Bit Graphical Installer \(356 MB\)](#)

MacOS

Python 3.7

[64-Bit Graphical Installer \(442 MB\)](#)

[64-Bit Command Line Installer \(430 MB\)](#)

Python 2.7

[64-Bit Graphical Installer \(637 MB\)](#)

[64-Bit Command Line Installer \(409 MB\)](#)

Linux

Python 3.7

[64-Bit \(x86\) Installer \(522 MB\)](#)

[64-Bit \(Power8 and Power9\) Installer \(276 MB\)](#)

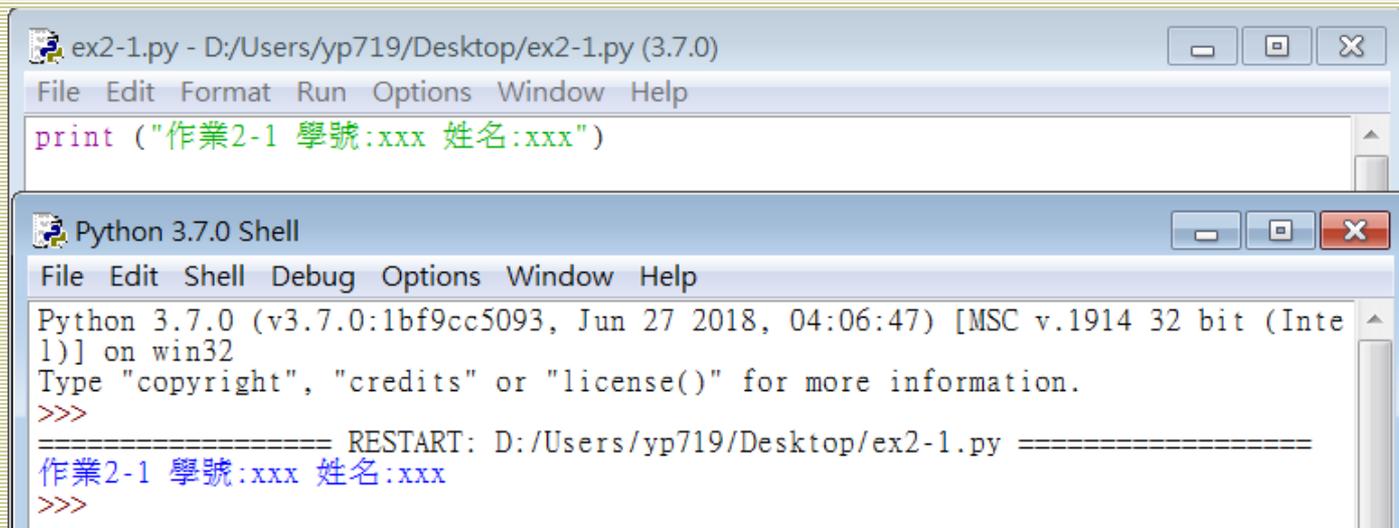
Python 2.7

[64-Bit \(x86\) Installer \(477 MB\)](#)

[64-Bit \(Power8 and Power9\) Installer \(295 MB\)](#)

第一個 Python 程式

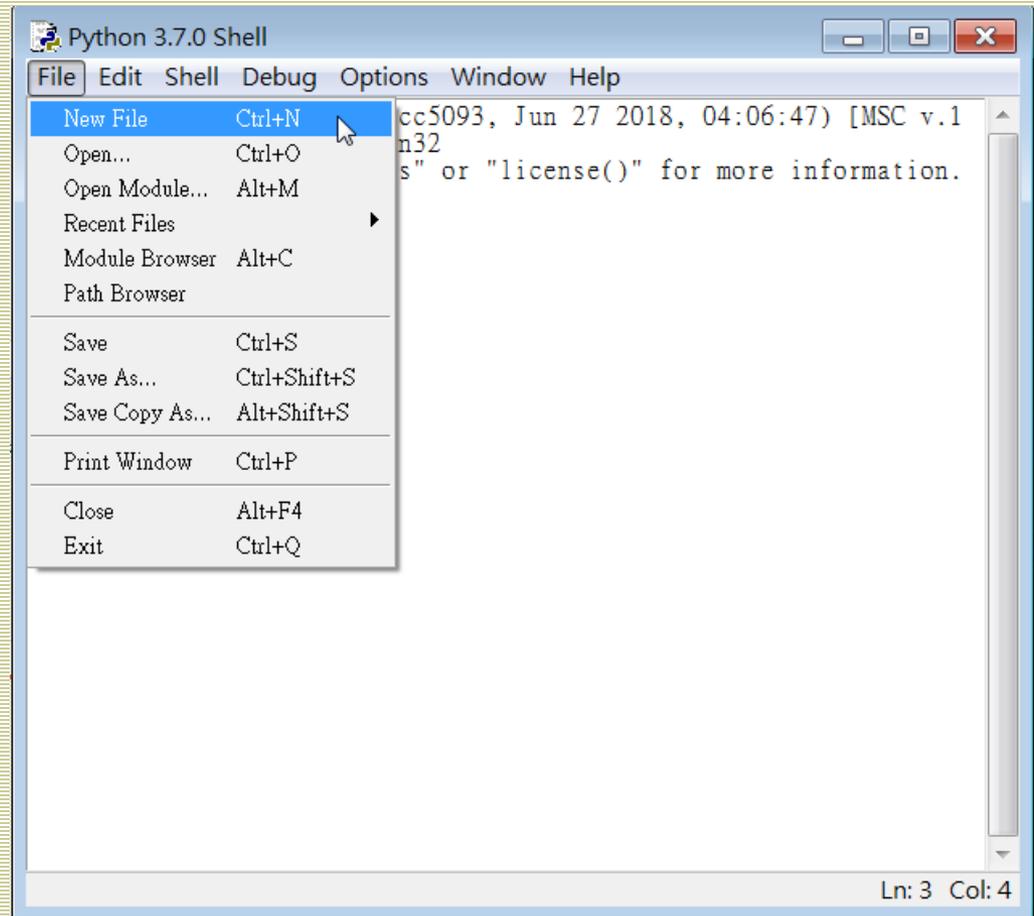
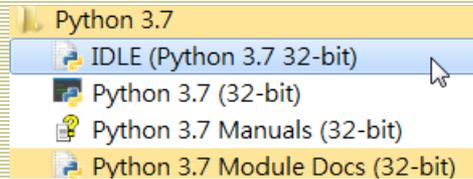
- ◆ Hello World! - 作業2-1 學號:xxx 姓名:xxx
- ◆ Python 原始程式 只要一行 print 印出
 - print (“作業2-1 學號:xxx 姓名:xxx”)
- ◆ Python 3.7 使用 IDLE 整合環境結果



The screenshot shows two windows from the Python 3.7 IDLE environment. The top window, titled 'ex2-1.py - D:/Users/yp719/Desktop/ex2-1.py (3.7.0)', contains a single line of Python code: `print ("作業2-1 學號:xxx 姓名:xxx")`. The bottom window, titled 'Python 3.7.0 Shell', shows the execution output. It starts with the Python version and platform information: 'Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32'. It then shows the prompt 'Type "copyright", "credits" or "license()" for more information.' followed by '>>>>'. Below this, it shows the output of the script: '===== RESTART: D:/Users/yp719/Desktop/ex2-1.py =====' followed by '作業2-1 學號:xxx 姓名:xxx' and another '>>>>' prompt.

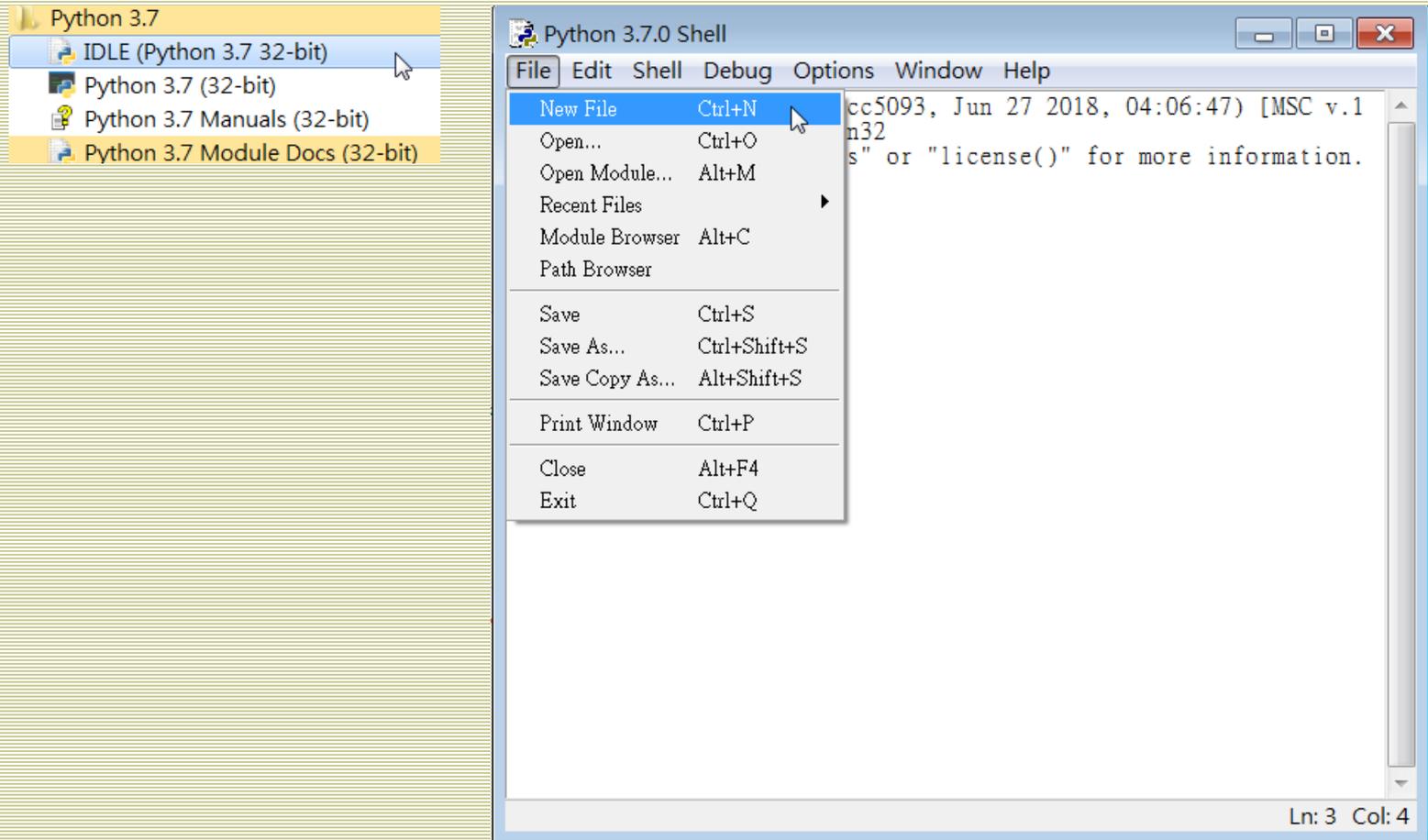
Python IDLE

◆ 執行開始 / Python 3.7 / IDLE



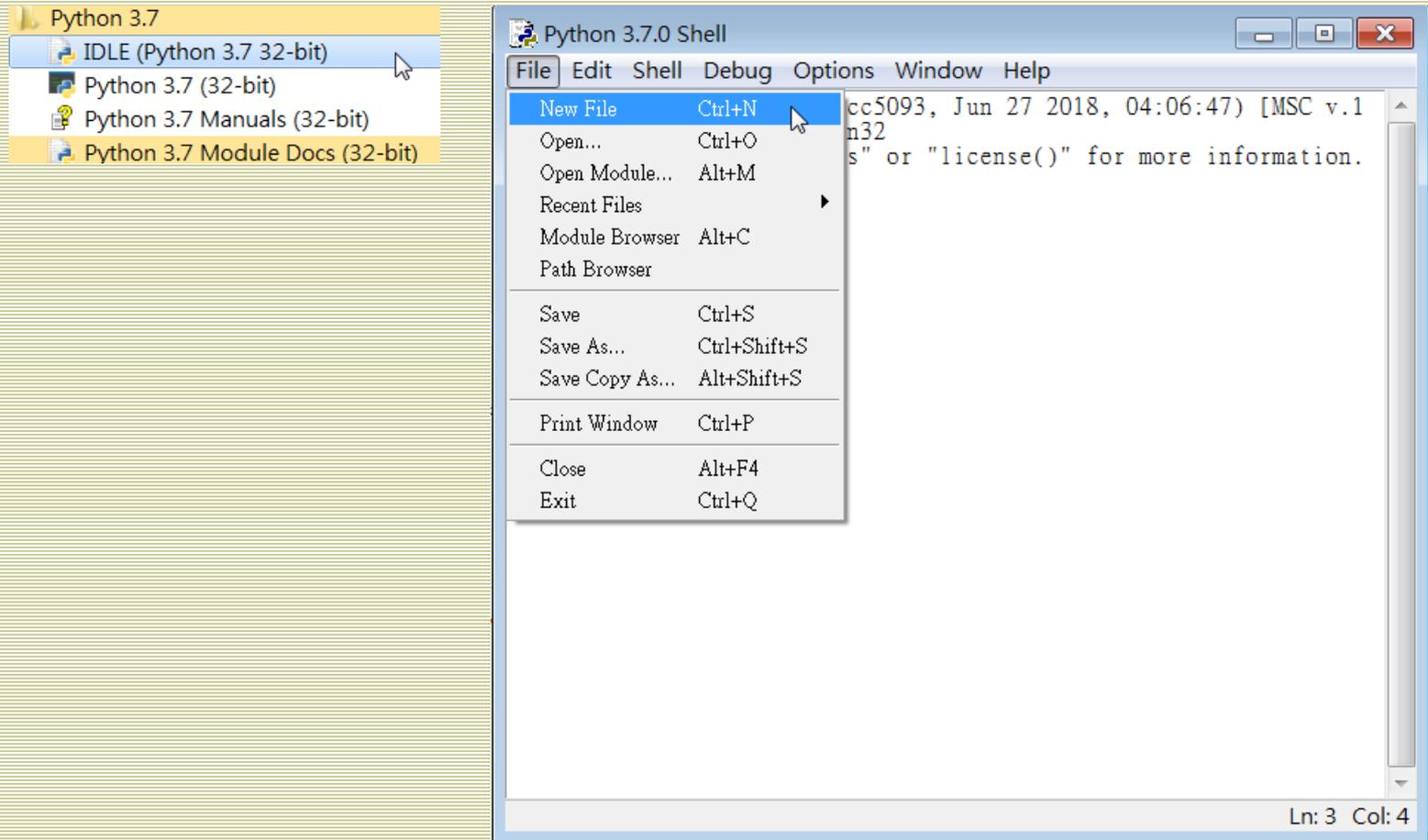
Python IDLE

- ◆ File / New File 鍵入 print ('Hello')



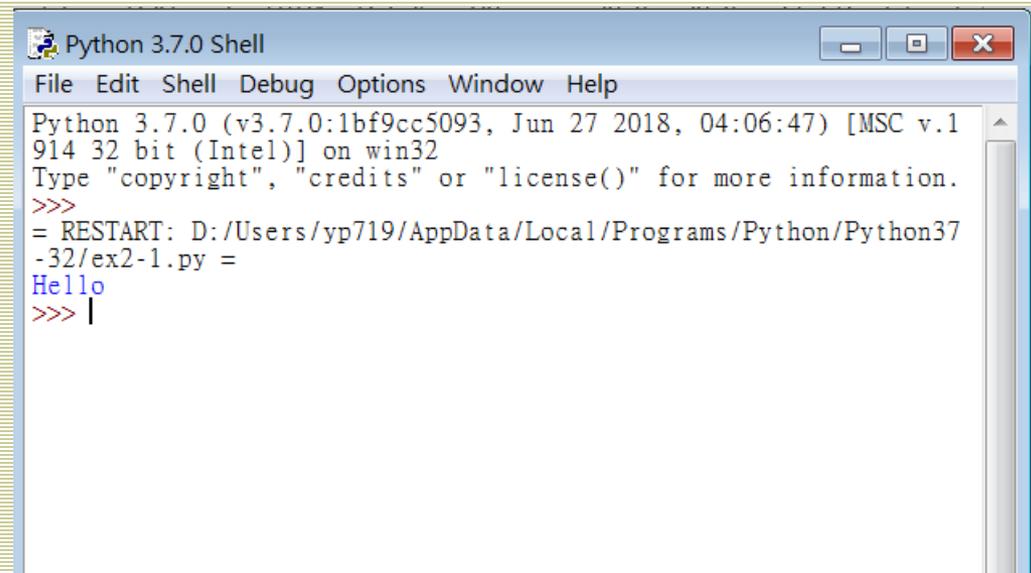
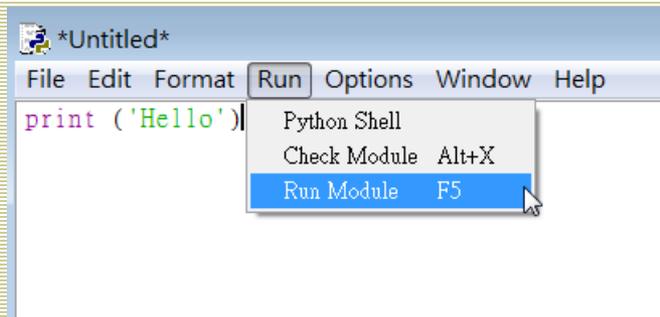
Python IDLE

- ◆ File / New File 鍵入 print ('Hello')



Python IDLE

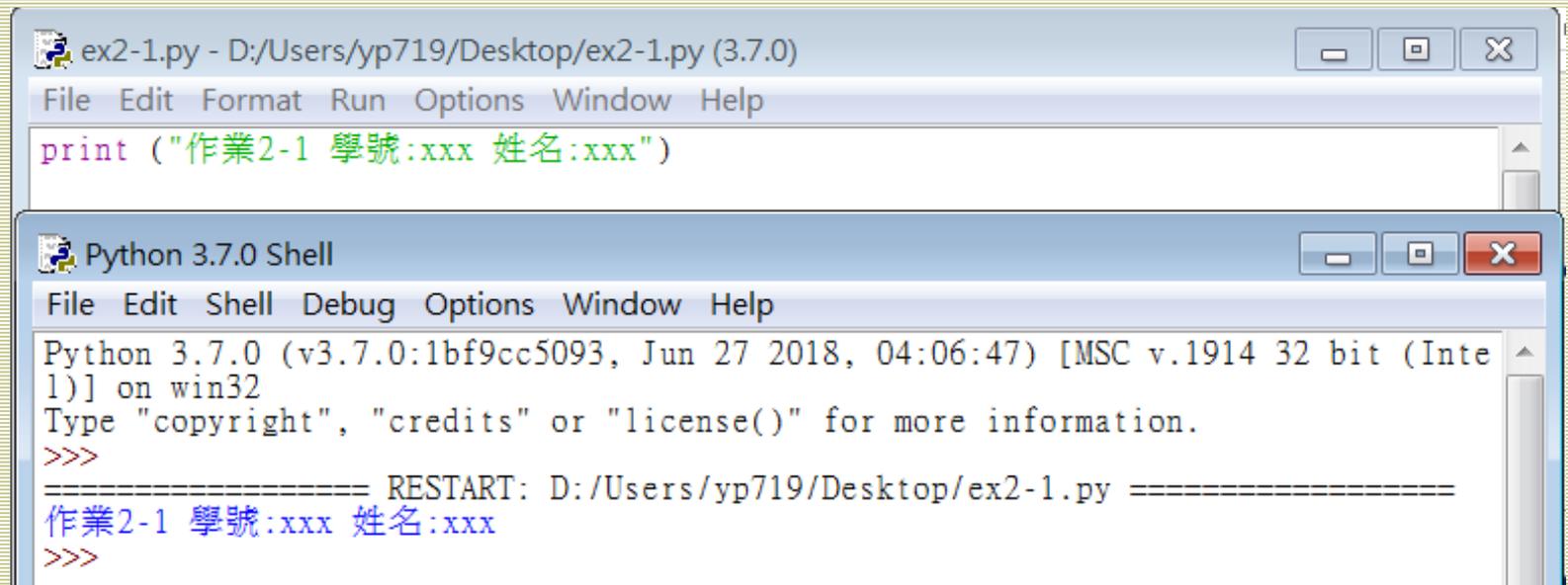
- ◆ Run/ Run Module F5 輸入檔名(ex2-1) / 顯示結果(Python 3.7.0 Shell)



作業2-1 製作過程

- ◆ 使用 IDLE / 開啟新檔(File/New) / Run Module F5 / 檔名 ex2-1.py
- ◆ 顯示執行結果
- ◆ 附屬應用程式 / 剪取工具 (請將訂選在工作列上)
- ◆ 再剪取工具下複製
- ◆ 交作業的標題列上 / 滑鼠右鍵貼上
- ◆ 將 image.png 按 + 顯示在畫面上

作業2-1 結果



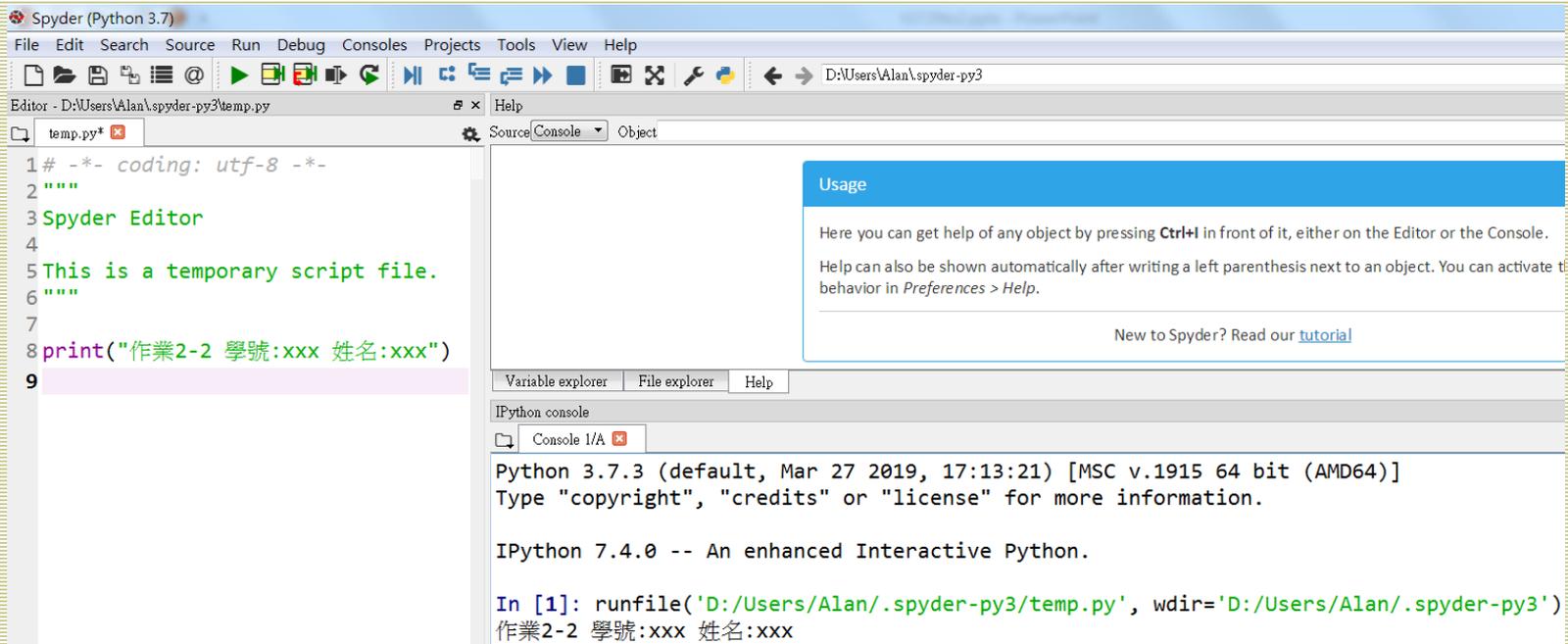
The image shows two overlapping windows from a Python IDE. The top window, titled 'ex2-1.py - D:/Users/yp719/Desktop/ex2-1.py (3.7.0)', contains a single line of Python code: `print ("作業2-1 學號:xxx 姓名:xxx")`. The bottom window, titled 'Python 3.7.0 Shell', shows the execution output. It starts with the Python version and architecture information: 'Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32'. It then prompts the user for more information with 'Type "copyright", "credits" or "license()" for more information.' and shows the prompt '>>>>'. A restart message follows: '=====
===== RESTART: D:/Users/yp719/Desktop/ex2-1.py ====='. The output of the script is displayed in blue text: '作業2-1 學號:xxx 姓名:xxx', followed by another prompt '>>>>'.

```
ex2-1.py - D:/Users/yp719/Desktop/ex2-1.py (3.7.0)
File Edit Format Run Options Window Help
print ("作業2-1 學號:xxx 姓名:xxx")

Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1914 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
=====  
===== RESTART: D:/Users/yp719/Desktop/ex2-1.py =====
作業2-1 學號:xxx 姓名:xxx
>>>
```

作業2-2 使用 Anaconda

- ◆ 使用 Anaconda Spyder 3 編譯器
- ◆ 同理, Spyder 的程式及 IPython 執行結果一併剪下後貼上



The screenshot displays the Spyder Python IDE interface. The top menu bar includes File, Edit, Search, Source, Run, Debug, Consoles, Projects, Tools, View, and Help. The main editor window shows a file named 'temp.py' with the following code:

```
1 # -*- coding: utf-8 -*-
2 """
3 Spyder Editor
4
5 This is a temporary script file.
6 """
7
8 print("作業2-2 學號:xxx 姓名:xxx")
9
```

Below the editor is the IPython console, which shows the output of the code execution:

```
Python 3.7.3 (default, Mar 27 2019, 17:13:21) [MSC v.1915 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 7.4.0 -- An enhanced Interactive Python.

In [1]: runfile('D:/Users/Alan/.spyder-py3/temp.py', wdir='D:/Users/Alan/.spyder-py3')
作業2-2 學號:xxx 姓名:xxx
```