113-1基礎程式設計(1)

亞大資工系

課程大綱

- W1-Python簡介及程式工具
- W2
- W3-變數和運算
- W4-迴圈和格式化輸出
- W5-判斷式和容器
- W6-字串處理和輸出入
- W7-字典容器
- W8-檔案處理
- W9-期中測驗

- W10-函數
- W11-進階流程控制
- W12-進階運算和生成器
- W13-進階函數
- W14-類別
- W15-進階類別
- W16-模組和套件
- W17-進階設計
- W18-M3測驗

課程大綱

- Essential-基本的
  - 啟思博的概念(Kissipo Learning)
    - KISS Principle: Colab + Github的使用
    - Anaconda 和Jupyter notebook
  - Hello World程式
  - IPO model: input–process–output (輸入-處理-輸出)
    - Input: input()函數
    - Process: 指定敘述(assignment)
    - Process:內建基本函數的使用(help, type)
    - Output: print()函數
- Advanced-進階的
  - 關於Python 程式語言
    - Python編輯器:IDLE, Spyder, Visual Studio Code, PyCharm
    - Python程式的執行 (Run)
    - Python程式的偵錯 (Debug)

(A) ESSENTIAL-基本的

啟思博教學法

Kissipo = KISS principle + IPO model

啟思博Kissipo 學習法

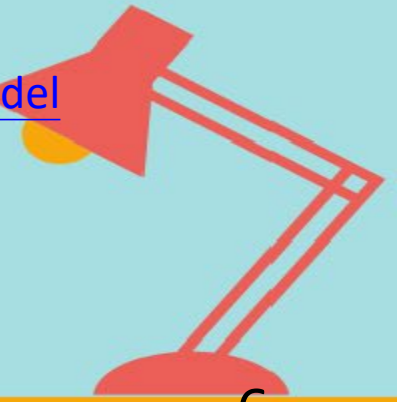
Kissipo = KISS principle + IPO model

KISS principle

"keep it simple, stupid" or "keep it stupid simple", is a design principle noted by the U.S. Navy in 1960.
https://en.wikipedia.org/wiki/KISS_principle

IPO model

The input–process–output (IPO) model is a widely used approach in systems analysis and software engineering for describing the structure of an information processing program or other process.
https://en.wikipedia.org/wiki/IPO_model



Kissipo Learning for Programming with Python(PWP)

Courseware: Notebook+ Github

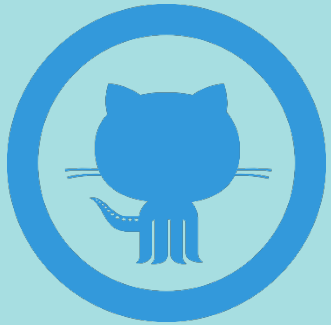
(1) 使用Notebook(Google Colab)教學。
(2) 使用Github建立教案

Keep:

Variables and assignment
operator and expression
left-hand side and right-hand side
unpacking

S&S:

help(), type(), len(), size()



IPO-I: input

input()
int(), float(), str()
split(), map()

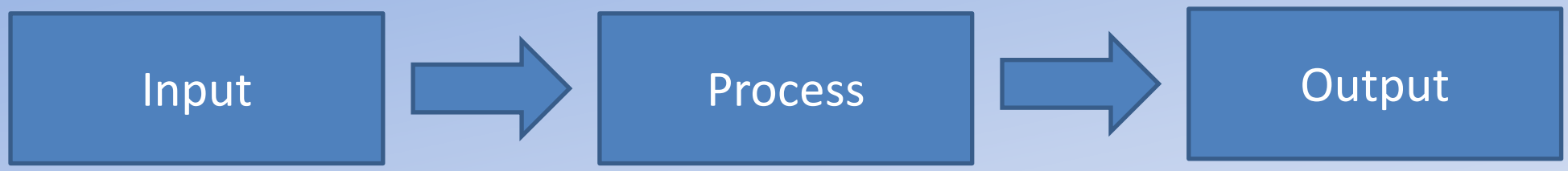
IPO-P: Process

變數宣告, 資料容器
for-loop/while-loop
if, elif, else
range()

IPO-O: output

print()
open(), write()

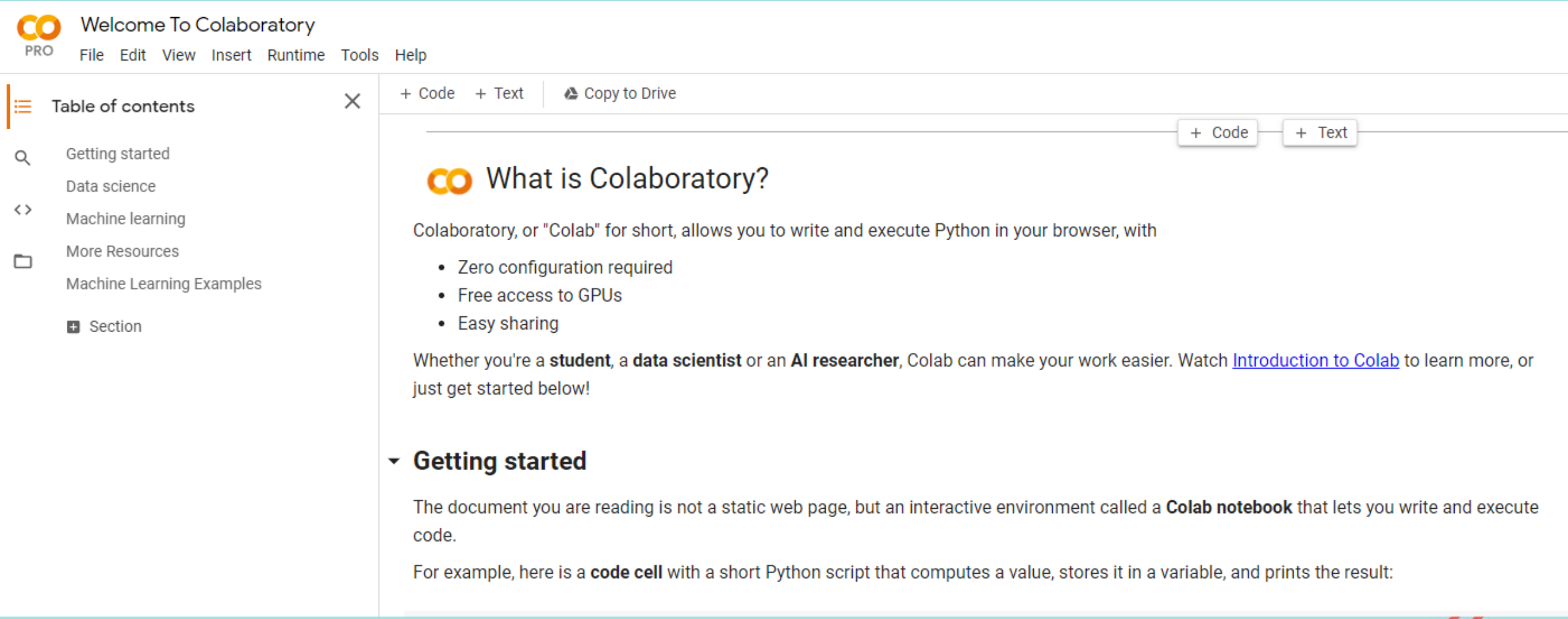
IPO Model



input()　　help(), type()　　print()

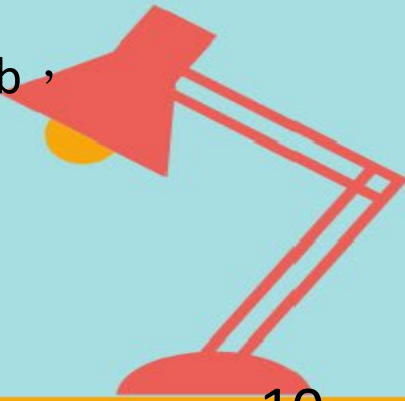
本章基本觀念是同學要知道：
輸入用input(), 輸出用print()
help()可以查看函數或類別的說明
type()可以查看變數的型別

使用Notebook(Google Colab)教學



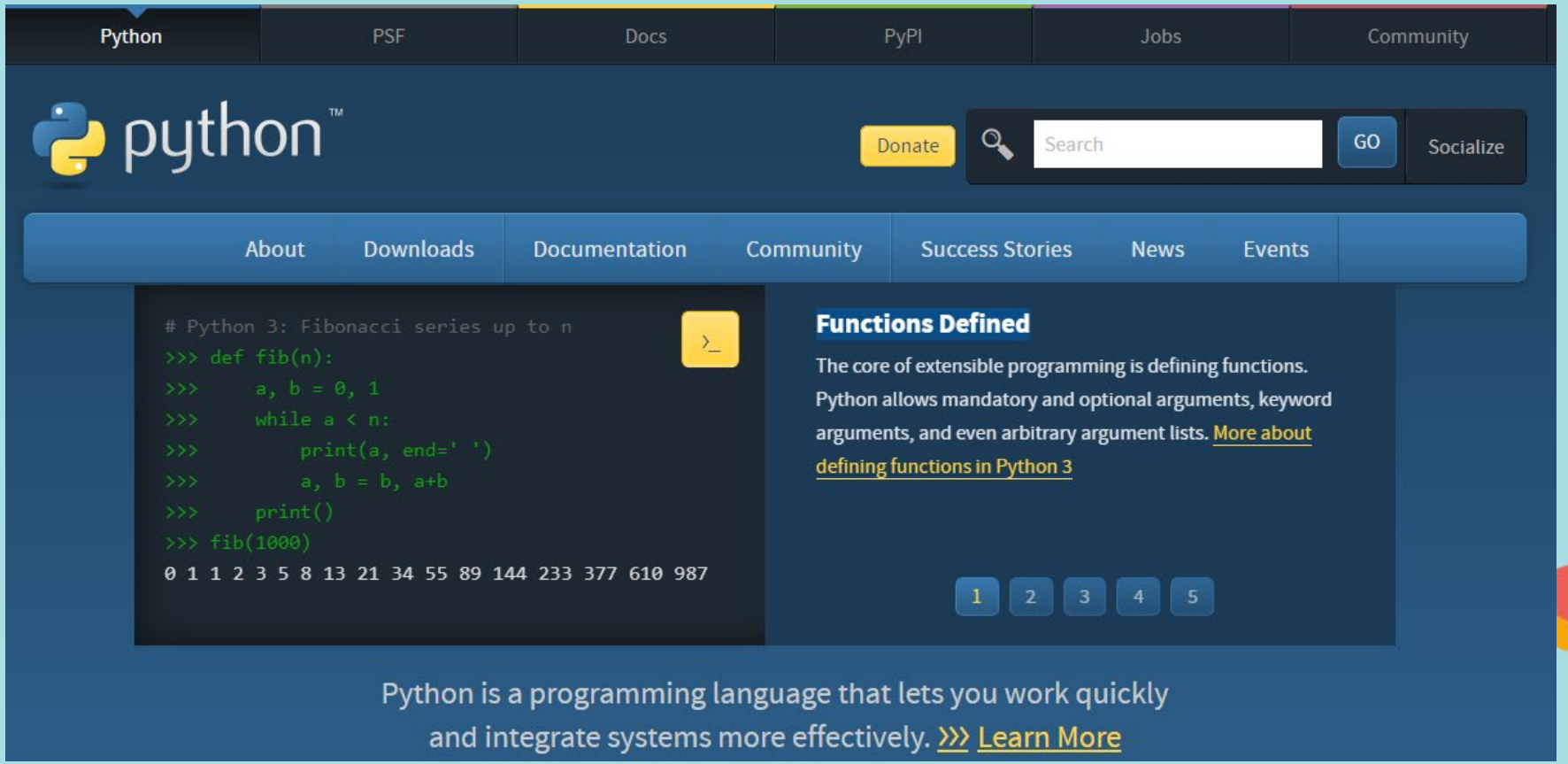
Jupyter Notebooks

- Jupyter是一個非營利組織，旨在「為數十種程式語言的互動式計算開發開源軟件，開放標準和服務」。
- 2014年由Fernando Pérez從IPython中衍生出來，Jupyter支援幾十種語言的執行環境。
- Jupyter Project的名稱是對Jupyter支援的三種核心程式語言的引用，這三種語言是Julia、Python和R。
- 也是對伽利略記錄發現木星的衛星的筆記本的致敬。
- Jupyter專案開發Jupyter Notebook、JupyterHub和JupyterLab，這是Jupyter Notebook的下一代版本。



https://zh.wikipedia.org/wiki/Jupyter

Python官網的介紹



Python的版本

- 目前版本~~Python 2.7.x~~和Python 3.8.x
- **print 函数**
- **Unicode**
- **除法運算 //**

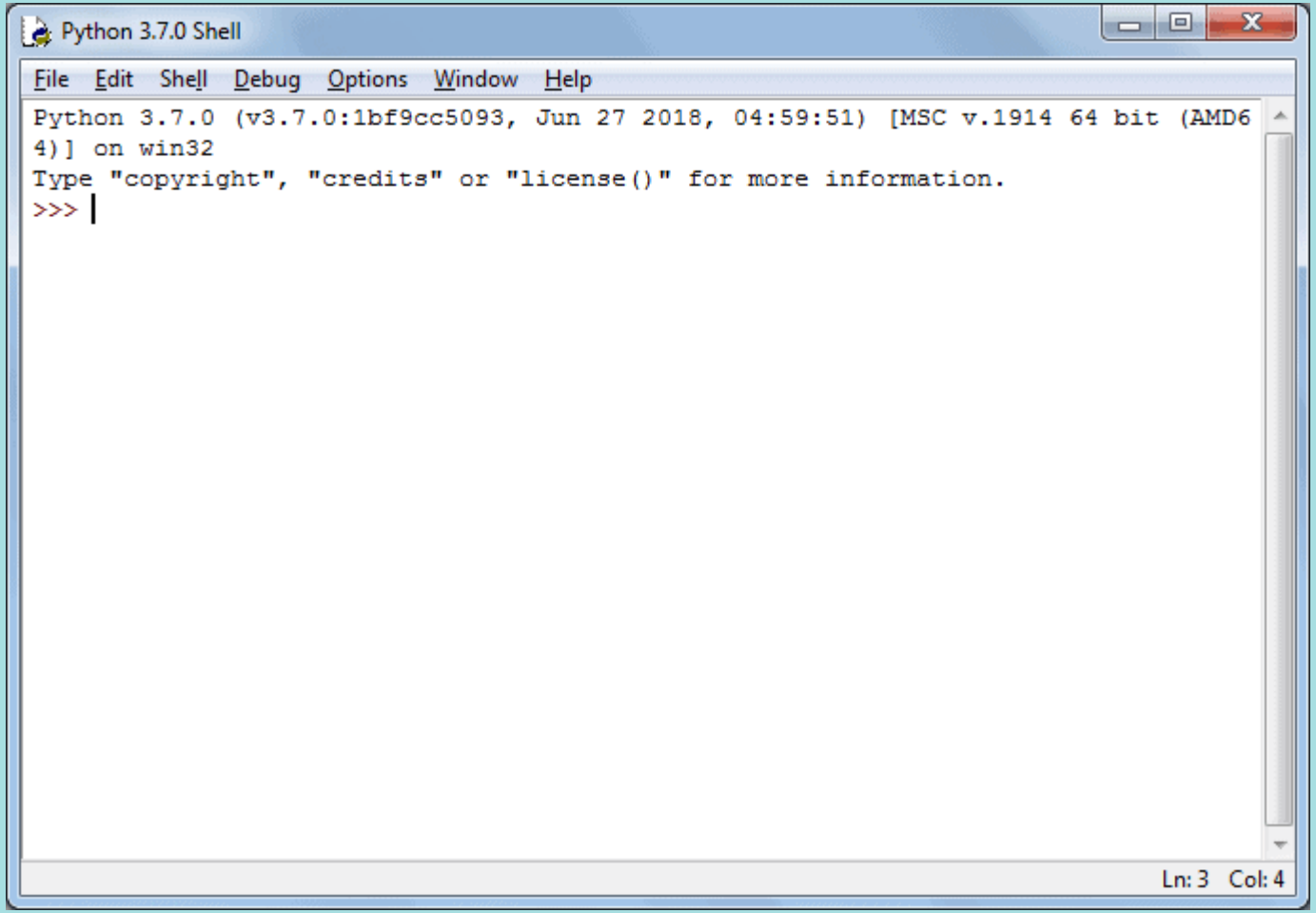
Sunsetting Python 2

(B) ADVANCED-進階的

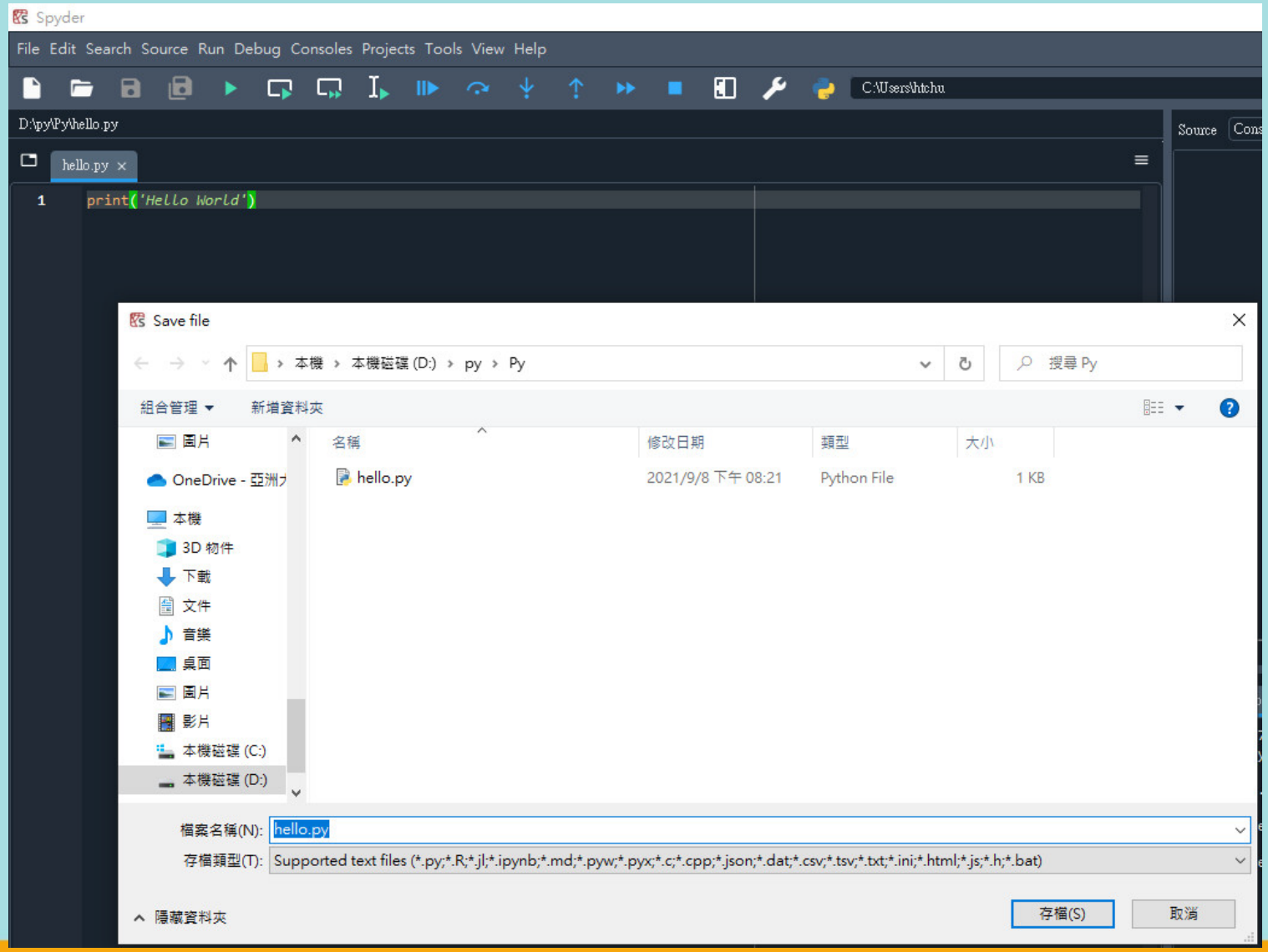
Python程式的編輯工具

- Python IDLE工具
- Spyder
- Visual Studio Code
- PyCharm
- Colab

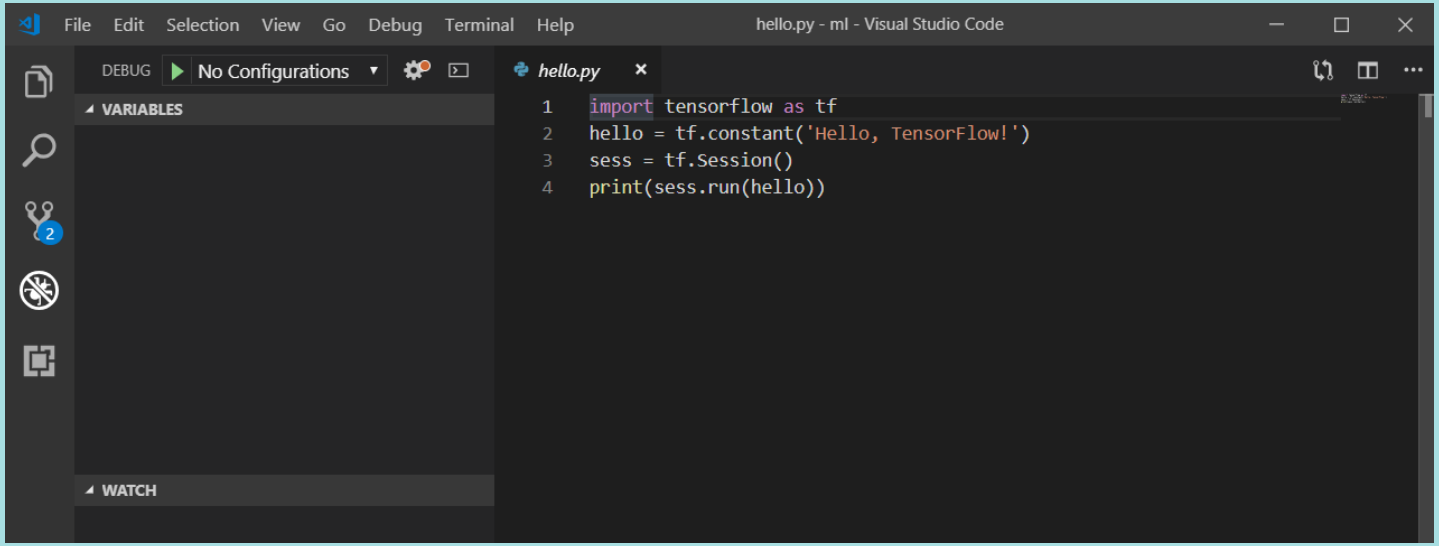
Python IDLE


Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
Ln: 3 Col: 4

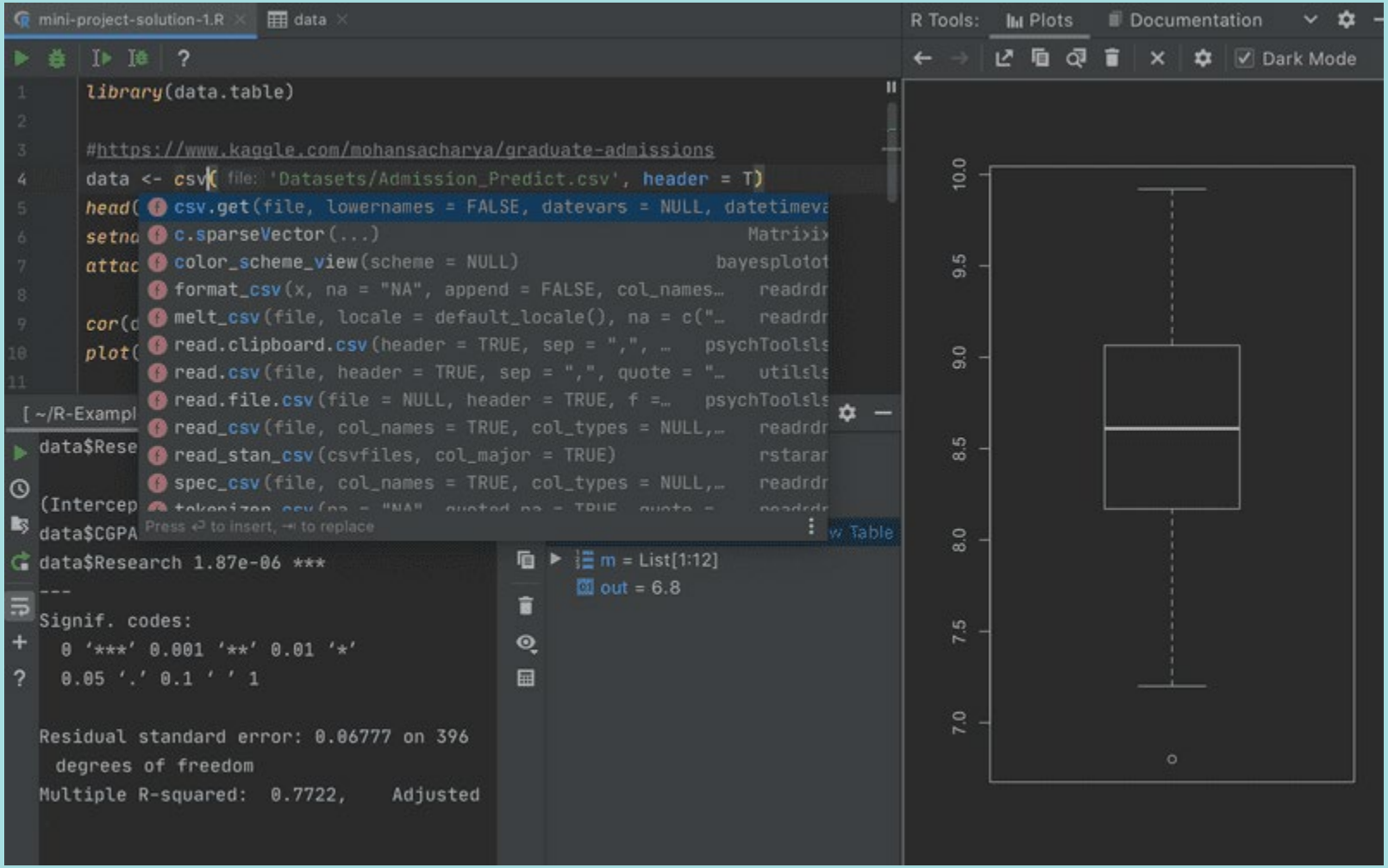
Spyder


Spyder
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Users\htchu
D:\py\Py\hello.py
hello.py
1 print('Hello World')
Source
Save file
本機 › 本機磁碟 (D:) › py › Py
搜尋 Py
組合管理
新增資料夾
名稱
修改日期
類型
大小
hello.py
2021/9/8 下午 08:21
Python File
1 KB
OneDrive - 亞洲
本機
3D 物件
下載
文件
音樂
桌面
圖片
影片
本機磁碟 (C:)
本機磁碟 (D:)
檔案名稱(N): hello.py
存檔類型(T): Supported text files (*.py;*.R;*.jl;*.ipynb;*.md;*.pyw;*.pyx;*.c;*.cpp;*.json;*.dat;*.csv;*.tsv;*.txt;*.ini;*.html;*.js;*.h;*.bat)
隱藏資料夾
存檔(S)
取消

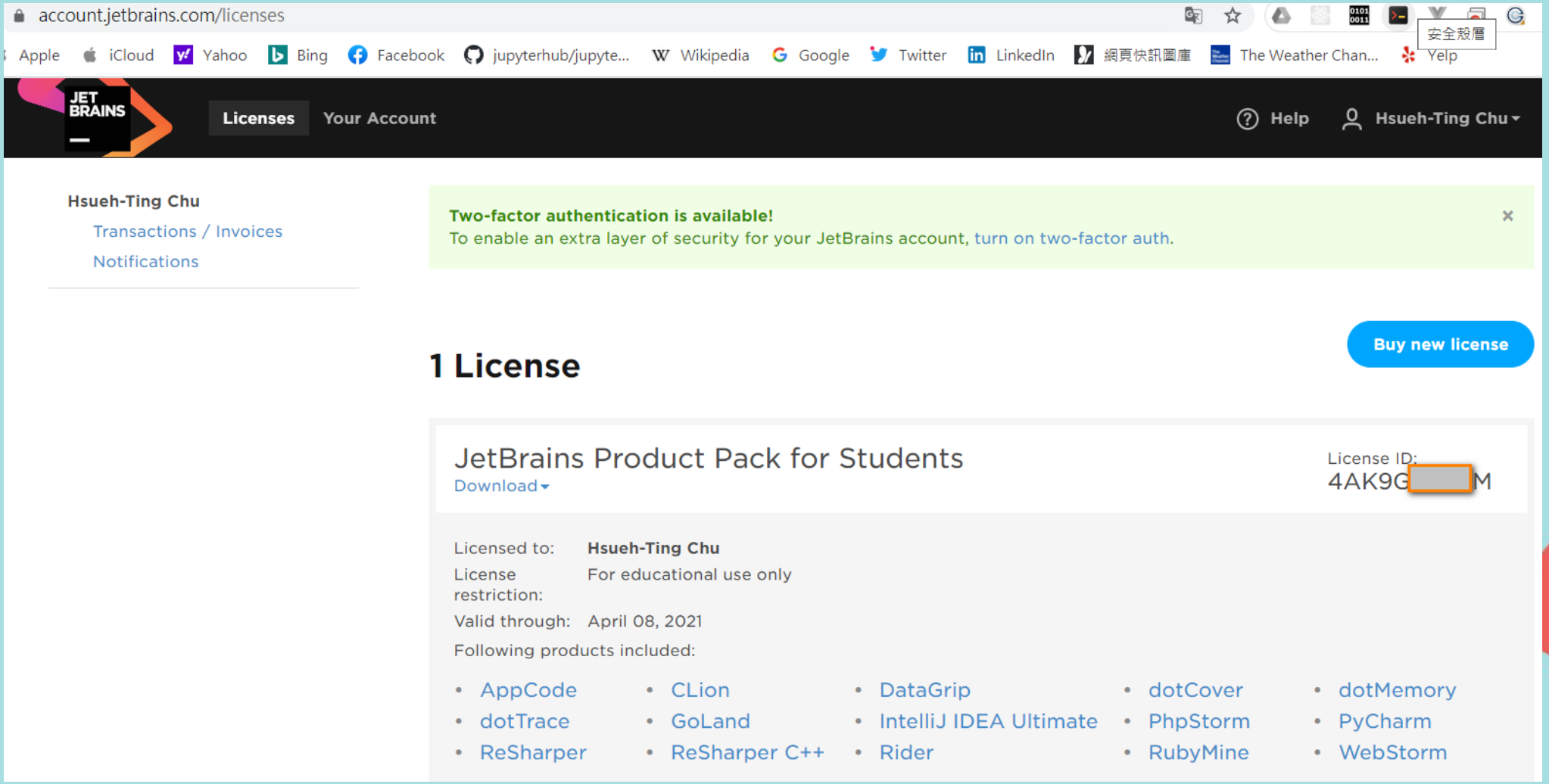
Visual Studio Code



PyCharm


mini-project-solution-1.R
data
library(data.table)
#https://www.kaggle.com/mohansacharya/graduate-admissions
data <- csv(file: 'Datasets/Admission_Predict.csv', header = T)
csv.get(file, lowernames = FALSE, datevars = NULL, datetimeva
c.sparseVector(...)
color_scheme_view(scheme = NULL)
format_csv(x, na = "NA", append = FALSE, col_names…
melt_csv(file, locale = default_locale(), na = c("…
read.clipboard.csv(header = TRUE, sep = ",", …
read.csv(file, header = TRUE, sep = ",", quote = "…
read.file.csv(file = NULL, header = TRUE, f =…
read_csv(file, col_names = TRUE, col_types = NULL,…
read_stan_csv(csvfiles, col_major = TRUE)
spec_csv(file, col_names = TRUE, col_types = NULL,…
Press ↵ to insert, ⇥ to replace
data$Research 1.87e-06 ***
Signif. codes:
0 '***' 0.001 '**' 0.01 '*'
0.05 '.' 0.1 ' ' 1
Residual standard error: 0.06777 on 396
degrees of freedom
Multiple R-squared: 0.7722, Adjusted
m = List[1:12]
out = 6.8
R Tools:
Plots
Documentation
Dark Mode
10.0
9.5
9.0
8.5
8.0
7.5
7.0

JetBrains Product Pack for Students



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Thanks!

Q&A