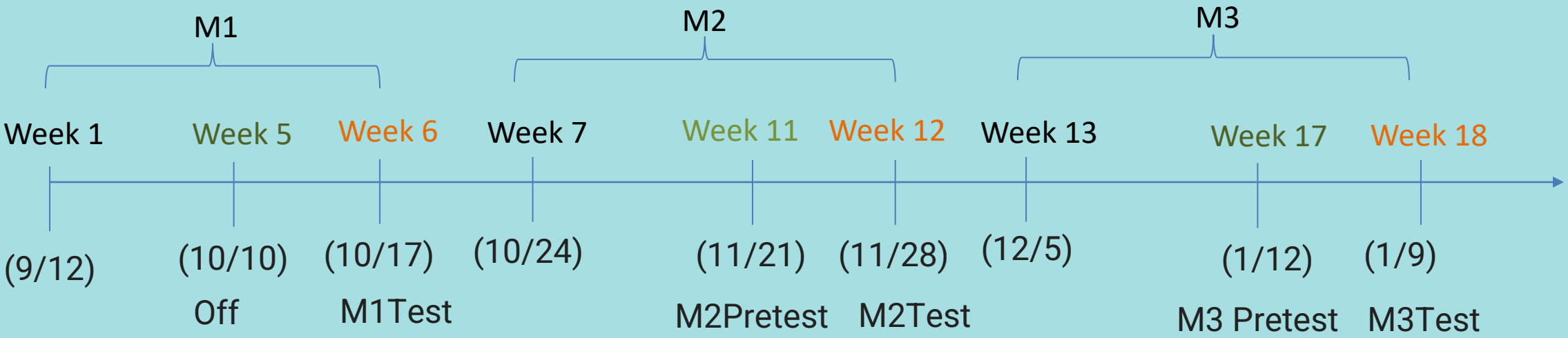
Fundamental Programming Course

Week 1

Asia University

Schedule


M1
M2
M3
Week 1
Week 5
Week 6
Week 7
Week 11
Week 12
Week 13
Week 17
Week 18
(9/12)
(10/10)
Off
(10/17)
M1Test
(10/24)
(11/21)
M2Pretest
(11/28)
M2Test
(12/5)
(1/12)
M3 Pretest
(1/9)
M3Test

Syllabus

- W1-Python Introduction and Programming Tools
- W2-Variables and Operations
- W3-Loop and formatted output
- W4-Condition and Containers
- W5-String and built-in functions
- W6-M1 test
- W07-Dictionary Container
- W08-File I/O
- W09-Function
- W10-Advanced flow control
- W11-Advanced operations and generators
- W12-M2 test

- W13-Advanced functions
- W14-Class fundamentals (classes, objects, properties, constructors, methods)
- W15-Advanced Classes (Static methods, class Methods and class decorators)
- W16-Modules and Packages
- W17-Advanced programming(Argparse and Venv)
- W18-M3 test

Content

- Essential
  - Kissipo Learning)
    - KISS Principle: Colab + Github
    - Anaconda amd Jupyter notebook
  - Hello World
  - IPO model: input–process–output
    - Input: input()
    - Process: assignment
    - Process: Use of built-in basic functions (help, type)
    - Output: print()
- Advanced
  - AboutPython
    - Editor:IDLE, Spyder, Visual Studio Code, PyCharm
    - Run
    - Debug

(A) ESSENTIAL

Kissipo

Kissipo = KISS principle + IPO model

Kissipo Learning

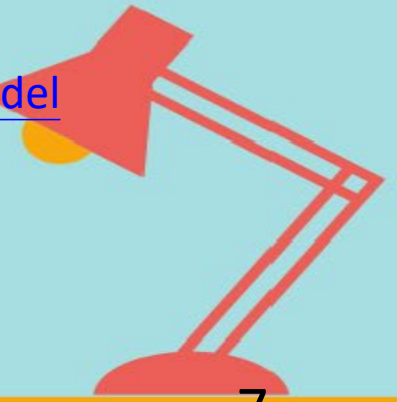
Kissipo = KISS principle + IPO model

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

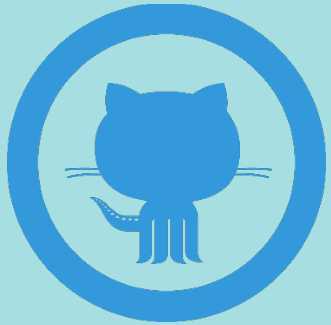
(1) Notebook(Google Colab)。
(2) Github

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()

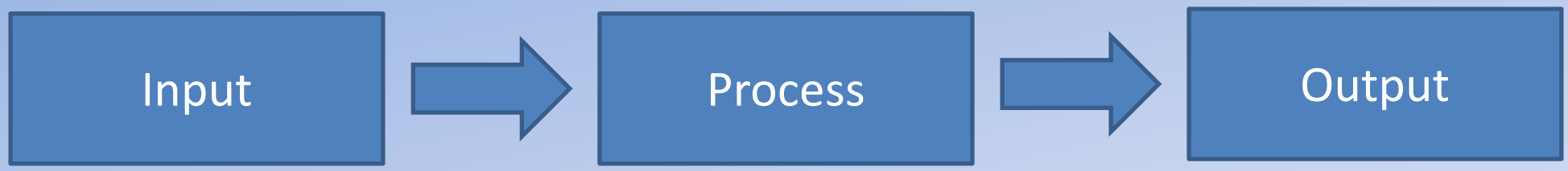
IPO-P: Process

variable declaration,
data container
for-loop/while-loop
if, elif, else
range()

IPO-O: output

print()
open(), write()

IPO Model



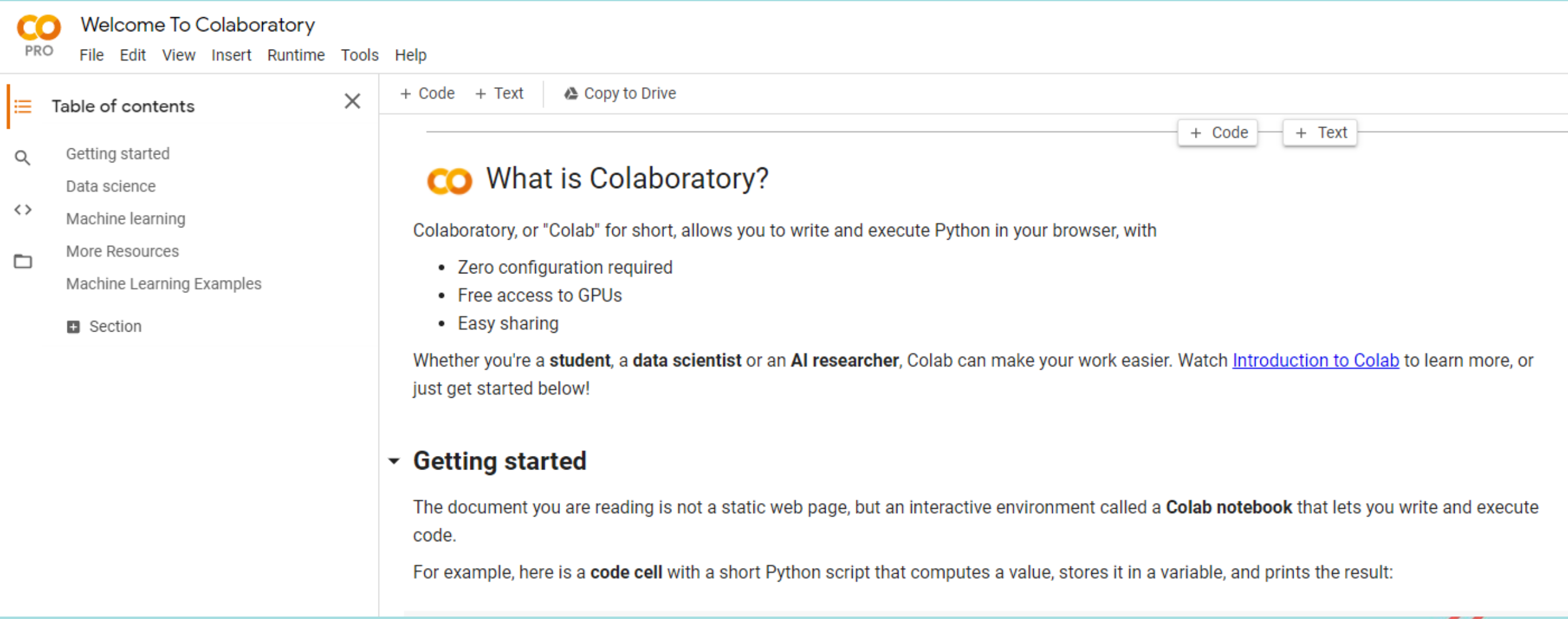
input()

help(), type()

print()

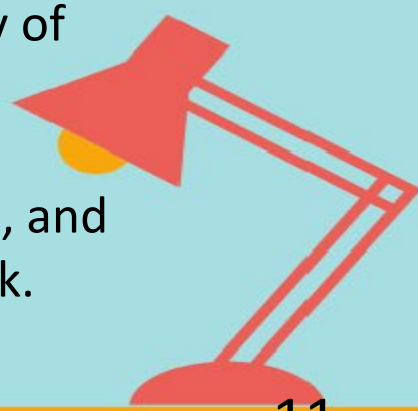
The basic idea of this chapter is that students should know:
Input with input(), output with print()
help() can view the description of the function or category
type() can check the type of the variable

Notebook(Google Colab)



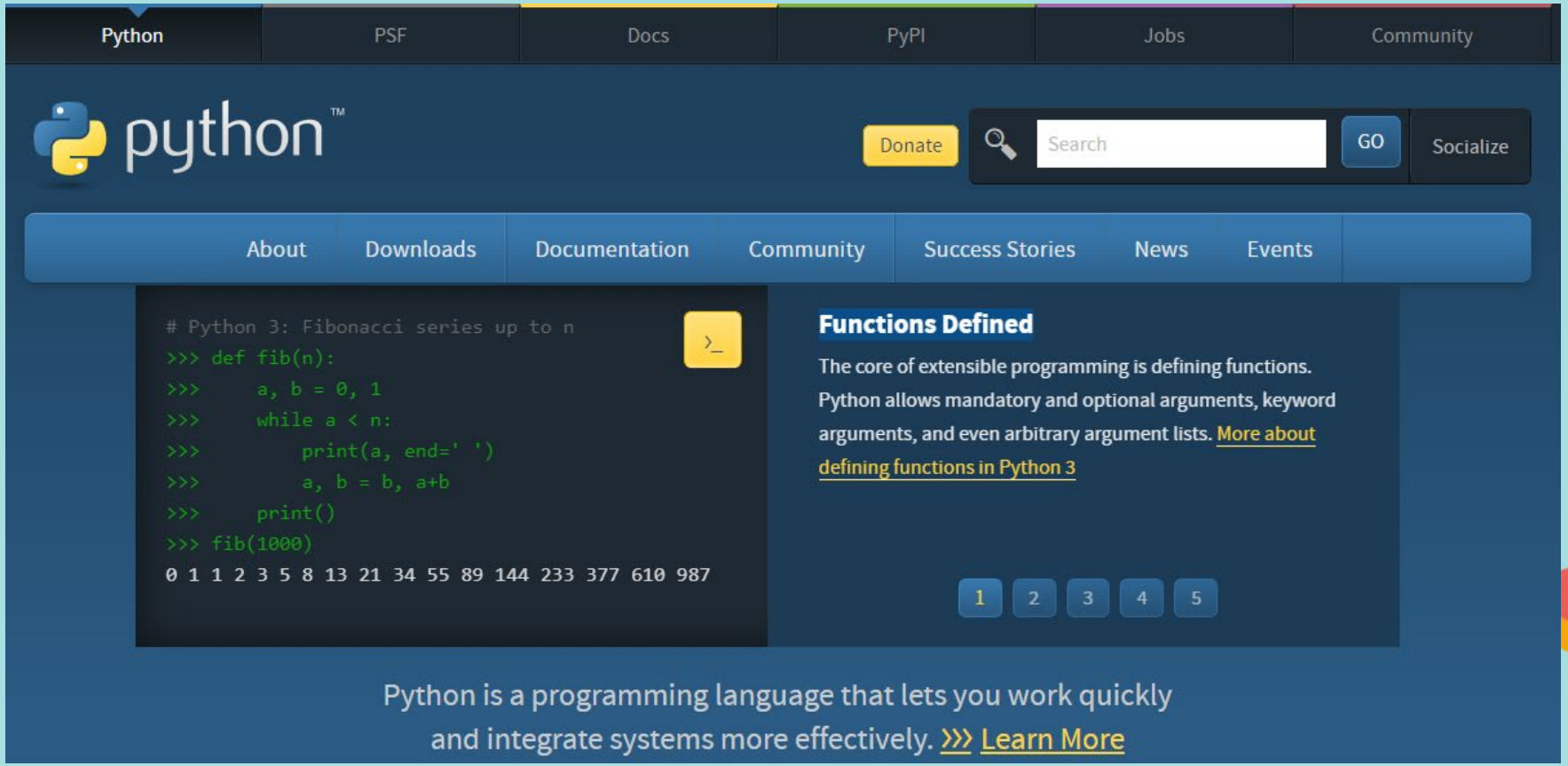
Jupyter Notebooks

- Jupyter is a non-profit organization that aims to "develop open source software, open standards and services for interactive computing in dozens of programming languages".
- Derived from IPython by Fernando Pérez in 2014, Jupyter supports execution environments in dozens of languages.
- The name of the Jupyter Project is a reference to the three core programming languages supported by Jupyter, which are Julia, Python, and R.
- Also a tribute to Galileo's notebooks recording the discovery of Jupiter's moons.
- The Jupyter Project develops Jupyter Notebook, JupyterHub, and JupyterLab, the next-generation version of Jupyter Notebook.



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

Python官網的介紹



Python Versions

- Version ~~Python 2.7.x~~ and Python 3.8.x
- **print**
- **Unicode**
- **Integer division operation //**

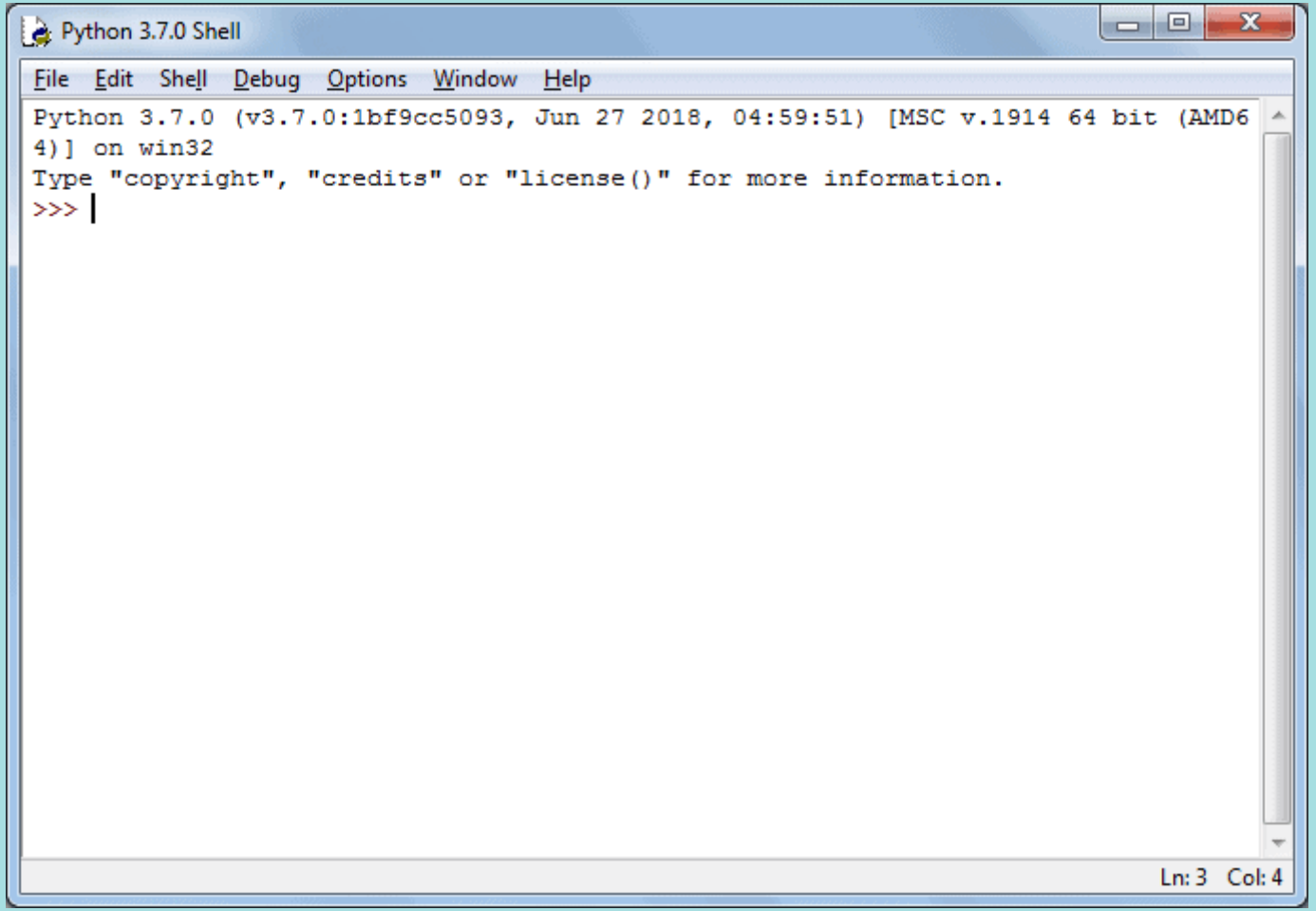
Sunsetting Python 2

(B) ADVANCED

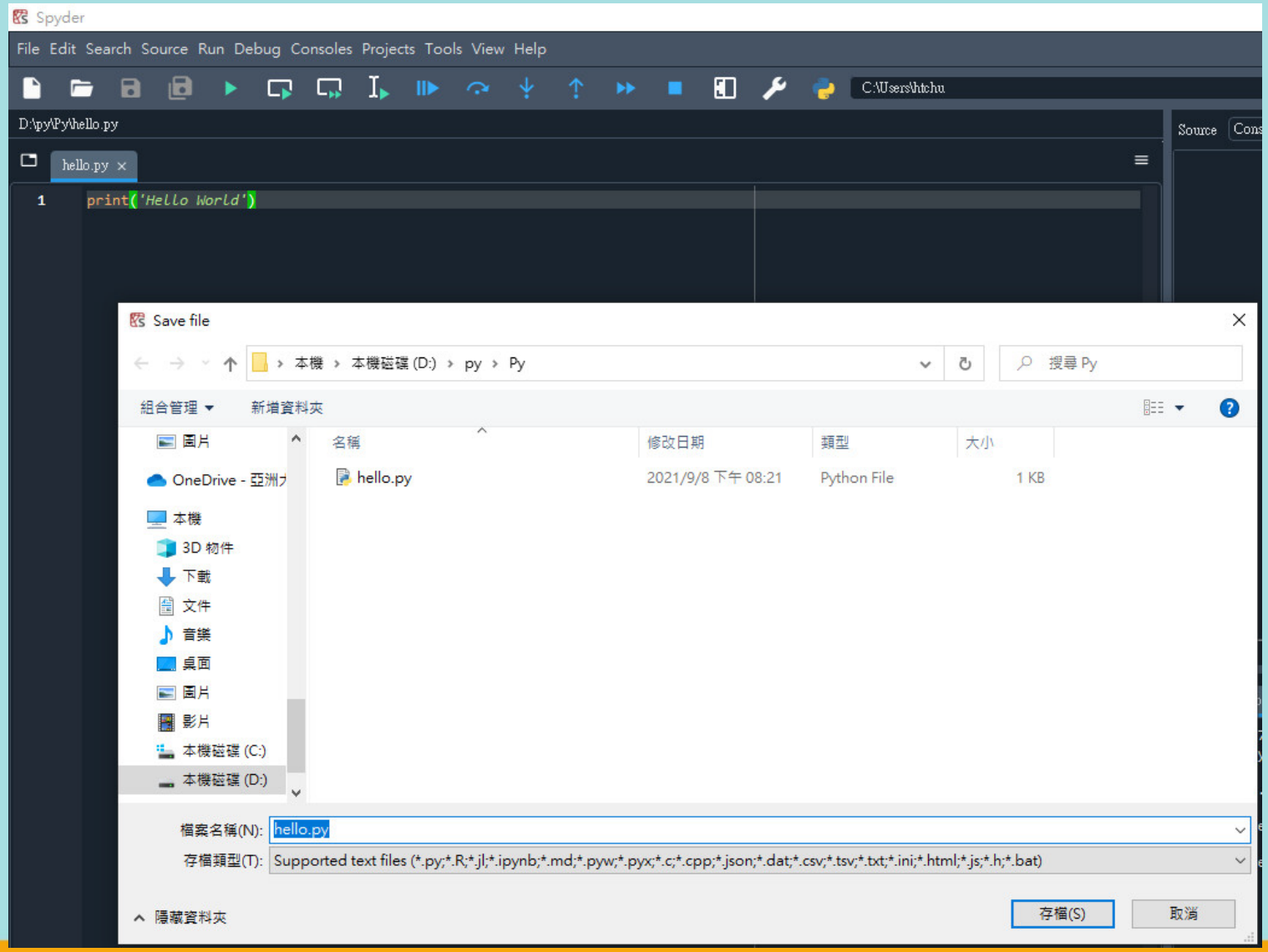
Python editors

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

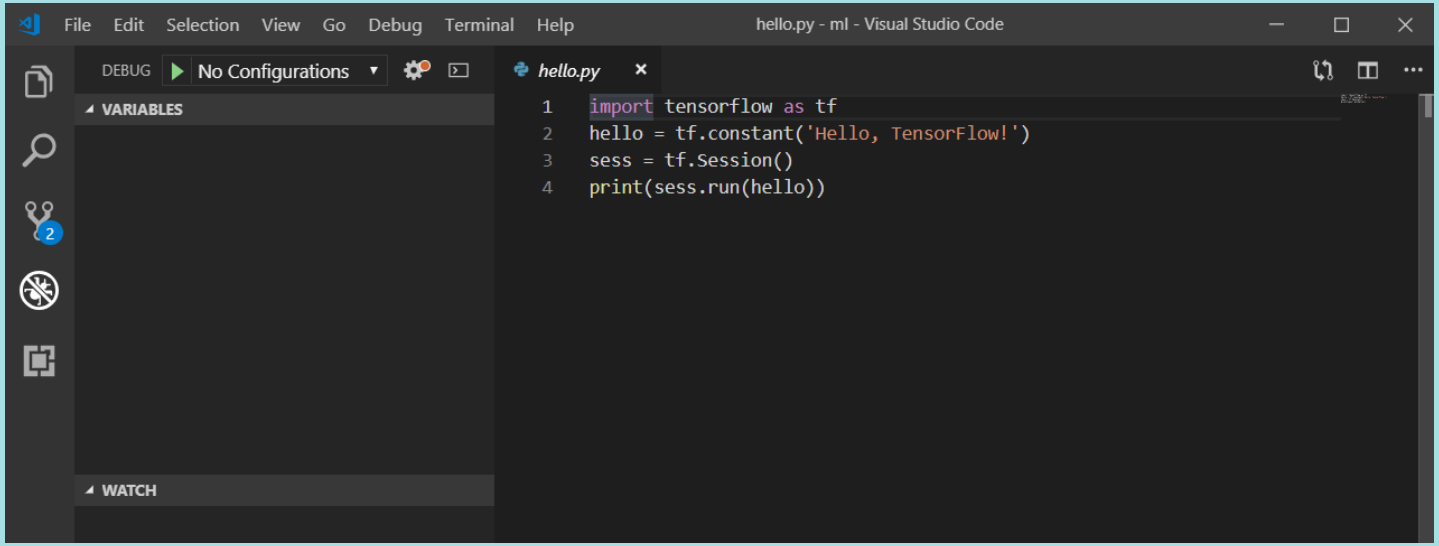
Python IDLE


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

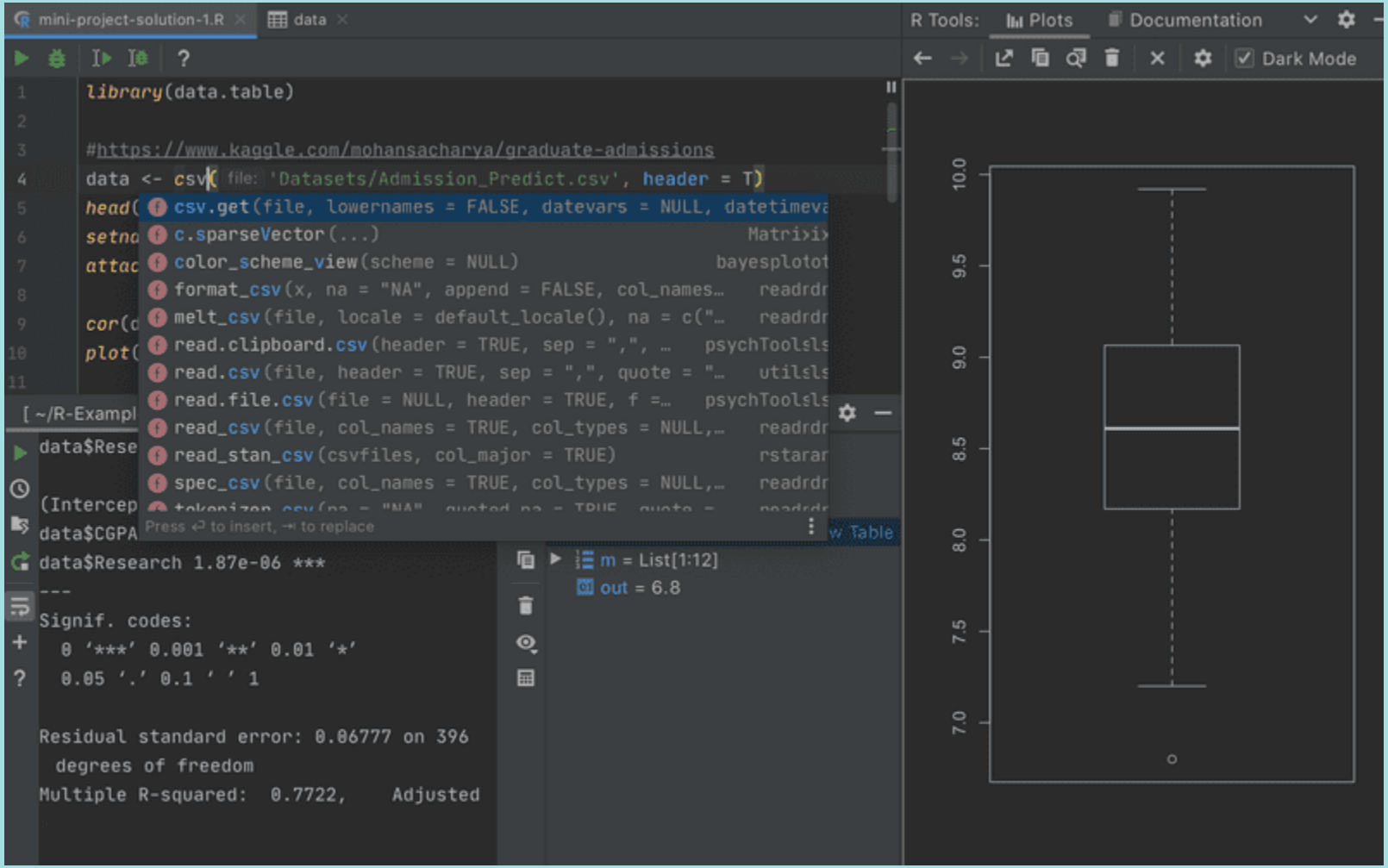
Spyder


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

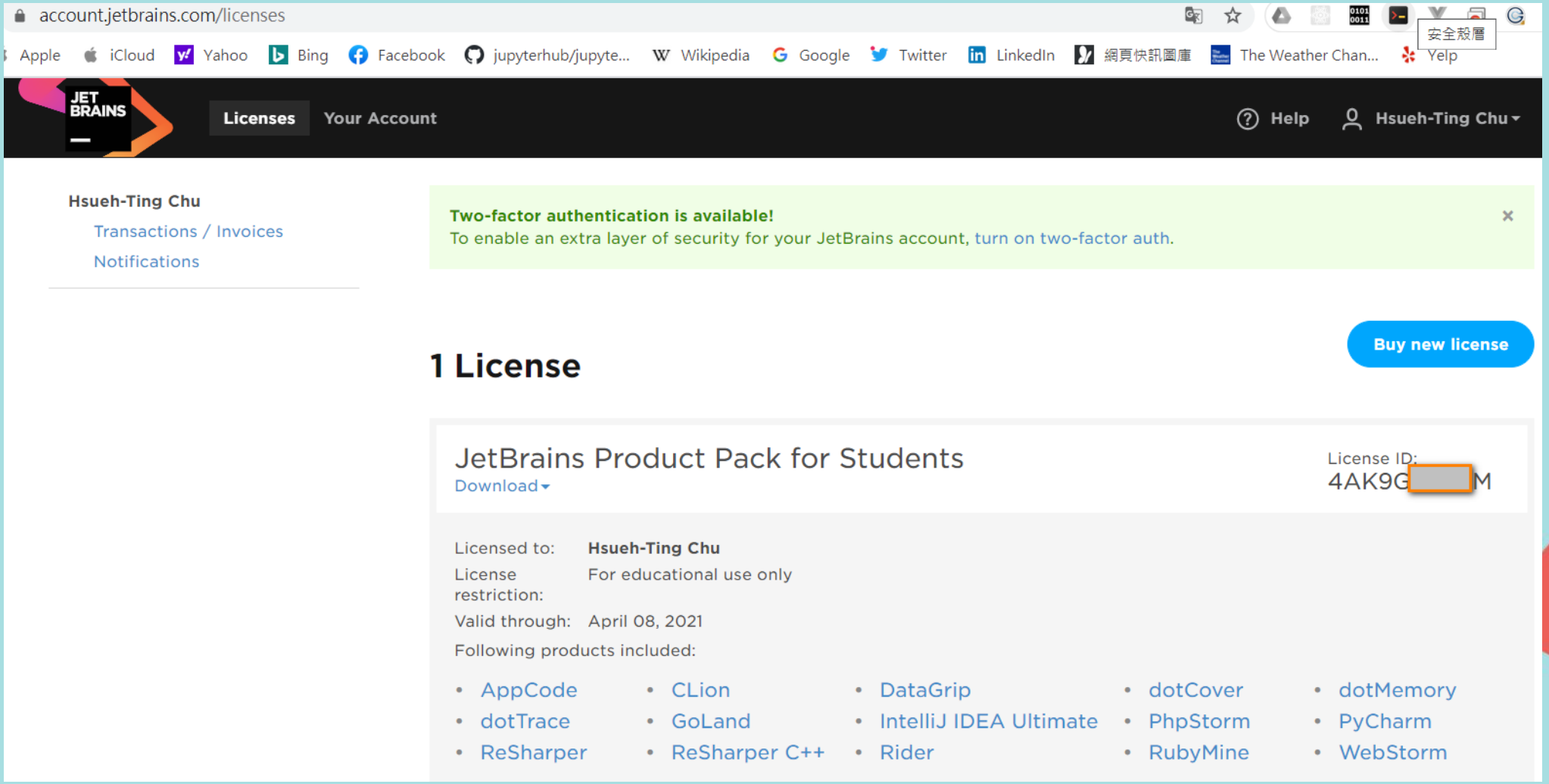


PyCharm


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)
head(
setna
attac
cor(
plot(
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
[~/R-Exampl
data$Rese
(Intercep
data$CGPA
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



https://account.jetbrains.com/licenses

Thanks!

Q&A