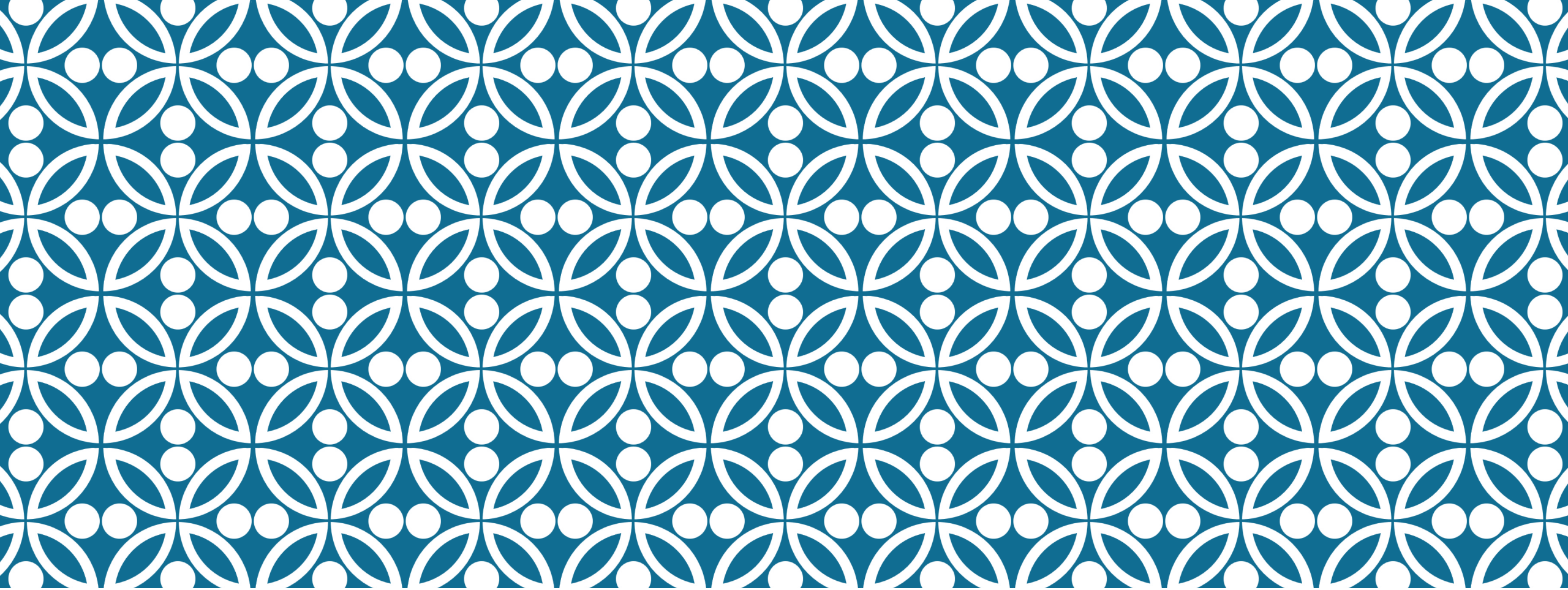


應用機器學習

Brian Chan 陳醒凡

課程目標

1. 了解基本的數據分析
2. 了解基本的機器學習(Machine Learning)方法
3. 掌握Python的基本操作和一些有用的package
4. 處理及從網上下載數據
5. 在Python上應用機器學習

今天課堂概要

Python基本操作：

1. 基本統計分析
2. 數據輸入和輸出
3. 有用的package（例如numpy和dataframe）
4. 定義函數
5. 製作圖表

SYNTAX

Hello world!

Indentation

Comments

Data types

- Strings
- Null
- Numbers
- Lists
- Dictionaries
- Booleans

OPERATORS

Arithmetic

String Manipulation

Logic comparison

Flow control

- If
- For loop

USEFUL PACKAGES

Numpy

Dataframe

SOME MORE

Import/export data

Plot graphs

POP-UP FIGURE

After applying : Tools > preferences > IPython console > Graphics > Backend : Automatic > **Just restart the kernel**

EXERCISE

Create a list with integer from 0 to 10 in ascending order.

創建一個list包含0到10的整數(按升序) 。

hints: use for loop and append

EXERCISE

Find smallest number in a list.

找出最小的數字是多少。

```
# generate a list array by random numbers
import numpy as np
Test = list(np.floor(np.random.rand(10)*100))
```

```
# hints: use for loop and create a variable carrying the minimum value through loop.
用loop和創建一個variable去記住最小的數字。
```

EXERCISE

Plot function y, where y = x^2.

繪出函數y = x^2 。

hints: create a array of y by loop.

EXERCISE

Write a function of y = a*x^2 + b*x + c and plot graph.

繪出函數y = a*x^2 + b*x + c 。

hints: you may need to define a function to

EXERCISE

Find average of a list array.

找出list array的平均數。

```
# generate a list array by random numbers
N_sim = 1e3
data  = np.random.randn(int(N_sim)) # int only
```

hints: use loop.

ASSIGNMENT

Folder contains two files which are *Ticker_list.xlsx* and *data.xlsx*.

文檔內有*Ticker_list.xlsx* and *data.xlsx* 。

Assignment:

(a) obtain a variable containing stock price data of stocks in *Ticker_list.xlsx*.

(b) plot the series.

任務:

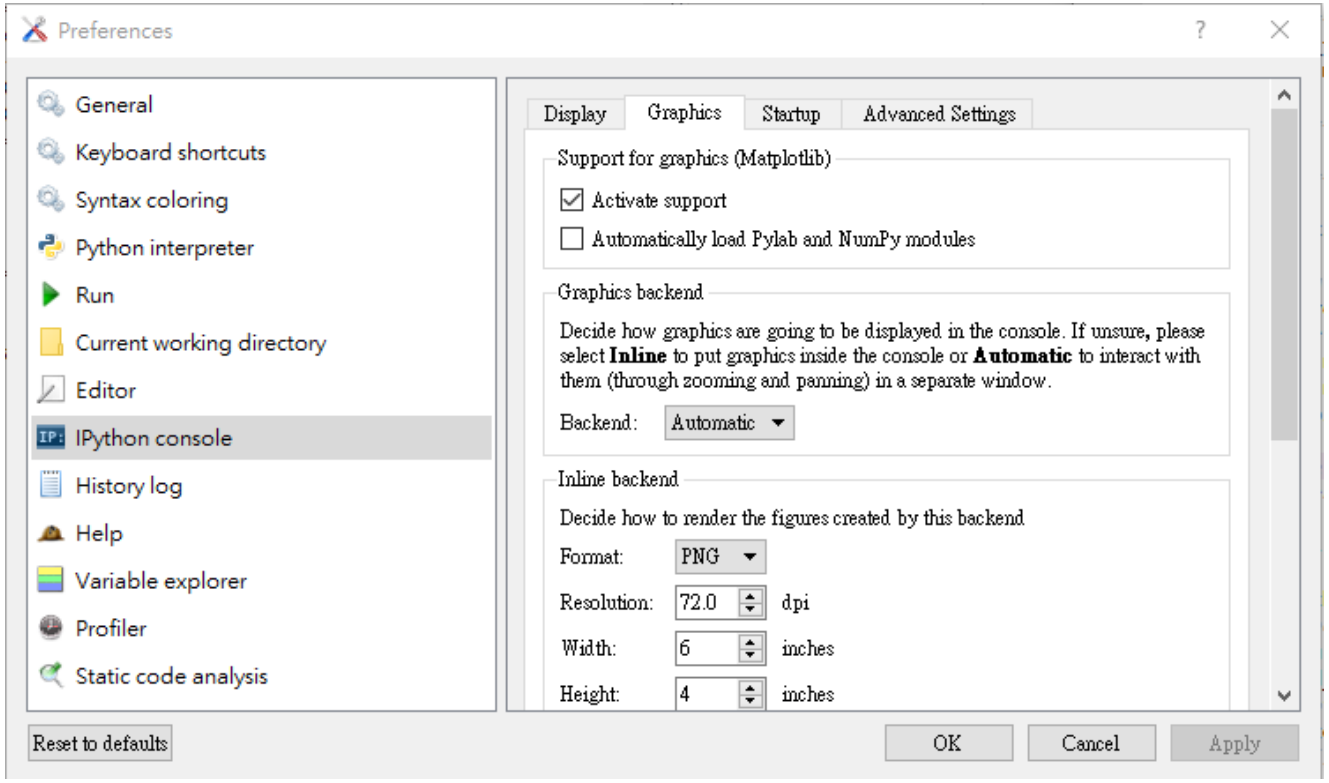
(a) 找出*Ticker_list.xlsx*內的股票的股價。

*(b)*繪出股票的股價。

SETTING POP-UP GRAPH ON SPYDER

1. Tools-> Preference ->IPython console->Graphics - > Graphics backend -> choose “Automatic”

2. Consoles -> Restart Kernel



下一課...

機器學習需要的基礎數學及統計學 (Optimization, probability and statistics)：

1. 基本統計學工具
2. 最優化(Optimization)及其基本觀念
3. 機率 (Probability)及其基本觀念
4. Bayesian probability
5. 統計學及其基本應用