Bioinformatics

wk01 TA hours

Introduction

2020/09/16

M.Y. HO

We have

a protein classification competition

at the end of the class!

Syllabus

Week 01 || 09/23	Introduction Python programming I	HW1	
Week 02 || 09/30	Python programming II	HW2	HW1 due
Week 03 || 10/07	Python package I Machine Learning	HW3 Final project	HW2 due
Week 04 || 10/21	Python package II	HW4(?)	HW3 due
Week 05 || 11/04	How to improve your model		HW4 due
Week 06 || 11/11	More information Student presentation		Final project

CONTENT

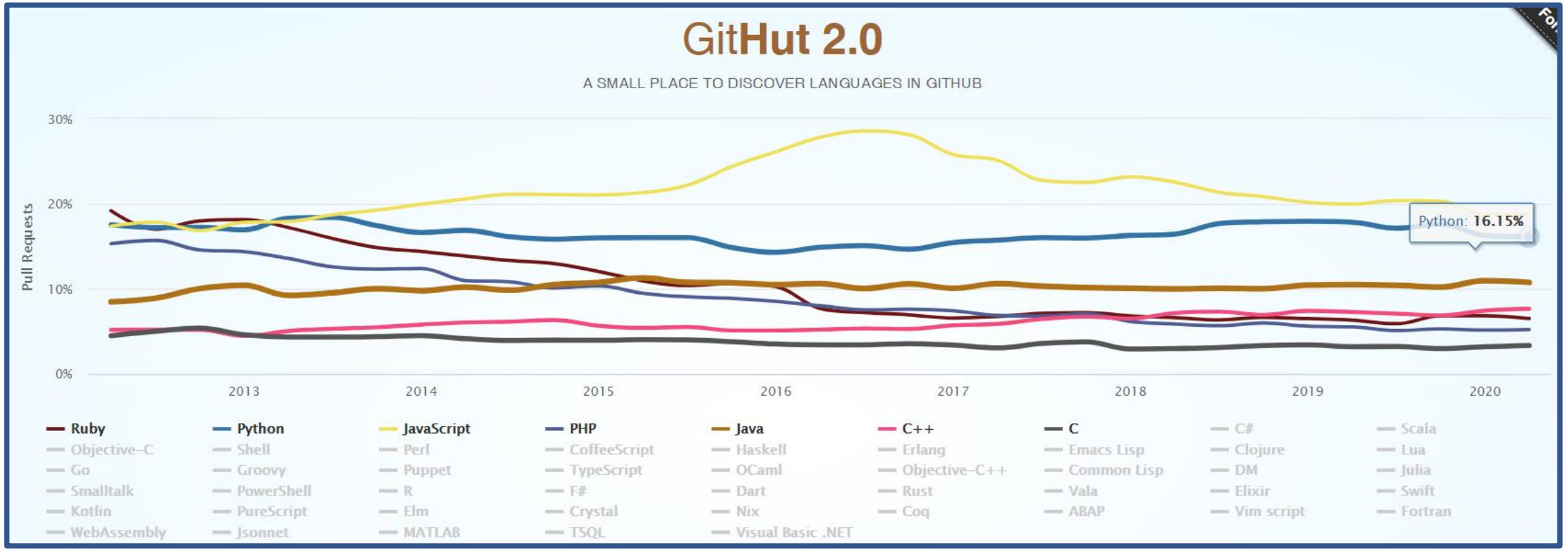
有無Programming經驗(any language)

家中電腦/筆電 OS

Part 1

為何要使用Python

為何要使用Python
Popularity



https://madnight.github.io/githut/#/pull_requests/2020/2

為何要使用Python
Popularity

Year: 2020 | Quarter: 2

# Ranking	Programming Language	Percentage (Change)	Trend
1	JavaScript	18.789% (-1.133%)	
2	Python	16.108% (-1.694%)	
3	Java	10.731% (+0.250%)	
4	Go	8.922% (+1.006%)	
5	C++	7.636% (+0.383%)	
6	TypeScript	7.334% (+1.919%)	^
7	Ruby	6.492% (+0.196%)	v
8	PHP	5.198% (-0.318%)	v
9	C#	3.797% (-0.204%)	
10	C	3.320% (+0.130%)	

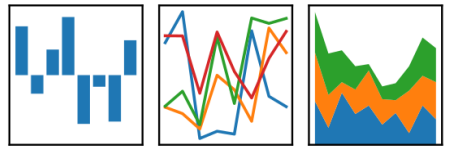
https://madnight.github.io/githut/#/pull_requests/2020/2

為何要使用Python

Versatility

hacking PWNTOOLS

web django

數據處理  NumPy pandas $y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$ 

視覺化 matplotlib Seaborn

生物資訊 biopython PyMOL

爬蟲 BeautifulSoup  Scrapy

機器學習 scikit learn PyTorch TensorFlow

Part 2

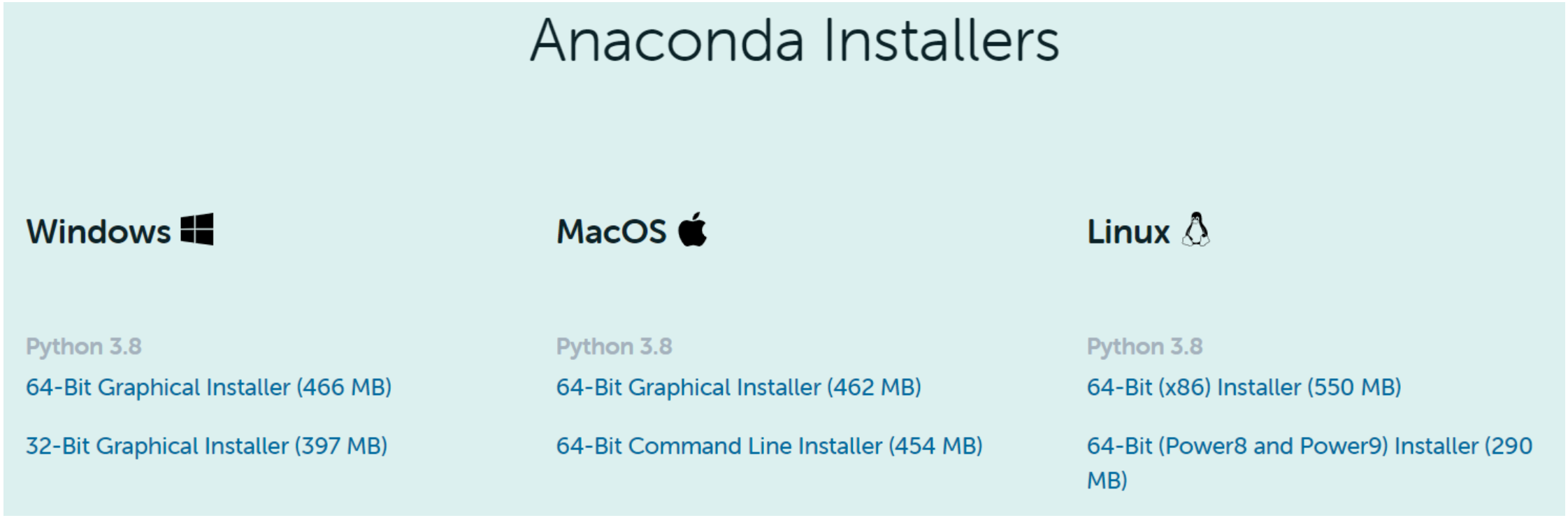
環境建置

環境建置

Anaconda

環境建置

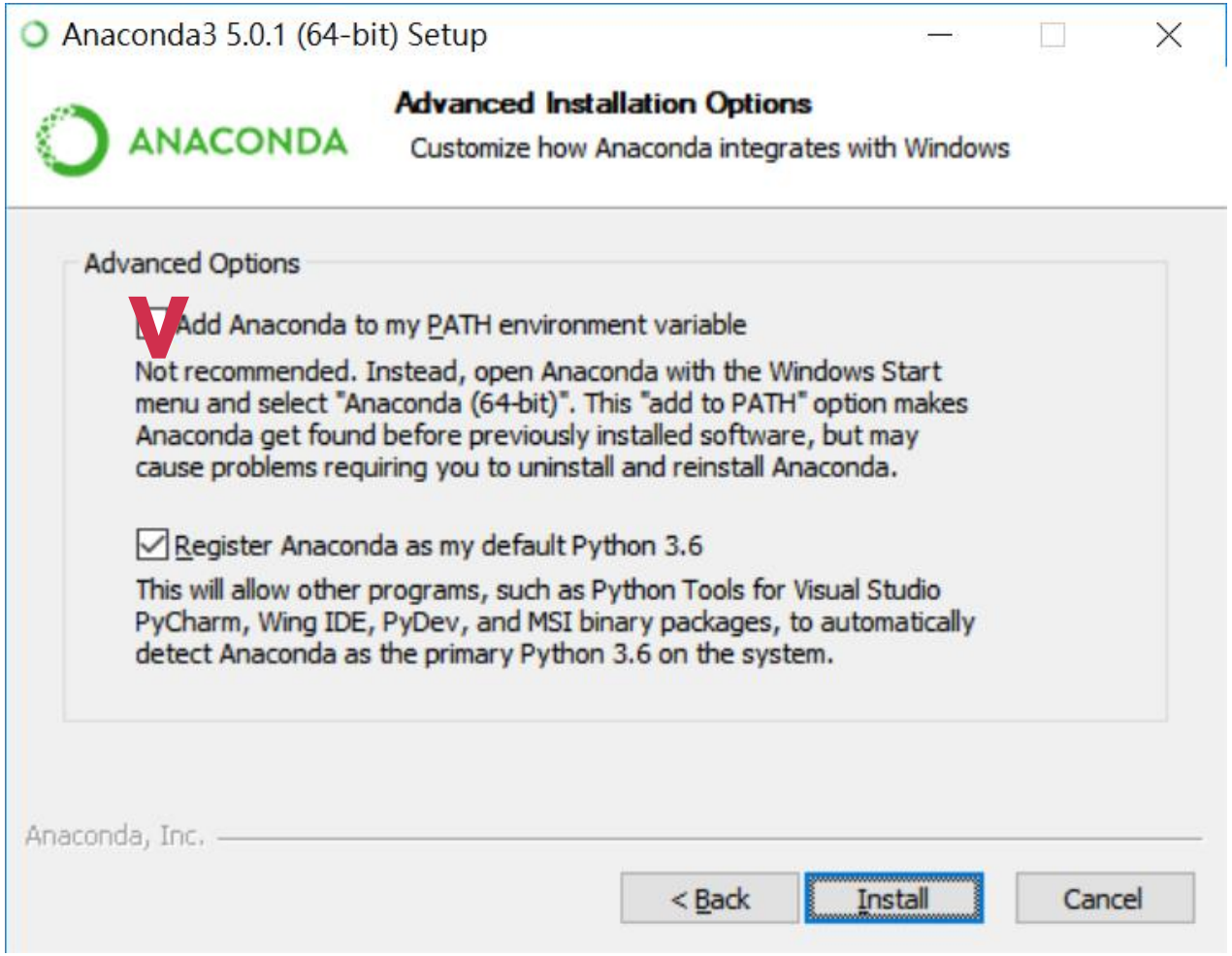
Anaconda



https://www.anaconda.com/products/individual

環境建置

Anaconda (windows)



環境建置

Anaconda (windows)

環境建置

Anaconda (linux)

https://repo.anaconda.com/archive/

Anaconda installer archive

Filename	Size	Last Modified	MD5
Anaconda3-2020.07-Linux-ppc64le.sh	290.4M	2020-07-23 12:16:47	daf3de1185a390f435ab80b3c2212205
Anaconda3-2020.07-Linux-x86_64.sh	550.1M	2020-07-23 12:16:50	1046c40a314ab2531e4c099741530ada
Anaconda3-2020.07-MacOSX-x86_64.pkg	462.3M	2020-07-23 12:16:42	2941ddbaf0cdb49b342c18cde51fee43
Anaconda3-2020.07-MacOSX-x86_64.sh	454.1M	2020-07-23 12:16:44	50f20c90b8b5bfdc09759c09e32dce68
Anaconda3-2020.07-Windows-x86.exe	397.3M	2020-07-23 12:16:51	aa7dcf4d02baa25d14baf5728e29d067

```
$ curl -O https://repo.anaconda.com/archive/Anaconda3-2020.07-Linux-x86_64.sh
```

```
$ sha256sum Anaconda3-2019.03-Linux-x86_64.sh
```

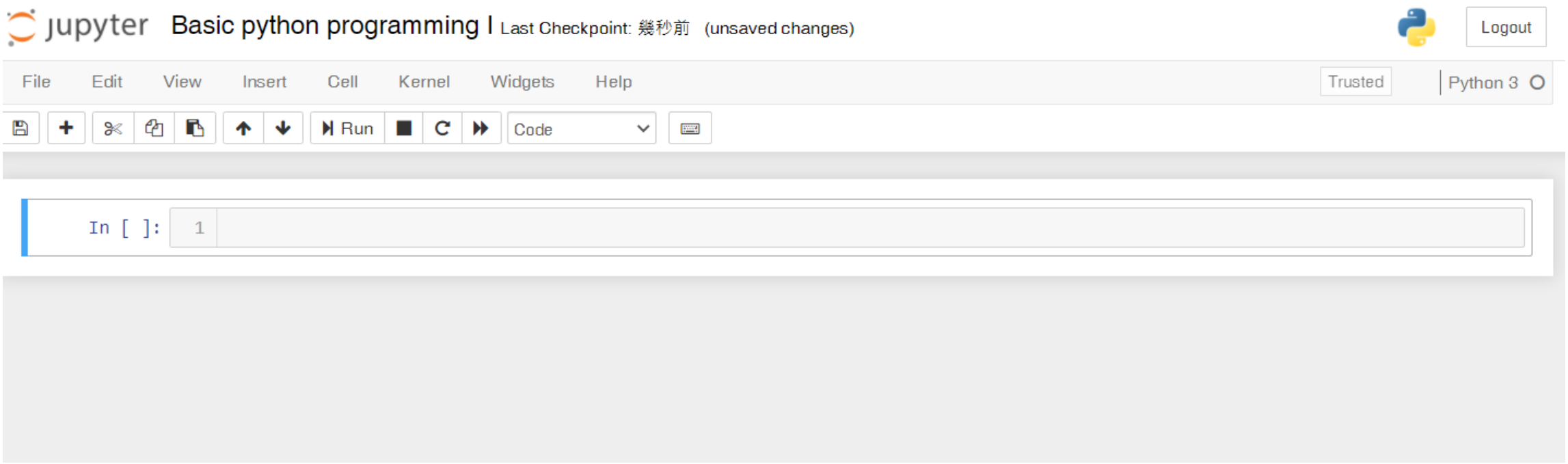
(Option)

```
$ bash Anaconda3-2020.07-Linux-x86_64.sh
```

```
$ source ~/.bashrc
```

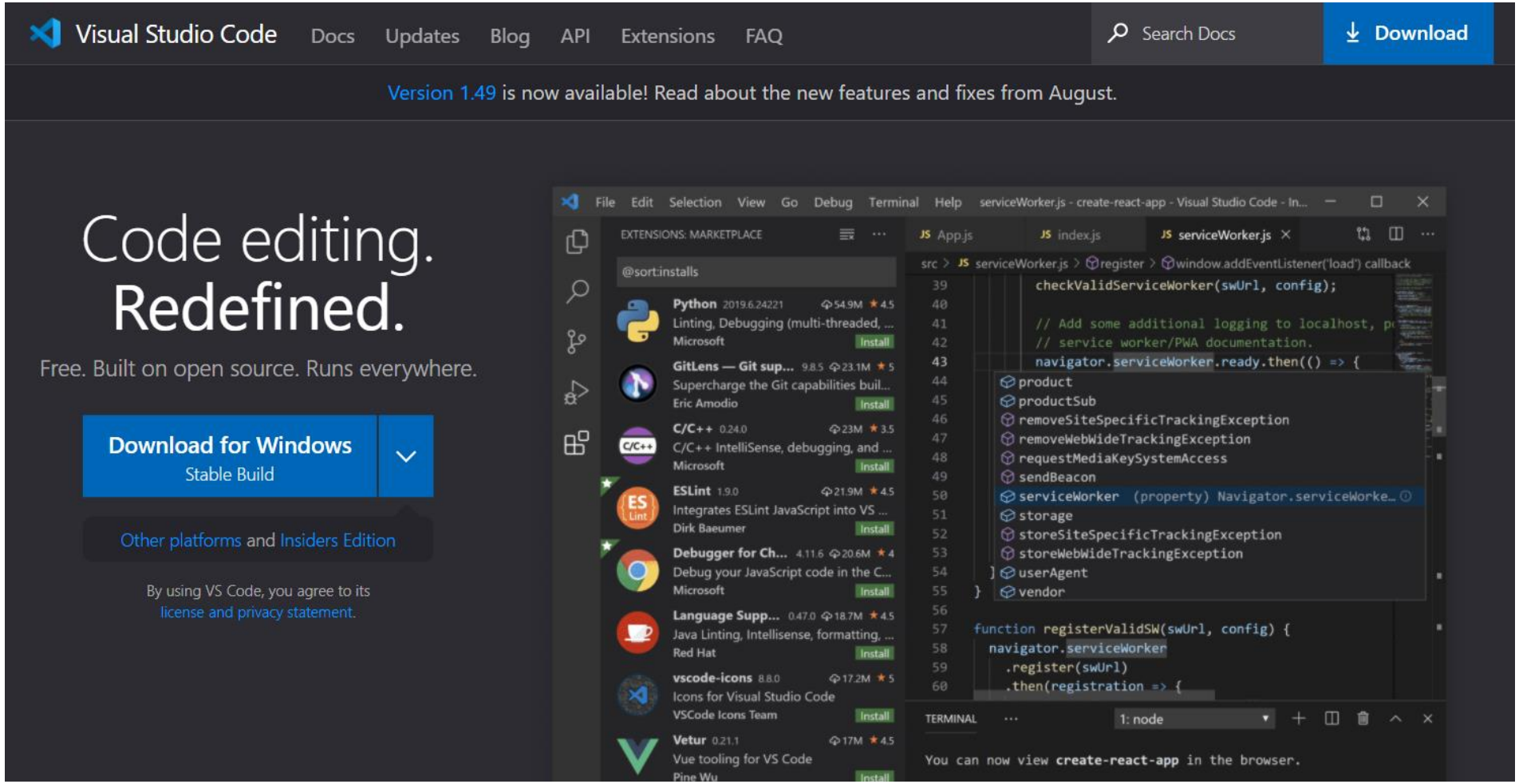
```
$ nohup jupyter notebook --port 8888 --ip=0.0.0.0 --allow-root &
```

環境建置
Jupyter notebook

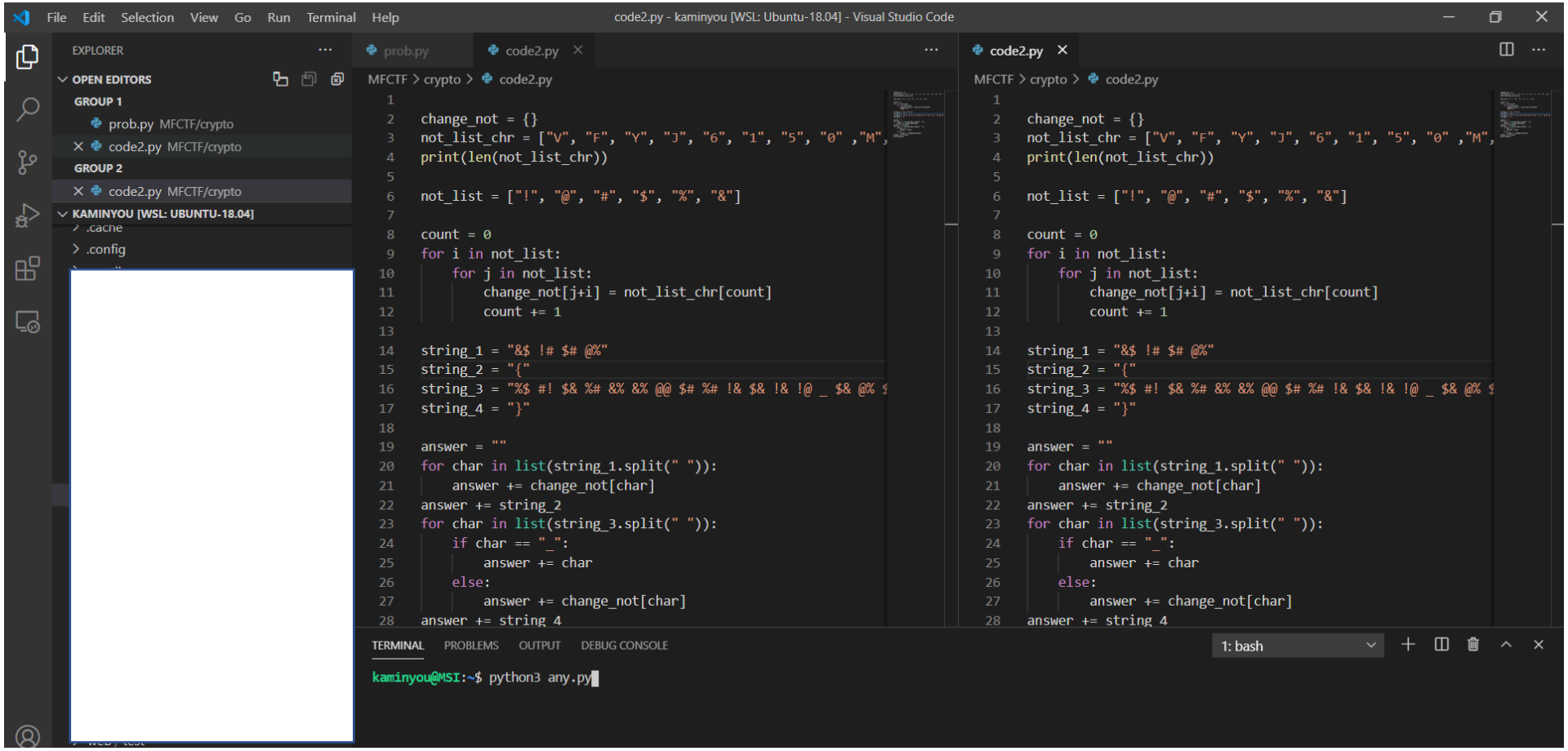


環境建置

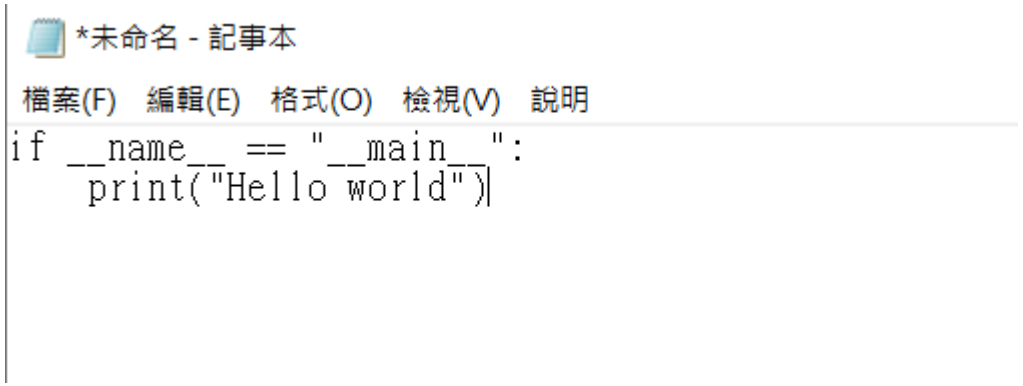
Visual Studio Code



環境建置
Visual Studio Code



環境建置
記事本




```
$ python3 helloworld.py
```

環境建置
Colab


GoogleDrive_Tutorial.ipynb
檔案 編輯 檢視畫面 插入 執行階段 工具 說明 系統不會儲存變更
共用
明洋
+ 程式碼 + 文字 複製到雲端硬碟
連線 編輯
Google Drive 檔案存取教學
作者：黃健祐 Chien-yu Huang
若有任何問題，歡迎來信至助教信箱 ntu-ml-2020spring-ta@googlegroups.com
Colab 可以透過兩種方式存取 Google Drive 的檔案：
1. 透過檔案共用連結
一般來說，Google Drive 的檔案連結會是類似下面的結構：
https://drive.google.com/open?id=1duQU7xqXRsOSPYeOR0zLiSA8g_LCFzoV
其中 "open?id=" 後面的那一串亂碼稱為 file_id
在 colab 中，我們可以直接用 file_id 下載檔案，優點是這個過程不需要再手動輸入任何訊息，但缺點是下載下來的檔案在程式執行完畢後就會消失，也就是每一次都必須重新下載，使得執行時間增加。
[ ] # 下載 file_id 為 "1duQU7xqXRsOSPYeOR0zLiSA8g_LCFzoV" 的檔案，並將它命名為 Minori.jpg
!gdown --id '1duQU7xqXRsOSPYeOR0zLiSA8g_LCFzoV' --output Minori.jpg
列出目前目錄下所有的檔案
!ls
Downloading...
From: https://drive.google.com/uc?id=1duQU7xqXRsOSPYeOR0zLiSA8g_LCFzoV
To: /content/Minori.jpg

環境建置
Note

Jupyter notebook -> .ipynb

Python -> .py

Part 3

Python programming I

Part 4

HW1

HW1

建好你的環境

請確保你可以進行
python programming

HW1

Hello bioinformatics

請寫一個程式，可以輸出以下結果

```
kaminyou@MSI:~/bioinformatiics$ python3 yourid_hw1.py
How many times: 5
Counts:1 || Hello bioinformatics!
Counts:2 || Hello bioinformatics!
Counts:3 || Hello bioinformatics!
Counts:4 || Hello bioinformatics!
Counts:5 || Hello bioinformatics!
```

```
kaminyou@MSI:~/bioinformatiics$ python3 yourid_hw1.py
How many times: 21
ERROR: MAX=20
```

```
kaminyou@MSI:~/bioinformatiics$ python3 yourid_hw1.py
How many times: -1
ERROR: negative value is not allowed
```

Thank you

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