使用 Python

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Agenda

- Python 基本元件
  - Variables, Booleans and None
  - String
  - If, else and elif
  - Lists and tuples
  - Loops
  - Dictionary
- Pyhon 套件介紹
  - Pandas
  - Matplotlib & Seabon

Python 基本元件

Variables, Booleans and None

- Assignment
  - `a = 1`
  - `b = c = 2`
  - `a, b, c = 1, 2.0, 'john'`
- Data type
  - `type(1) # <class 'int'>`
  - `type(2.0) # <class 'float'>`
  - `type(True) # <class 'bool'>`
  - `type('john')  #<class 'str'>`
  - `type(None) # <class 'NoneType'>`

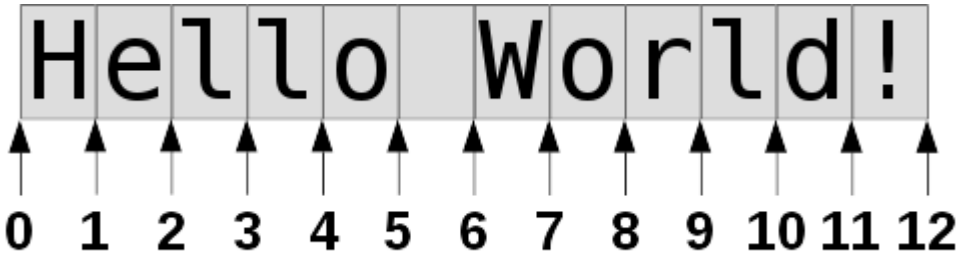
Operator

- Arithmetic operator
  - `+, -, *, /`
  - `% is mod`
  - `// is floor division`
  - `** is to the power of`
- Comparison operator
  - `==`
  - `!=`
  - `>`
  - `<`
  - `>=`
  - `<=`

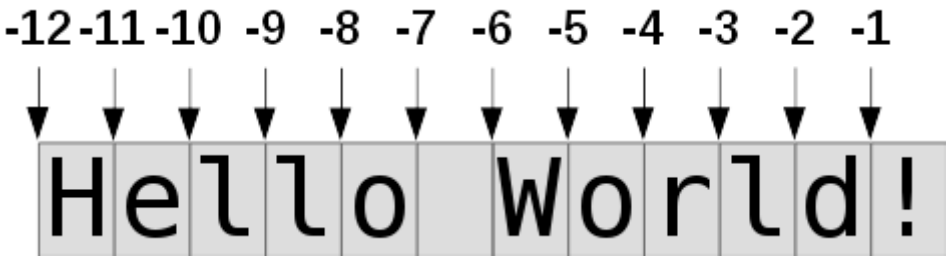
String

- a = 'Hello word! '

- Index and slicing
  - `a[0] # H`
  - `a[1:3] # ell`
  - `a[-1:-3] # ld!`



- Built-in function
  - `a.upper() # HELLO WORLD!`
  - `a.lower() # hello world!`



If, else and elif

```
b = 1
result = a - b

if result > 0:
    print("a is bigger than b")
elif result == 0:
    print("a is equal than b")
else:
    print("a is smaller than b")
```

Lists and tuples

- List
  - `names = ['wub_wub', 'theelous3', 'Nitori', 'RubyPinch']`
- Index and slicing
  - `names[0] # wub_wub`
  - `names[1:3] # ['theelous3', 'Nitori']`
- Check element
  - `'wub_wub' in names  # True`
  - `'Ruby' in names # False`
  - `['Alan','Bob'] in names # False, do not use like it`

Add and remove

- names.append("Alan")
  - `# ['wub_wub', 'theelous3', 'Nitori', 'RubyPinch', 'Alan']`
- names.remove("Alan")
  - `# ['wub_wub', 'theelous3', 'Nitori', 'RubyPinch']`

Tuples

- thing = (1, 2, 3) # (1,2,3)
- thing.append(4) # Error !!!
- Tuples is read-only lists

Loops

- For loops

```
sentences = ['Hi', ',', 'I', 'am', 'Alan']
```

```
for s in sentences:
    print(s)
```

```
Hi
,
I
am
Alan
```

For loops in string

```
for c in 'Hakuma matata':
    print(c)
```

```
H
a
k
u
m
a

m
a
t
a
t
a
```

Loops

- While loops

```
i = 0

while i < 10:
    print(i, "is too small")
    i += 1
print(i, "is big enough")
```

```
0 is too small
1 is too small
2 is too small
3 is too small
4 is too small
5 is too small
6 is too small
7 is too small
8 is too small
9 is too small
10 is big enough
```

Dictionary

- Key-Value structure

```
favorite_pets = {
    'Alan': 'cat',
    'Bob': 'dog',
    'Cindy': 'cat',
}
```

- favorite_pets['Alan'] # cat
- Add element
  - `favorite_pets['Denny'] = 'duck'`
- Remove element
  - `del favorite_pets['Alan']`

For loop in dictionary

- terate keys only

```
for n in favorite_pets:
    print(n, 'favorite pet is', favorite_pets[n])
```

```
Alan favorite pet is cat
Bob favorite pet is dog
Cindy favorite pet is cat
Denny favorite pet is duck
```

Pyhon 套件介紹

Pandas

- 提供較進階的資料處理
  - 自動匯入 CSV 檔
  - 內建方法的資料運算
  - 視覺化整合

```
"sepal.length","sepal.width","petal.length","petal.width","variety"
5.1,3.5,1.4,.2,"Setosa"
4.9,3,1.4,.2,"Setosa"
4.7,3.2,1.3,.2,"Setosa"
4.6,3.1,1.5,.2,"Setosa"
5,3.6,1.4,.2,"Setosa"
5.4,3.9,1.7,.4,"Setosa"
```

	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)
0	5.1	3.5	1.4	0.2
1	4.9	3.0	1.4	0.2
2	4.7	3.2	1.3	0.2
3	4.6	3.1	1.5	0.2
4	5.0	3.6	1.4	0.2


PANDAS LOVE DATA SCIENCE
imgflip.com

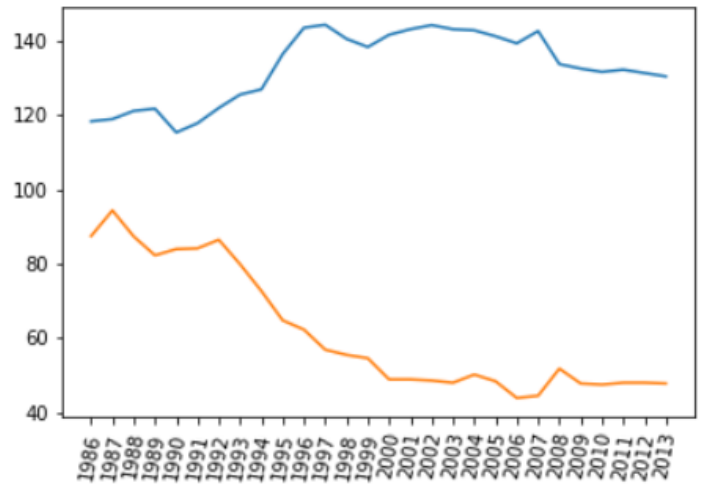
Matplotlib & Seabon

- 視覺化資料套件

```
print(death_year)
print(death_tumor)
print(death_heart)
```

```
[1986. 1987. 1988. 1989. 1990. 1991. 1992. 1993. 1994. 1995. 1996. 1997.
 1998. 1999. 2000. 2001. 2002. 2003. 2004. 2005. 2006. 2007. 2008. 2009.
 2010. 2011. 2012. 2013.]
[118.3 118.9 121.1 121.7 115.3 117.8 121.9 125.5 126.9 136.4 143.5 144.3
 140.5 138.3 141.6 143.1 144.2 143.1 142.8 141.2 139.3 142.6 133.7 132.5
 131.6 132.2 131.3 130.4]
[87.4 94.3 87.3 82.2 83.9 84.1 86.4 79.8 72.6 64.7 62.2 56.8 55.4 54.5
 48.8 48.8 48.5 47.9 50.1 48.3 43.8 44.4 51.7 47.7 47.4 47.9 47.9 47.7]
```

```
plt.plot(death_tumor)
plt.plot(death_heart)
plt.xticks(range(death_year.shape[0]), death_year.astype(np.int), rotation=80)
plt.show()
```



рахмат
danke
謝謝
ngiyabonga
Баярлалаа
mersi
kia ora
barka
welalin
tack
spas
teşekkür ederim
mahalo
tapadh leat
спасибо
faafetai lava
vinaka
спасибі
blagodaram
dank je
misaotra
matondo
paldies
grazzi
kiitos
dankie
thank you
gracias
хвала
asante
manana
nanni
nandri
dhanyavad
maururu
köszönöm
aciu
dankon
akun
obrigada
tenki
bedankt
bayarlalaa
gracie
hvala
enkosi
djiere dieuf
tau
mochchakkeram
murakoze
дякую
mamnun
chokrane
dziękuję
chnorakaloutioun
gratias ago
gràcies
sulpáy
taiku
go raibh maith agat
sobodi
dėkuji
sagolun
sukriya
kop khun krap
takk
arigatô
dakujem
trugarez
obrigado
mèsi
didi madloba
ありがとう
najis tuke
tanemirt
grazie
terima kasih
rahmet
kam sah hamnida
rahmat
diolch
dhanyavadagalu
shukriya
merce
мерси
তোমাকে ধন্যবাদ
감사합니다
xièxie
ευχαριστώ
merci