AI prep1

2019/05/21

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業務讀書會報告

本來想要報告AI

但是我發現如果對於程式要有一點基本的概念，
這樣知識才會連貫...

所以我打算先給大家一點基本的程式課

選用的程式

AI是資料科學的subset

常用的程式有Stata(統計軟體), R, Juila and Python

裡面Python最通用（就是可以用在很多非資料科學的地方，很好用）

因此我這邊就透過就給大家一點對於Python基本的觀念

Python

基本上還是要動手做，才會有感覺。

1. https://www.python.org/shell/
2. https://trinket.io/console

其實還有很多線上編輯器，這邊挑選兩個。

材料來源

一小時學Python

https://kopu.chat/2017/01/18/一小時python入門-part-1/

前言

其實程式這種東西，跟業務很像。
大家都好像可以做，但是要精通需要大量的訓練。

一個小時可能有點難，
但你真的可以幾個小時內學到大部分的程式語法，
但要精通活用，要長期的使用。

不過這邊，我也只是帶大家入門，
要活用，還是要看大家自己的興趣和需要。

PS：或許未來我也會繼續談程式，（因為程式本身，就是一種思考的訓練，也是很值得繼續講）

基本操作

assignment & data type

```
a = 123
type(a)

b = "456"
type(b)

c = 8.70
type(c)
```

當計算機

```
a = 13
b = 2
print a+b
print a-b
print a * b
print a / b
print a // b  # 無條件捨去除法
print a ** b  # a 的 b 次方
```

使用一些BIF內建函式

```
a = -3
b = 4
print (abs(a))
print (max(a,b))
print (min(a,b))
```

conti

```
c = 123
b = "456"
print(c +int(b));
print(str(c)+b);
```

input

```python
a = input()
print("a =",a)

b = input('What is your name: ')
print('Hello,',b)
```

請寫一支Python程式，能讀取兩個整數，並把他們的四則運算印出來

```
a = int(input("number 1= "))
b = int(input("number 2= "))
print(a+b)
print(a-b)
print(a*b)
print(a/b)
```

條件 condition

```python
battery = 50
if battery > 80:
    print("enough")
elif battery <30:
    print("not enough")
else:
    print("it's okay")
```

條件 condition conti

```python
phone = "samsung note 7"
battery = 5
if phone =="samsung note 7" and battery < 10:
    print("it's going to explosive")
elif phone != "samsung note 7" and battery <10:
    print("not note 7, it's okay")
elif not phone == "samsung note 7" or battery > 90:
    print("No note 7 or battery is full, you are fine")
else:
    print(" I don't know what happen")
```

Python整數機

- 第一步讓使用者輸入想要做的符號運算，比如「+, -, *, /」
- 第二步讓使用者輸入‘整數1’和 ‘整數2’，最後讓這兩個整數進行運算。
- 如果輸入的運算符號不是「+, -, *, /」，便輸出「錯誤」。

```
x = input("operator: ")
a = int(input("num1: "))
b = int(input("num2: "))


if x == ('+'):
    print a + b
elif x == ('-'):
    print a - b
elif x == ('*'):
    print a * b
elif x == ('/'):
    print a / b
else:
    print("error")
```

Loop 迴圈

```
for i in range(0,10):
    print i
```

Loop conti

```
for i in range(1,10):
    for j in range(1,10):
        print(i*j)
```

Loop conti-2

```
for i in range(1,10,2):
    print i

for j in range(10,1,-3):
    print j
```

猜數字

每次讓使用者猜一個整數，若猜對就輸出Bingo
使用者最多可以猜3次。
(提示: Bingo後可以使用break來離開迴圈)

```python
answer = 20

for i in range(0,3):
    guess = int(input("Please guess a number between 1-30"))
    if answer == guess:
        print("Bingo!")
        break
    else:
        print("guess again")
print("game over")
```

更多例子, loop and list

```
# create a list
a = ["Ben", 0.87, 1234, True]

for i in a:
    print(i)

for i in range(len(a)):
    print (a[i])
```

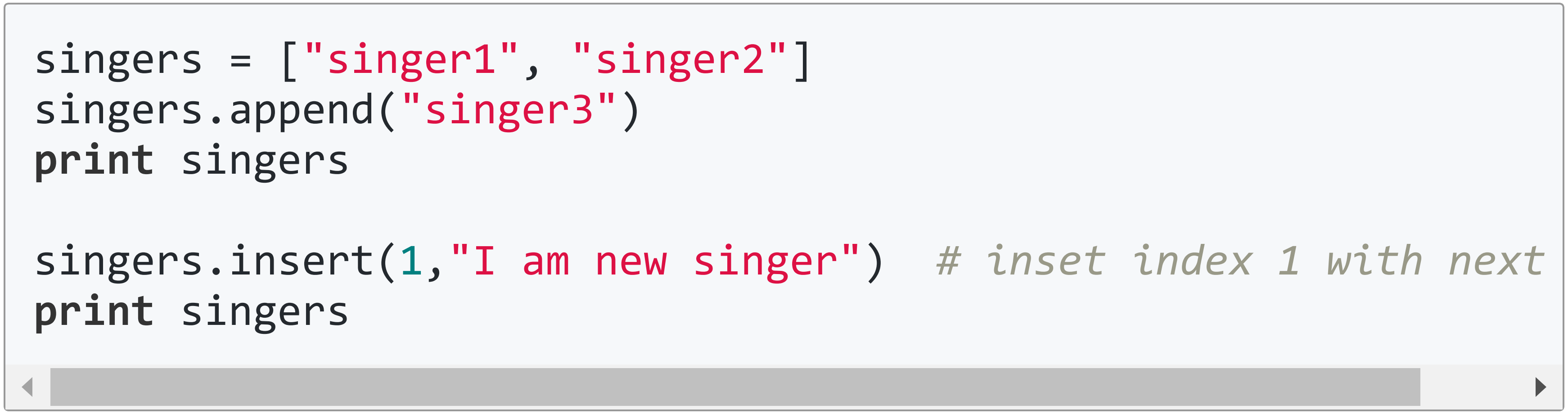
LIST 列表/Array

很重要的資料結構概念..之一

前面有說過的，數字和字串

```
a = [1,3,5,7,9]

for i in range(len(a)):
    a[i] = a[i]*a[i]
print(a)
```

List的操作1



```
singers = ["singer1", "singer2"]
singers.append("singer3")
print singers

singers.insert(1,"I am new singer")  # inset index 1 with next
print singers
```

List的操作2

```python
singers.pop()  # remove last one
print singers

singers.pop(2) # remove index 2
print singers

singers.remove("I am new singer");
print singers

singers.append("new guy")
print singers

singers[:]=[]  # clear the list via slice method
print singers
```

List運用

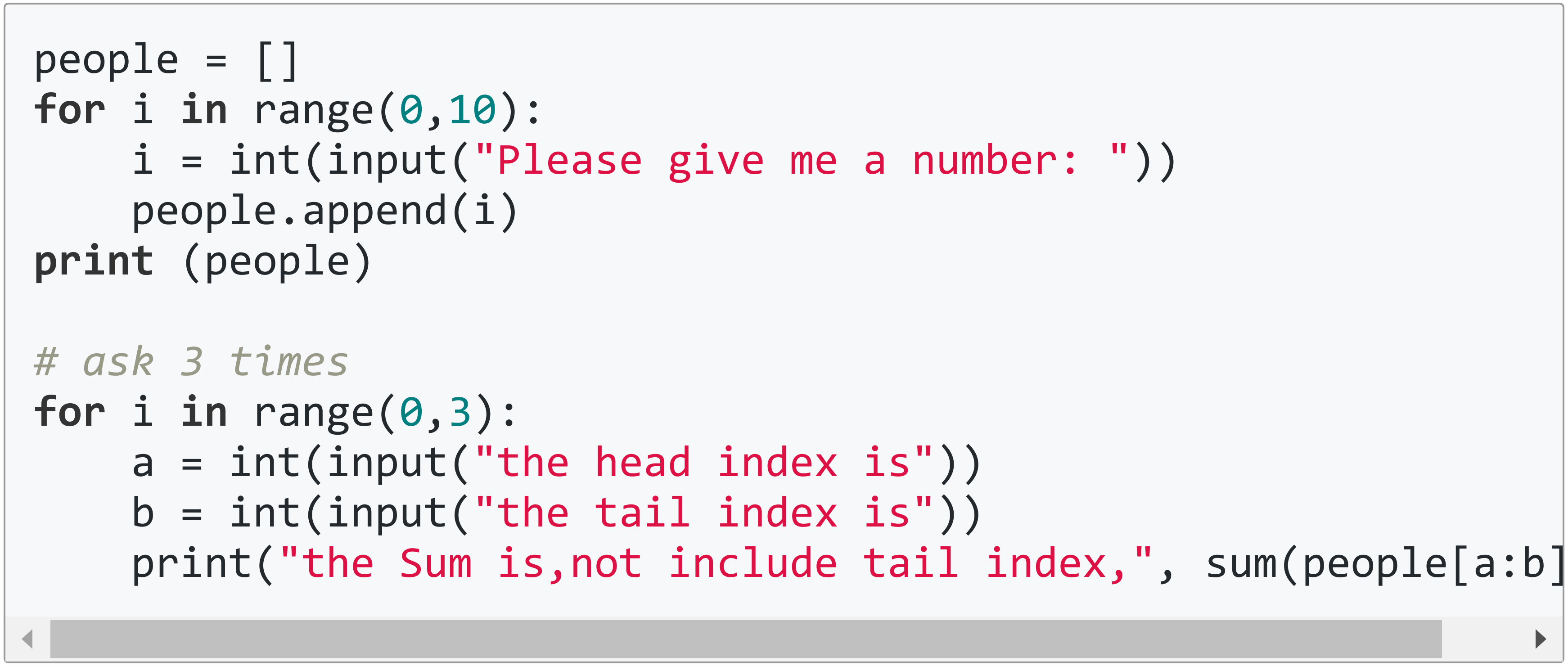
```python
# have a list containing math grade
math_grade = [88,94,70,99,89]

# cal the avg
avg = sum(math_grade) / len(math_grade)
print(f"原本平均:{avg}")



for i in range(len(math_grade)):
    math_grade[i] = math_grade[i]**0.5*10


New_avg = sum(math_grade) / len(math_grade)
print(f"新的平均:{New_avg}")
```

List slicing

```
greeting = ["apple","hello","hey","yo","Aloha"]
print(greeting[0:2])
print(greeting[1:4])
print(greeting[:])
print(greeting[2:])
print(greeting[:4])
```

辦個party吧

要求輸入十個整數
存入一個名為people的清單中 (表示我們的宴客人數)；
然後可以輸入index開始和結束的位置，算出加總



```
people = []
for i in range(0,10):
    i = int(input("Please give me a number: "))
    people.append(i)
print (people)

# ask 3 times
for i in range(0,3):
    a = int(input("the head index is"))
    b = int(input("the tail index is"))
    print("the Sum is,not include tail index,", sum(people[a:b]
```

資料結構：物件1

```
# 建立一個物件
d = {123:"Ben Hu",
     "cat":["Boony","Kitty"],
     "isGoodDay":True}

print d
print len(d)
```

資料結構：物件2

```
# access
print(d[123])
print(d["cat"])

# delete
del d[123]
print d

#assignment
d[456]="Ben is back"
print d
```

loop over Object

```
table = {}
for i in range(0,5):
    k = raw_input("input string please")
    v = int(raw_input("input number please"))
    table[k]=v
print(table)
```

Object input

```
table = {}

k = input("input Key")
v = int(input("input Value"))
table[k]=v

print(table)
```

find key in object

```
d = {"one":1,
     "two":2,
     "three":3,
     "four":4,
     "five":5}

target = 2

for key in d:
    if d[key] == target:
        print (f"I found it, the key is {key}")
        break
    else:
        print("keep checking")
```

Boolean check in object

```
d = {"one":1, "two":2, "three":3, "four":4, "five":5}
print("one" in d)
print( 1 in d)
```

only access key or value

```
d = {"one":1,"two":2,"three":3,"four":4,"five":5}
print( 0 in d.keys())
print( 1 in d.values())
print( "one" in d.keys())
print( 9 in d.values())
```

use Objet.get

```
d = {"one":1,"two":2,"three":3,"four":4,"five":5}
print(d["one"])
print(d.get("two", "no found"))
print(d.get(2, "no found"))
```

# 一年一度的世界歌王大賽

身為評審，請輸入五位歌手的名字與成績。
接下來會有五次查詢的機會，
每次查詢都可以輸入名字來查看分數。
如果歌手不在名單中，會說明沒有此歌手。

```python
competition = {}
for judge in range(0,3):
    name = input("please enter singer's name:")
    grade = int(input("please enter the score: "))
    competition[name] = grade
print(competition)
print(" ")

for audience in range(0,2):
    query = input("please enter singer's name for socre: ")
    print(competition.get(query,"no this singer"))
```