



程式設計概論

Programming 101

—其他資料型態 (tuple, set)

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Outline

- Python資料結構

- Sequence

- List

- **tuple**

- Non-sequence

- dictionary

- **set**

sequence(序列)

- The value i
- operators
 - The + and * operator
 - Subscript indexing for retrieving element values
 - The >, <, >=, <=, ==, != operator
 - The in and not in operator
 - Slicing expressions: `variable_name[start:end:step]`

Tuple(序對)



Tuple

- A tuple is an immutable sequence, which means that it cannot be changed
- A tuple is a sequence, very much like a list.
- Once a tuple is created, it cannot be changed
- You enclose its elements in a set of parentheses() to create a tuple.
- `tuple2=(1,2,3)`
- `tuple3=tuple(range(5))`

Tuple operation

- Notice: tuple cannot be changed : `T[0]=100`  error
- + operator (連接運算子)
 - `(1,2,3)+("Taipei","Tokyo","Vienna")`
- * operator (重複運算子)
 - `3*(1,3,6)`
- >, <, >=, <=, ==, != operators
 - `(1,"Python","R") == ("Python","R",1) #False`
 - `(1,2,3) < (1,2,3,4) # True`
- in 和 not in operator
 - `"Taipei" in (1, "Taipei", 2, "Tokyo") # True`
- Indexing and slicing: `tuple_name[start:end:step]`

Tuple operation(cont.)

Indexing and slicing

T=(5,10,15,20, 25, 30, 35, 40)

T[0] # 索引第一個元素

T[2 : 5] # 索引2到4的元素(不含索引5)

T[-1] # 索引最後一個元素

T[6 : -1] # 索引6到-2的元素(不含索引-1)

set(集合)

SET

- A set contains a collection of unique value and work like a mathematical set.
- A set cannot contain duplicate elements.
- Sets are unordered.
 - No support +, *, [index], [start:end]... {集合沒有連接運算子(+)、重複運算子(*)、索引運算子([])、片段運算子([start:end])或其他與順序有關的運算}
- Create an empty set: `set1=set()`
- `set2={"Taipei","NY"}`
- `set3=set([1,2,3,3,2,2])`
- `set4=set(range(5))`

SET: >, <, >=, <=, ==, !=

```
S1={'Python','Java','matlab'}
```

```
S2={'Python','Java','matlab','R'}
```

```
S3={'Python','matlab','Java'}
```

```
print(S1==S3) #True
```

```
print(S1 != S2) #True
```

```
print(S1<= S2) # True (S1 is a subset of S2)
```

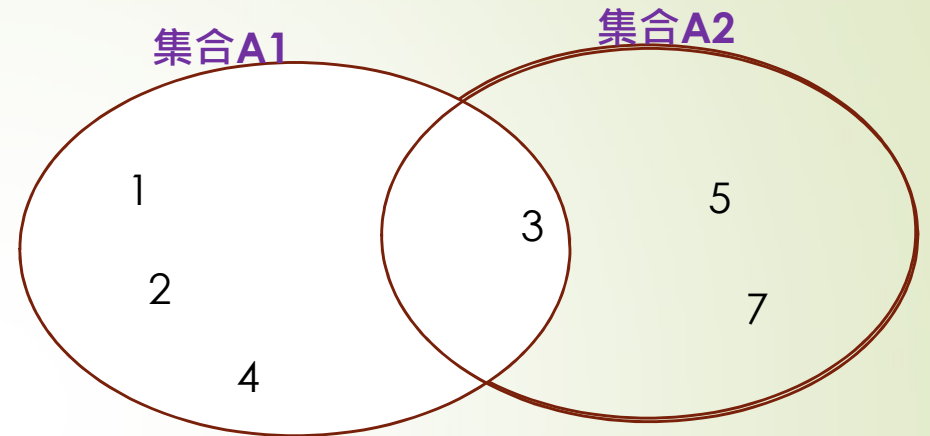
```
print(S1< S2)
```

The method (function) in set

- `S1={10, 20, 30, 40, 50}`
- `S1.add(60)`
- `S1.remove(30)`
- `S1.pop()`
- `S2=S1.copy()`
- `S1.clear()`

The operations of any two sets

- Union: 聯集 (|)
- Intersection: 交集 (&)
- Difference set: 差集 (-)
- Mutually exclusive 互斥 (^)



```
A1=set('1234')
A2=set('357')
print(A1 | A2)
print(A1 & A2)
print(A1-A2) # A2-A1=?
print(A1^A2)
```

Student exercise_7

Question 1

- 請使用者輸入兩段文字，程式會找出兩段文字的共同字。

Question 2

- 請撰寫一個Python程式，利用內建函式sorted傳入欲排序的串列，並以參數key指定以何物為排序依據，串列為
`list1=[['apple',25],['orange',10],['fig',12],['lemon',20]]`，
請定義三個函式為排序的依據，分別是:依據水果名的字母順序、依據水果名稱的長度、依據水果的價格。