

1.5 List 運用

你將學習到

1. List 是什麼
2. 取出指定元素
3. 變更指定元素
4. 取出元素範圍
5. 元素個數 `len()`
6. 元素存在測試 `in`
7. 新增元素 `.append()` `.insert()`
8. 移除元素 `del` `.remove()`
9. 搜尋元素 `.index()`

List 是什麼？

List 可用於用單一變數儲存多個數值，這樣我們就無需定義大量變數。通常這些數值都是相關的，例如以下是某個股票的股價變化：

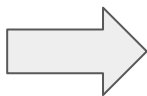
```
price0 = 10.0
```

```
price1 = 10.2
```

```
price2 = 10.3
```

```
price3 = 9.8
```

```
price4 = 9.7
```



```
price = [10.0, 10.2, 10.3, 9.8, 9.7]
```

List 是什麼？

List 可儲存不同型別的數值。

```
numList = [1, 2, 5, 9, 12]           # 整數 list
stringList = ["apple", "orange", "kiwi"] # 字串 list
mixList = ["apple", 8, [1, 2, 3]]      # 混合 list
emptyList = []                        # 空 list
```

取出指定元素 by index

0 1 2
["apple", "orange", "kiwi"]
-3 -2 -1

["apple", "orange", "kiwi"][0]	# "apple"
["apple", "orange", "kiwi"][1]	# "orange"
["apple", "orange", "kiwi"][2]	# "kiwi"
["apple", "orange", "kiwi"][-1]	# "kiwi"
["apple", "orange", "kiwi"][-2]	# "orange"
["apple", "orange", "kiwi"][-3]	# "apple"

取出指定元素 by index

```
fruits = ["apple", "orange", "kiwi"]
```

```
fruits[0]          # "apple"
```

```
fruits[1]          # "orange"
```

```
fruits[2]          # "kiwi"
```

```
fruits[-1]         # "kiwi"
```

```
fruits[-2]         # "orange"
```

```
fruits[-3]         # "apple"
```

我們也可以先把 List 儲存到變數，這樣寫就更方便。

取出元素範圍 by range

0 1 2 3 4
fruits = ["apple", "orange", "kiwi", "grape", "pear"]
-5 -4 -3 -2 -1

list[start: stop: step]

start 預設為 0, stop 預設為最尾、step 預設為 1

```
fruits[ : ]      # ["apple", "orange", "kiwi", "grape", "pear"]  
fruits[ : 3]     # ["apple", "orange", "kiwi"]  
fruits[ : : 2]   # ["apple", "kiwi", "pear"]  
fruits[2: 4]     # ["kiwi", "grape"]
```

變更指定元素

當我們想變更 list 內的某一個元素，可以用以下方法：

```
fruits = ["apple", "orange", "kiwi"]
```

```
fruits[1] = "grape"          # 把元素 "orange" 變為 "grape"
```

```
# fruits = ["apple", "grape", "kiwi"]
```


List 加法

```
["apple", "orange", "kiwi"] + ["grape", "strawberry"]
```

```
# ["apple", "orange", "kiwi", "grape", "strawberry"]
```

List 乘法

```
["apple", "orange"] * 2
```

```
# ["apple", "orange", "apple", "orange"]
```

取得元素數目 len()

```
fruits = ["apple", "orange", "pear"]
```

```
len(fruits)
```

```
# 3
```

測試元素是否存在 in

```
fruits = ["apple", "orange", "pear"]
```

```
"orange" in fruits          # 返回 True
```

```
"grape" in fruits          # 返回 False
```

新增元素到末端 .append()

```
fruits = ["apple", "orange"]
```

```
fruits.append("pear")
```

```
# fruits = ["apple", "orange", "pear"]
```

按位置移除元素 del

```
fruits = ["apple", "orange", "grape", "kiwi"]
```

```
del fruits[ -1 ]           # 移除最後面元素  
# fruits = ["apple", "orange", "grape"]
```

```
del fruits[ 0 ]           # 移除元素 0  
# fruits = ["orange", "grape"]
```

```
del fruits[ 1 ]           # 移除元素 1  
# fruits = ["orange"]
```

按位置移除元素 del

```
fruits = ["apple", "orange", "grape", "kiwi"]
```

```
del fruits[ 1 : 3 ]          # 移除元素1, 2
```

```
# fruits = ["apple", "kiwi"]
```

```
del fruits[ : ]             # 移除所有元素
```

```
# fruits = []
```

新增元素到任何位置 .insert()

額外資料

```
fruits = ["orange", "kiwi"]
```

```
fruits.insert(1, "grape")           # 新增元素到位置 index 1
```

```
# fruits = ["orange", "grape", "kiwi"]
```

```
fruits.insert(0, "apple")           # 新增元素到位置 index 0 (開頭)
```

```
# fruits = ["apple", "orange", "grape", "kiwi"]
```

```
fruits.insert(4, "pear")             # 新增元素到位置 index 4 (最後)
```

```
# fruits = ["apple", "orange", "grape", "kiwi", "pear"]
```

```
# 以上例子可改用 fruits.insert(len(fruits), "pear") 動態取得結尾 index 會更好
```


搜尋元素位置 .index()

```
fruits = ["apple", "orange", "kiwi", "grape", "pear"]
```

```
fruits.index("kiwi")      # 返回 2
```

按數值移除元素 .remove()

```
fruits = ["apple", "orange", "kiwi"]
```

```
fruits.remove("orange")
```

```
# fruits = ["apple", "kiwi"]
```

練習

1. 定義變數 a 賦值為 ["apple", "orange", "kiwi"]
2. 把 "orange" 變為 "grape"
3. 在後面加入新元素 "pear"
4. 移除元素 "apple"
5. 經過以上步驟, 變數 a 數值現應為
["grape", "kiwi", "pear"], 嘗試從 a 直接取得
"pear" 的最後3個字母 "ear"

答案

1. `a = ["apple", "orange", "kiwi"]`
2. `a[1] = "grape"`
3. `a.append("pear")`
4. `del a[0]`
5. `a[2][1:]`

學習回顧

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