



程式設計概論

Programming 101

—其他資料型態

dictionaries (dict)

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Outline

- Python資料結構
 - Sequence
 - List
 - tuple
 - Non-sequence
 - dictionary
 - set
- dictionary

dictionary

- A dictionary is an object that stores a collection of data.
- Each element in a dictionary has two parts: a key and a value (key-value pairs).
- You use a key to locate a specific value.
 - Retrieve a value from a dictionary → **`dict_name[key]`**
- Key-value pairs are often referred to as *mappings* because each key is mapped to a value.
- Create a dictionary by enclosing the elements inside a set of curly braces {}.
- Example: `phonebook={'Chris':'555-1111','Katie':'555-2222','Joanne':'555-3333'}`

dictionary (cont.)

- 4 ➤ The values in a dictionary can be objects (任何資料型態)
- The keys must be immutable objects, keys can be strings, integers, floating-point values, or tuples. Keys cannot be lists or any other type of immutable object.
- Cannot have duplicate keys in a dictionary. (「鍵」是唯一的)
 - When you assign a value to an existing key, the new value replaces the existing value.
- Create an empty dictionary: `dict_1=dict()` or `dict_1={}`

```
E=dict()
E1={}
EA={"one":1,"two":2,"three":3}
EB=dict({"three":3,"two":2,"one":1})
EC=dict(one=1,two=2,three=3)
ED=dict([("two",2),("one",1),("three",3)])
print(ED)
```

dictionary operator

- dict(字典): non-sequence
- dict: **does not work**(不支援)+, *, indexing, slicing and related order operation
- dict: in and not in operator for check key
- dict: == and !=

dict: add, delete, modify

Add or modify:
`dict_name[key]=value`

Delete
`del dict_name[key]`

```
pwd={'Justin':10912398, 'John':10812890}
print(pwd['Justin'])
pwd['Helen']=10897281 #add key_value
pwd['Helen']=10897310 # modify value
print(pwd)
del pwd['John'] # del key為John的key_value
print(pwd)
print(pwd.items())
print(pwd.keys())
print(pwd.values())
print(pwd.get('Helen'))
```

dict: add, delete, modify (cont.)

D1==D2 → D1 and D2 the same key-value pairs, returning **True**

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

```
len(EA)
```

#使用for迴圈走訪dict中所有的鍵:值對

```
for key in EA:
```

```
    print("鍵為",key,"所對映的值為",EA[key])
```

```
EA.get("one") #傳回鍵為"one"所對映的值
```

```
EA.pop("three") #刪除鍵為"three"的鍵:值並傳回值
```

```
EA.popitem() #刪除最後一個鍵:值並傳回該鍵:值對
```

dictionary functions in this class

```
len(dict_name)  
dict_name.copy()  
dict_name.get(key): get its value  
dict_name.items(): get(key,value)  
key in dict_name: get True/False  
dict_name.keys(): get all keys in dict_name  
dict_name.values(): get all value in dict_name  
dict_name.update(dict_new)
```

Discussion with team
members for this exercise

Question 1: Word Frequency

- ▶ Write a program that assigns one text as a string variable. The program should create a dictionary in which the keys are the individual words found in the file and the values are the number of times each word appears.
 - ▶ For example, if the word “the” appears 128 times, the dictionary would contain an element with ‘the’ as the key and 128 as the value.
- ▶ The text is the song “What Makes You Beautiful” (hint: `str1.split()`)

Question 1: Word Frequency (cont.)

- Then, find words with the maximum and minimum times
- Print:
 - A. The dictionary
 - B. Appear words of the max. and min. times

Question 2: Capital Quiz

- ▶ p418 in textbook
- ▶ Create a dictionary from colab_file
(<https://colab.research.google.com/drive/1Nf4uci-r8izOBzn3HcdNYw8wv8hpZaiU>)

Review

Textbook 10.1