INDUSTRIAL TRAINING DAILY DIARY
DAY 5

30 June, 2025

Topic : Dictionaries in Python

Python dictionary is a data structure that stores the value in **key: value** pairs. Values in a dictionary can be of any data type and can be duplicated, whereas keys can't be repeated and must be **immutable**.

Example: Here, The data is stored in **key:value** pairs in dictionaries, which makes it easier to find values**.**

```
# 1. Write a Python script to add a key to a dictionary.
# Sample Dictionary: {0: 10, 1: 20}
# Expected Result: {0: 10, 1: 20, 2: 30}

dict = {0: 10, 1: 20}
dict[2] = 30
dict
```

```
{0: 10, 1: 20, 2: 30}
```

How to Create a Dictionary

Dictionary can be created by placing a sequence of elements within curly {} braces, separated by a 'comma'.
Dictionary keys are case sensitive: the same name but different cases of Key will be treated distinctly.
•**Keys must be immutable:** This means keys can be strings, numbers or tuples but not lists.

•**Keys must be unique:** Duplicate keys are not allowed and any duplicate key will overwrite the previous value.

•Dictionary internally uses **Hashing**. Hence, operations like search, insert, delete can be performed in **Constant Time**.

Accessing Dictionary Items

We can access a value from a dictionary by using the **key** within square brackets or **get()** method.

```python
d = { "name": "Prajjwal", 1: "Python", (1, 2): [1,2,4] }

# Access using key
print(d["name"])

# Access using get()
print(d.get("name"))
```

Output

```
Prajjwal
Prajjwal
```

Adding and Updating Dictionary Items

We can add new key-value pairs or update existing keys by using assignment.

Removing Dictionary Items

We can remove items from dictionary using the following methods:

- **del**: Removes an item by key.
- **pop():** Removes an item by key and returns its value.
- **clear():** Empties the dictionary.
- **popitem():** Removes and returns the last key-value pair.

Programs Covered :

```python
# 2. Write a Python program, to sum up, all the items in a dictionary.
# di = {'Cierra Vega': 175, 'Alden Cantrell': 180, 'Kierra Gentry': 165, 'Pierre Cox': 190,'Theodore': 19, 'Roxanne': 20, 'Mathew': 21, 'Betty': 20}
dict = {'Cierra Vega': 175, 'Alden Cantrell': 180, 'Kierra Gentry': 165, 'Pierre Cox': 190,'Theodore': 19, 'Roxanne': 20, 'Mathew': 21, 'Betty': 20}
sum = 0
for i in dict:
    sum = sum + dict[i]
sum
```

```
790
```

```python
# 3. Write a Python program to get the maximum and minimum values in a dictionary.
# di = {'Cierra Vega': 175, 'Alden Cantrell': 180, 'Kierra Gentry': 165, 'Pierre Cox': 190,'Theodore': 19, 'Roxanne': 20, 'Mathew': 21, 'Betty': 20}

dict = {'Cierra Vega': 175, 'Alden Cantrell': 180, 'Kierra Gentry': 165, 'Pierre Cox': 190,'Theodore': 19, 'Roxanne': 20, 'Mathew': 21, 'Betty': 20}
max = dict['Cierra Vega']
min = dict['Cierra Vega']
for i in dict:
    if dict[i] > max :
        max = dict[i]
    if dict[i] < max:
        min = dict[i]

print(max,min)
```

```
190 20
```

```
# 4. Write a Python script to generate and print a dictionary that contains a number (between 1 and n) in the form (x, x*x)
# Sample Dictionary ( n = 5) :
# Expected Output: {1: 1, 2: 4, 3: 9, 4: 16, 5: 25}

n = 5
dic = {}
for i in range(1,n+1):
    dic[i] = i*i
dic
```

```
{1: 1, 2: 4, 3: 9, 4: 16, 5: 25}
```

```
# 5. Write a Python program to combine two dictionary adding values for common keys.
# d1 = {'a': 100, 'b': 200, 'c':300}
# d2 = {'a': 300, 'b': 200, 'd':400}
# Sample output: {'a': 400, 'b': 400, 'd': 400, 'c': 300}

d1 = {'a': 100, 'b': 200, 'c':300}
d2 = {'a': 300, 'b': 200, 'd':400}
d = {}
for i in d1 :
    for j in d2:
        if i==j :
            d[i] = d1[i]+d2[j]
        else :
            d[j]= d2[j]
            d[i]=d1[i]
d
```

```
{'a': 300, 'b': 200, 'd': 400, 'c': 300}
```

```
# 6. Write a Python program to combine two lists into a dictionary, where the elements of the first one serve as the keys
#and the elements of the second one serve as the values. The values of the first list need to be unique and hashable.
# Sample Output:
# Original lists:
# ['a', 'b', 'c', 'd', 'e', 'f']
# [1, 2, 3, 4, 5]
# Combine the values of the said two lists into a dictionary:
# {'a': 1, 'b': 2, 'c': 3, 'd': 4, 'e': 5}

l1=['a', 'b', 'c', 'd', 'e', 'f']
l2=[1, 2, 3, 4, 5]
d = {}

for i in l1:
    for j in l2:
        d[i] = j
d
```

```
{'a': 5, 'b': 5, 'c': 5, 'd': 5, 'e': 5, 'f': 5}
```

```
# 7. Write a Python program to combine two or more dictionaries, creating a list of values for each key.
# Sample Output:
# Original dictionaries:
# {'w': 50, 'x': 100, 'y': 'Green', 'z': 400}
# {'x': 300, 'y': 'Red', 'z': 600}
# Combined dictionaries, creating a list of values for each key:
# {'w': [50], 'x': [100, 300], 'y': ['Green', 'Red'], 'z': [400, 600]}

d1 = {'w': 50, 'x': 100, 'y': 'Green', 'z': 400}
d2 = {'x': 300, 'y': 'Red', 'z': 600}
d = {}

for i in d1:
    l = []
    if i in d2 and i not in d :
        l.append(d1[i])
        l.append(d2[i])
    else:
        l.append(d1[i])
    d[i] = l
print(d)
```

```
{'w': [50], 'x': [100, 300], 'y': ['Green', 'Red'], 'z': [400, 600]}
```

```
## 8.  Write a Python program to find the shortest list of values with the keys in a given dictionary.

# Original Dictionary: {'V': [10, 12], 'VI': [10], 'VII': [10, 20, 30, 40], 'VIII': [20], 'IX': [10, 30, 50, 70], 'X': [80]}
#Shortest list of values with the keys of the said dictionary: ['VI', 'VIII', 'X']

dict =  {'V': [10, 12], 'VI': [10], 'VII': [10, 20, 30, 40], 'VIII': [20], 'IX': [10, 30, 50, 70], 'X': [80]}
list = []
mi = 'V'

for i in dict :
    if len(dict[i])<=len(dict[mi])  :
        mi = i


for i in dict :
    if len(dict[i]) == len(dict[mi]):
        list.append(i)
list
```

```
['VI', 'VIII', 'X']
```

```
# 9. Write a Python program to count the frequency in a given dictionary.

# Original Dictionary:
# {'V': 10, 'VI': 10, 'VII': 40, 'VIII': 20, 'IX': 70, 'X': 80, 'XI': 40, 'XII': 20}
# Count the frequency of the said dictionary:
# Counter({10: 2, 40: 2, 20: 2, 70: 1, 80: 1})

dict = {'V': 10, 'VI': 10, 'VII': 40, 'VIII': 20, 'IX': 70, 'X': 80, 'XI': 40, 'XII': 20}
d = {}
for i in dict :
    count = 0
    for j in dict:
        if dict[i] == dict[j]:
            count+=1
    d[dict[i]] = count
print(d)
```

```
{10: 2, 40: 2, 20: 2, 70: 1, 80: 1}
```

```
# 10. Write a Python program to create a dictionary from a string.
# Note: Track the count of the letters from the string.
# Sample string: 'w3resource'
# Expected output: {'w': 1, '3': 1, 'r': 2, 'e': 2, 's': 1, 'o': 1, 'u': 1, 'c': 1}

string = 'w3resource'
d = {}
for i in string :
    count = 0
    for j in string:
        if i == j :
            count+=1
    d[i] = count
print(d)
```

```
{'w': 1, '3': 1, 'r': 2, 'e': 2, 's': 1, 'o': 1, 'u': 1, 'c': 1}
```

```python
# 11. Write a Python program to convert a dictionary into a list of lists.
# Original Dictionary:
# {1: 'red', 2: 'green', 3: 'black', 4: 'white', 5: 'black'}
# Convert the said dictionary into a list of lists:
# [[1, 'red'], [2, 'green'], [3, 'black'], [4, 'white'], [5, 'black']]
# Original Dictionary:
# {'1': 'Austin Little', '2': 'Natasha Howard', '3': 'Alfred Mullins', '4': 'Jamie Rowe'}
# Convert the said dictionary into a list of lists:
# [['1', 'Austin Little'], ['2', 'Natasha Howard'], ['3', 'Alfred Mullins'], ['4', 'Jamie Rowe']]
# Original Dictionary:
# [{'Math': 90, 'Science': 92}, {'Math': 89, 'Science': 94}, {'Math': 92, 'Science': 88}]

d = {1: 'red', 2: 'green', 3: 'black', 4: 'white', 5: 'black'}
l = []
for i in d :
    t = []
    t.append(i)
    t.append(d[i])
    l.append(t)
print(l)
```

```
[[1, 'red'], [2, 'green'], [3, 'black'], [4, 'white'], [5, 'black']]
```

```python
# 12. Original Dictionary:
# [{'Math': 90, 'Science': 92}, {'Math': 89, 'Science': 94}, {'Math': 92, 'Science': 88}]
# Extract a list of values from said list of dictionaries where subject = Math
# [90, 89, 92]

ls = [{'Math': 90, 'Science': 92}, {'Math': 89, 'Science': 94}, {'Math': 92, 'Science': 88}]
sbj = 'Math'
l = []
for i in ls :
    for j in i:
        if j == sbj :
            l.append(i[j])
l
```

```
[90, 89, 92]
```

```python
# 13. Write a Python program to check all values are the same in a dictionary.
# Original Dictionary:
# {'Cierra Vega': 12, 'Alden Cantrell': 12, 'Kierra Gentry': 12, 'Pierre Cox': 12}
# Check all are 12 in the dictionary.
# True
# Check all are 10 in the dictionary.
# False

d = {'Cierra Vega': 12, 'Alden Cantrell': 12, 'Kierra Gentry': 12, 'Pierre Cox': 12}
check = 12
flag = 1
for i in d :
    if d[i]!=check:
        flag = 0
        break
if flag == 0:
    print("False")
elif flag == 1:
    print(True)
```

```
True
```

```
#   ******(is there any other way of doing this? like using nested loops)
# 14. Write a Python script to concatenate following dictionaries to create a new one.
# Sample Dictionary :
# dic1={1:10, 2:20}
# dic2={3:30, 4:40}
# dic3={5:50,6:60}
# Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}

dic1={1:10, 2:20}
dic2={3:30, 4:40}
dic3={5:50,6:60}
dic = {}
for i in dic1:
    dic[i] = dic1[i]
for i in dic2:
    dic[i] = dic2[i]
for i in dic3:
    dic[i] = dic3[i]
print(dic)
```

```
{1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}
```

```
## 15. Write a Python program to create a dictionary of keys x, y, and z where each key
#has as value a list from 11-20, 21-30, and 31-40 respectively.

# output:
# {'x': [11, 12, 13, 14, 15, 16, 17, 18, 19],
# 'y': [21, 22, 23, 24, 25, 26, 27, 28, 29],
# 'z': [31, 32, 33, 34, 35, 36, 37, 38, 39]}

dic = {}
l1 = []
l2 = []
l3 = []
for i in range(11,40):
    if i>=11 and i<20 :
        l1.append(i)
    elif i>=21 and i<30:
        l2.append(i)
    elif i>=31 and  i<40:
        l3.append(i)
dic['x'] = l1
dic['y'] = l2
dic['z'] = l3

dic
```

```
{'x': [11, 12, 13, 14, 15, 16, 17, 18, 19],
 'y': [21, 22, 23, 24, 25, 26, 27, 28, 29],
 'z': [31, 32, 33, 34, 35, 36, 37, 38, 39]}
```

```python
# 16. Access the fifth value of each key from the dictionary.

# 15
# 25
# 35
# x has value [11, 12, 13, 14, 15, 16, 17, 18, 19]
# y has value [21, 22, 23, 24, 25, 26, 27, 28, 29]
# z has value [31, 32, 33, 34, 35, 36, 37, 38, 39]


dic = {'x': [11, 12, 13, 14, 15, 16, 17, 18, 19],
 'y': [21, 22, 23, 24, 25, 26, 27, 28, 29],
 'z': [31, 32, 33, 34, 35, 36, 37, 38, 39]}

for i in dic :
    print(dic[i][4])
```

```
15
25
35
```

```python
# 17. Write a Python program to filter a dictionary based on values.
# Original Dictionary:
# {'Cierra Vega': 175, 'Alden Cantrell': 180, 'Kierra Gentry': 165, 'Pierre Cox': 190}
# Marks greater than 170:
# {'Cierra Vega': 175, 'Alden Cantrell': 180, 'Pierre Cox': 190}

dic = {'Cierra Vega': 175, 'Alden Cantrell': 180, 'Kierra Gentry': 165, 'Pierre Cox': 190}
d = {}
for i in dic:
    if dic[i]>170 :
        d[i]=dic[i]
d
```

```
{'Cierra Vega': 175, 'Alden Cantrell': 180, 'Pierre Cox': 190}
```