Module 04d. Data Structures (Dictionary)

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1 Dictionaries

1.0.1 Creating a dictionary and accessing values

```
In [9]: d = {'Name': 'Jia', 'Age': 25, 'City': 'Mumbai', 'marks': [70,40,80,89,95]}

        print(d['Name'], "is", d['Age'], "years old and lives in", d['City'], end = "\n\n")

        print(d)
```

```
Jia is 25 years old and lives in Mumbai

{'Name': 'Jia', 'City': 'Mumbai', 'marks': [70, 40, 80, 89, 95], 'Age': 25}
```

1.0.2 Upadating values

```
In [5]: d = {'Name': 'Jia', 'Age': 25, 'City': 'Mumbai'}

        d['Age'] = 8;  # update existing entry
        print(d, end = "\n\n")

        d['School'] = "DPS School"  # Add new entry
        print(d)
```

```
{'City': 'Mumbai', 'Age': 8, 'Name': 'Jia'}

{'City': 'Mumbai', 'Age': 8, 'School': 'DPS School', 'Name': 'Jia'}
```

1.0.3 Deleting values

```
In [22]: d = {'Name': 'Jia', 'Age': 25, 'City': 'Mumbai'}
         print("Original dictionary : ", d, end = "\n\n")

         del d['Name']  # remove entry with key 'Name'
         print("Printing dictionary after deleting 'name'", d, end = "\n\n")
```

```
d.clear()  # remove all entries in dict
print("Printing dictionary after clear()", d, end = "\n\n")

d = {'Name': 'Jia', 'Age': 25, 'City': 'Mumbai'}
del d  # delete entire dictionary
print("Printing dictionary after del command :",d)
```

```
Original dictionary :  {'Name': 'Jia', 'City': 'Mumbai', 'Age': 25}

Printing dictionary after deleting 'name' {'City': 'Mumbai', 'Age': 25}

Printing dictionary after clear() {}
```

```
---------------------------------------------------------------------------

NameError                                 Traceback (most recent call last)

<ipython-input-22-ec0a5a2d015e> in <module>()
 10 d = {'Name': 'Jia', 'Age': 25, 'City': 'Mumbai'}
 11 del d  # delete entire dictionary
---> 12 print("Printing dictionary after del command :",d)


NameError: name 'd' is not defined
```

1.0.4 Built-in Dictionary functions

```
In [1]: d = {'Name': 'Jia', 'Age': 25, 'City': 'Mumbai', 'School': 'DPS School', 'marks': [70,4

# Returns a list of dict's (key, value) tuple pairs
print(list(d.items()),"--> Key - value pairs in the dictionairy", end = "\n\n")

# Returns list of dictionary dict's keys
print(list(d.keys()),"--> list of keys in dictionary", end = "\n\n")

# Returns list of dictionary dict's values
print(list(d.values()),"--> list of all values in the dictionary")
```

```
[('City', 'Mumbai'), ('School', 'DPS School'), ('marks', [70, 40, 80, 89, 95]), ('Name', 'Jia'

['City', 'School', 'marks', 'Name', '10', 'Age', 10] --> list of keys in dictionary

['Mumbai', 'DPS School', [70, 40, 80, 89, 95], 'Jia', 9, 25, 'abc'] --> list of all values in t
```

1.0.5 Iterating over dictionary elements:

```
In [2]: for i,j in d.items():
            print(i,j)
```

```
City Mumbai
School DPS School
marks [70, 40, 80, 89, 95]
Name Jia
10 9
Age 25
10 abc
```

```
In [10]: d = {'Name': 'Jia', 'Age': 25, 'City': 'Mumbai', 'School': 'DPS School'}

         # For key key, returns value or default if key not in dictionary
         print(d.get('Name1', 'Invalid Key'), end = "\n\n")

         # sets dict[key]=default if key is not already in dict
         print( d.setdefault('Name1','abc'), end = "\n\n")

         print("Printing d : ",d)
```

```
Invalid Key

abc

Printing d :  {'Age': 25, 'City': 'Mumbai', 'Name': 'Jia', 'Name1': 'abc', 'School': 'DPS Scho
```

```
In [10]: d = {'Name': 'Jia', 'Age': 25, 'City': 'Mumbai', 'School': 'DPS School'}

         d2 = {'Name': 'Zara', 'Age': 7, 'Class': 'First'}
         print("Original d : ", d, end = "\n\n")

         d.update(d2)  # Adds dictionary d2's key-values pairs to d
         print("Updated d : ", d, end = "\n\n")
```

```
Original d :  {'Age': 25, 'City': 'Mumbai', 'School': 'DPS School', 'Name': 'Jia'}

Updated d :  {'Name': 'Zara', 'Age': 7, 'City': 'Mumbai', 'Class': 'First', 'School': 'DPS Sch
```

1.0.6 Dictionary using tuple pairs

```
In [24]:  dict([('sape', 4139), ('guido', 4127), ('jack', 4098)])
```

```
Out[24]: {'guido': 4127, 'jack': 4098, 'sape': 4139}
```

1.0.7 Sorted Dictionary

```
In [1]: d = {'Name': 'Jia', 'Age': 25, 'City': 'Mumbai', 'School': 'DPS School'}

        print(sorted(d))
```

```
['Age', 'City', 'Name', 'School']
```

1.0.8 Dictionary Comprehension

```
In [11]: {x: x**2 for x in (2, 4, 6, 5, 2)}
```

```
Out[11]: {2: 4, 4: 16, 5: 25, 6: 36}
```