Dictionaries in Python

What are Dictionaries?

A dictionary consists of keys and values. It is helpful to compare a dictionary to a list. Instead of the numerical indexes such as a list, dictionaries have keys. These keys are the keys that are used to access values within a dictionary.

![No description has been provided for this image]No description has been provided for this image

```
In [1]:  Lst = [2, 5, 7, 2, 8]
```

```
In [2]:  Lst[0]
```

```
Out[2]:  2
```

An example of a Dictionary `Dict` :

```
In [3]:  D1 = {1001:"abc", 1002:"def", 1003:"ghi", 1004:"jkl"}
         D1
```

```
Out[3]:  {1001: 'abc', 1002: 'def', 1003: 'ghi', 1004: 'jkl'}
```

```
In [4]:  D1[1004]
```

```
Out[4]:  'jkl'
```

```
In [5]:  d = {"id":30, 1:"abc", 2:"def", 3: 44}
```

```
In [6]:  d
```

```
Out[6]:  {'id': 30, 1: 'abc', 2: 'def', 3: 44}
```

```
In [7]:  d[2]
```

```
Out[7]:  'def'
```

```
In [8]:  d["id"]
```

```
Out[8]:  30
```

```
In [9]:  len(d)
```

```
Out[9]:  4
```

```
In [10]:  D = {'Empno':123, 'Name':'Smith', 'Age':23}
          print(D)
```
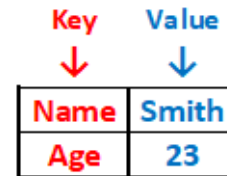
```
{'Empno': 123, 'Name': 'Smith', 'Age': 23}
```

```
In [11]:  D['Name']
```

```
Out[11]:  'Smith'
```

In summary, like a list, a dictionary holds a sequence of elements. Each element is represented by a key and its corresponding value. Dictionaries are created with two curly braces containing keys and values separated by a colon. For every key, there can only be one single value, however, multiple keys can hold the same value. Keys can only be strings, numbers, or tuples, but values can be any data type.

It is helpful to visualize the dictionary as a table, as in the following image. The first column

represents the keys, the second column represents the values.

Keys

You can retrieve the values based on the names:

```
In [12]:  # Get value by keys
          print(D['Name'])
```

Smith

```
In [13]:  print(D.get('Name'))
```

Smith

```
In [14]:  # Get value by key
          print(D['Age'])
```

23

```
In [15]:  print(D.items())
```

dict_items([('Empno', 123), ('Name', 'Smith'), ('Age', 23)])

Now let you retrieve the keys of the dictionary using the method `Dict()` :

```
In [16]:  # Get all the keys in dictionary
          print(D.keys())
```

dict_keys(['Empno', 'Name', 'Age'])

You can retrieve the values using the method `values()` :

```
In [17]:  # Get all the values in dictionary
          print(D.values())
```

dict_values([123, 'Smith', 23])

Changing and Adding elements

```
In [18]:  D
```

```
Out[18]:  {'Empno': 123, 'Name': 'Smith', 'Age': 23}
```

We can add an entry:

```
In [19]:   # Append value with key into dictionary
           D['ContactNo'] = 12345
           print(D)
```

{'Empno': 123, 'Name': 'Smith', 'Age': 23, 'ContactNo': 12345}

```
In [20]:   D['Age'] = 25

           print(D)
```

{'Empno': 123, 'Name': 'Smith', 'Age': 25, 'ContactNo': 12345}

Removing elements

We can delete an entry:

```
In [21]:   # Delete entries by key
           del(D['ContactNo'])
           print(D)
```

{'Empno': 123, 'Name': 'Smith', 'Age': 25}

Verify

We can verify if an element is in the dictionary:

```
In [22]:   # Verify the key is in the dictionary
           'Name' in D
```

Out[22]:   True

```
In [23]:   'ContactNo' in D
```

Out[23]:   False

pop

```
In [24]:   D.popitem()

           print(D)
```

{'Empno': 123, 'Name': 'Smith'}

```
In [25]:   D1 = {'Age': 28, 'ContactNo': 12345}
           print(D1)
```

{'Age': 28, 'ContactNo': 12345}

```
In [26]:   D1.pop('ContactNo')
           print(D1)
```

{'Age': 28}

update

```
In [27]:   D.update(D1)

           print(D)
```

```
{'Empno': 123, 'Name': 'Smith', 'Age': 28}
```

Dictionary using List

In [28]:
```python
D = {'Name' : ['Smith', 'Ford', 'Blake'], 'Age' : [23, 41, 34]}

print(D)
```

```
{'Name': ['Smith', 'Ford', 'Blake'], 'Age': [23, 41, 34]}
```

In [29]:
```python
print(D['Name'])
```

```
['Smith', 'Ford', 'Blake']
```

In [30]:
```python
print(D['Name'][1])
```

```
Ford
```

In [31]:
```python
print(D['Name'][-1])
```

```
Blake
```

In [32]:
```python
print(D['Name'][1], D['Age'][1])
```

```
Ford 41
```

In [33]:
```python
i = 2
print(D['Name'][i], D['Age'][i])
```

```
Blake 34
```

In [34]:
```python
print(sum(D['Age']))
```

```
98
```

In [ ]: