Basic data structure in Python

1. Tuple

2. List

3. Dictionaries

4. Sets

1. Tuple

Some basics rules for Tuple

1. Enclosed in round () brackets/parenthesis
2. Elements stored in order
3. Once written, cannot be mutated/changed/replaced
4. Different elements can be stored

In [1]:
```
#How to write a Tuple and print it
waqar01=("waqar", 12, True, "Alam", 200)
waqar01
```

Out[1]:
```
('waqar', 12, True, 'Alam', 200)
```

In [2]:
```
#To find the type of any variable
type(waqar01)
#print(type(waqar01)), Can also be written
```

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

In [3]:
```
#To find the total elements in tuple
waqar01=("waqar", 12, True, "Alam", 200)
len(waqar01)
```

Out[3]:
```
5
```

In [4]:
```
#To count the appearance of specific element in tuple
waqar01.count("waqar")
```

Out[4]:
```
1
```

In [5]:
```
#To find the index number of specific element in tuple
waqar01.index("Alam")
```

```
3
```

Out[5]:

In [6]:
```
#To find the element at specific index in tuple
waqar01[2]
```

Out[6]:
```
True
```

In [7]:
```
#How to get a tuple twice.
waqar01*2
```

Out[7]:
```
('waqar', 12, True, 'Alam', 200, 'waqar', 12, True, 'Alam', 200)
```

In [8]:
```
#How to get a tuple trice
waqar01*3
```

Out[8]:
```
('waqar',
 12,
 True,
 'Alam',
 200,
 'waqar',
 12,
 True,
 'Alam',
 200,
 'waqar',
 12,
 True,
 'Alam',
 200)
```

In [9]:
```
#Second Tuple
waqar02=("waqar", 123, 1224, True, False, "Hello")
waqar02
```

Out[9]:
```
('waqar', 123, 1224, True, False, 'Hello')
```

In [10]:
```
#How to add two or three tuples. Note: The tuple cannot be multiplied
waqar01+waqar02
```

Out[10]:
```
('waqar', 12, True, 'Alam', 200, 'waqar', 123, 1224, True, False, 'Hello')
```

In [11]:
```
#Assign variable to the sum
waqar03=waqar01+waqar02
waqar03
```

Out[11]:
```
('waqar', 12, True, 'Alam', 200, 'waqar', 123, 1224, True, False, 'Hello')
```

In [12]:
```
waqar03[0:11]
```

Out[12]:
```
('waqar', 12, True, 'Alam', 200, 'waqar', 123, 1224, True, False, 'Hello')
```

In [13]:
```
waqar03[-10:-1]
```

Out[13]:
```
(12, True, 'Alam', 200, 'waqar', 123, 1224, True, False)
```

In [14]:
```
#Fourth tuple
waqar04=(12, 12, 34, 1, 34, 34, 90, 9, 7, 8)
waqar04
```

Out[14]:
```
(12, 12, 34, 1, 34, 34, 90, 9, 7, 8)
```

In [15]:
```
#To find minimum and maximum number in tuple
min(waqar04)
max(waqar04)
```

Out[15]:
```
90
```

In [16]:
```
#Fifth tuple
waqar05=(12,23,45,45,67)
waqar05
```

Out[16]:
```
(12, 23, 45, 45, 67)
```

In [17]:
```
#Substraction in tuple
results=tuple(map(lambda i, j: i - j, waqar04, waqar05))
results
```

Out[17]:
```
(0, -11, -11, -44, -33)
```

In [18]:
```
# Addition with appearance of one tuple twice
results*2+waqar05
```

Out[18]:
```
(0, -11, -11, -44, -33, 0, -11, -11, -44, -33, 12, 23, 45, 45, 67)
```

---

2. List

Some basics rules for List

1. Enclosed in square [] bracket/braces
2. Elements stored in order form
3. Can be mutated/changed/replaced
4. Different elements can be stored

In [19]:
```
#First List
list01=["waqar", 12, 34, True, False]
list01
```

Out[19]:
```
['waqar', 12, 34, True, False]
```

In [20]:
```
len(list01)
```

Out[20]:
```
5
```

In [21]:
```
list01.count(12)
```

Out[21]:
```
1
```

In [22]:
```
################################Second List
list02=[12,12,34,2,3,4,9,0,1]
list02
```

Out[22]:
```
[12, 12, 34, 2, 3, 4, 9, 0, 1]
```

In [23]:
```
#To add something into the list
list01=["waqar", 12, 34, True, False]
list01.append("waqar")
list01
```

Out[23]:
```
['waqar', 12, 34, True, False, 'waqar']
```

In [24]:
```
#To write the elements of list in order
list02=[12,12,34,2,3,4,9,0,1]
list02.sort()
list02
```

Out[24]:
```
[0, 1, 2, 3, 4, 9, 12, 12, 34]
```

In [25]:
```
#To find minimum and maximum element in list
list02=[12,12,34,2,3,4,9,0,1]
min(list02)
max(list02)
```

Out[25]:
```
34
```

In [26]:
```
list01=["waqar", 12, 34, True, False]
list01[0:3]
```

Out[26]:
```
['waqar', 12, 34]
```

In [27]:
```
#To find the index of "true"
list01=["waqar", 12, 34, True, False]
list01.index(True)
```

Out[27]:
```
3
```

In [28]:
```
#To reverse the elemets of list
list01=["waqar", 12, 34, True, False]
list01.reverse()
list01
```

Out[28]:
```
[False, True, 34, 12, 'waqar']
```

In [29]:
```
#To find element at index 3
list01=["waqar", 12, 34, True, False]
list01[3]
```

Out[29]:
```
True
```

In [30]:
```
#To remove anything from list
list01=["waqar", 12, 34, True, False]
list01.remove(False)
list01
```

Out[30]:
```
['waqar', 12, 34, True]
```

In [31]:
```
#To add two lists
list01=["waqar", 12, 34, True, False]
list02=[12,12,34,2,3,4,9,0,1]
results=list01+list02
results
```

Out[31]:
```
['waqar', 12, 34, True, False, 12, 12, 34, 2, 3, 4, 9, 0, 1]
```

In [32]:
```
#To repeat list01 twise and add list02 with it
list01=["waqar", 12, 34, True, False]
list02=[12,12,34,2,3,4,9,0,1]
results=list01*2+list02
results
```

Out[32]:
```
['waqar',
 12,
 34,
 True,
 False,
 'waqar',
 12,
 34,
 True,
 False,
 12,
 12,
 34,
 2,
 3,
 4,
 9,
 0,
 1]
```

In [33]:
```
len(results)
```

Out[33]:
```
19
```

In [34]:
```
results.count("waqar")
```

Out[34]:
```
2
```

In [35]:
```
results.index("waqar")
```

Out[35]:
```
0
```

In [36]:
```
results[0]
```

Out[36]:
```
'waqar'
```

In [37]:
```
list02=[12,12,34,2,3,4,9,0,1]
```

---

3. Dictionaries

Some basics rules for Dictionaries

1. Enclosed in curly {} bracket/braces
2. Elements stored in unorder form
3. Can be mutated/changed/replaced
4. Each element can be composed of keys and value

In [38]:
```
#Dictionaries structure, keys and values
dict01={"pakora":100, "samosa":200, "raita":50, "salad":50}
type(dict01)
```

Out[38]:
```
dict
```

In [39]:
```
#How to extract the all keys
dict01.keys()
```

Out[39]:
```
dict_keys(['pakora', 'samosa', 'raita', 'salad'])
```

In [40]:
```
#How to extract all the values
dict01.values()
```

Out[40]:
```
dict_values([100, 200, 50, 50])
```

In [41]:
```
#How to add any elemt in dict
dict01["chicken roll"]=500
```

In [ ]:
```
dict01
```

Out[41]:
```
{'pakora': 100, 'samosa': 200, 'raita': 50, 'salad': 50, 'chicken roll': 500}
```

In [42]:
```
#Second Dictionary
dict02={"zaloby":100, "sawayyan":100}
type(dict02)
```

Out[42]:
```
dict
```

In [43]:
```
#How to update a dictinories
dict01.update(dict02)
dict01
```

Out[43]:
```
{'pakora': 100,
 'samosa': 200,
 'raita': 50,
 'salad': 50,
 'chicken roll': 500,
 'zaloby': 100,
 'sawayyan': 100}
```

In [44]:
```
#To clear the whole dictionaries
dict01.clear()
dict01
```

Out[44]:
```
{}
```

---

4. Sets

Some basics rules for Sets

1. Enclosed in curly {} bracket/braces
2. Unorder and unindexed form
3. Can be mutated/changed/replaced
4. Booleans are not allowed
5. Duplicates are not allowed

In [45]:
```
#First set, where booleans are not printed
set1={1,2,4,6,"waqar", True, "hello"}
set1
```

Out[45]:
```
{1, 2, 4, 6, 'hello', 'waqar'}
```

In [46]:
```
type(set1)
```

Out[46]:
```
set
```

In [47]:
```

```

```
#How to add something to set
set1.add("waqar alam")
set1
```

Out[47]: {1, 2, 4, 6, 'hello', 'waqar', 'waqar alam'}

In [48]:
```
set1={1,2,4,6,"waqar", True, "hello"}
set1.remove("waqar")
set1
```

Out[48]: {1, 2, 4, 6, 'hello'}

In [49]:
```
#Second set
set2={1,2,4,6,"waqar"}
set2
```

Out[49]: {1, 2, 4, 6, 'waqar'}

In [50]:
```
#Difference between two sets
set2.difference(set1)
```

Out[50]: {'waqar'}

In [51]:
```
set1={1,2,4,6,"waqar", True, "hello"}
set1.discard(6)
set1
```

Out[51]: {1, 2, 4, 'hello', 'waqar'}

In [52]:
```
set1={1,2,4,6,"waqar", True, "hello"}
set1.clear()
set1
```

Out[52]: set()