Basic Data Structure in Python

1- Tuple

2- List

3- Dictionary

4- Set

1-Tuple

- ordered collection of elements
- enclosed in () braces/parenthesis
- different kind of elements can be stored
- once elements are stored you can not change it (unmutable)

In [1]:
```
tup1 = (1, "ali", True, 1.5)
tup1
```

Out[1]: (1, 'ali', True, 1.5)

In [2]:
```
type(tup1)
```

Out[2]: tuple

- Indexing in Tuple

In [3]:
```
tup1[1]
```

Out[3]: 'ali'

In [4]:
```
tup1[0:]
```

Out[4]: (1, 'ali', True, 1.5)

In [5]:
```
tup1[0:3]
```

Out[5]: (1, 'ali', True)

In [6]:
```
len(tup1)
```

Out[6]: 4

In [7]:
```
tup2 = (2, "nasir", False, 2.5)
tup2
```

Out[7]: (2, 'nasir', False, 2.5)

In [8]:
```
# concatinate (add two tuple or more than 2 tuples)
tup1 + tup2
```

Out[8]: (1, 'ali', True, 1.5, 2, 'nasir', False, 2.5)

In [9]:
```
# concatinate + repeat
tup1*2 + tup2
```

Out[9]: (1, 'ali', True, 1.5, 1, 'ali', True, 1.5, 2, 'nasir', False, 2.5)

In [10]:
```
tup3 = (20, 30, 60, 80, 90)
tup3
```

Out[10]: (20, 30, 60, 80, 90)

In [11]:
```
#minumum value of tup
min(tup3)
```

Out[11]: 20

In [12]:
```
max(tup3)
```

Out[12]: 90

2- List

- ordered collections of elements
- enclose in [ ] square braces
- mutateable you can change it if need

In [13]:
```
list1 = [1, 'ali', True,]
list1
```

Out[13]: [1, 'ali', True]

In [14]:
```
type(list1)
```

Out[14]: list

In [15]:
```
len(list1)
```

Out[15]: 3

In [16]:
```
list1[2]
```

Out[16]: True

In [17]:
```
list2 = [3, 5, "Ali", "Nasir", 478, 53, 2, False]
list2
```

Out[17]: [3, 5, 'Ali', 'Nasir', 478, 53, 2, False]

In [18]:
```
list1 + list2
```

Out[18]: [1, 'ali', True, 3, 5, 'Ali', 'Nasir', 478, 53, 2, False]

In [19]:
```
list1 *2
```

Out[19]: [1, 'ali', True, 1, 'ali', True]

In [20]:
```
#append funtion
list1.append("nasir")
list1
```

Out[20]: [1, 'ali', True, 'nasir']

In [21]:
```
#clear funtion use for remove all elements from list
list1.clear()
list1
```

Out[21]: []

In [22]:
```
list1 = [1, "ali", True, "nasir"]
list1
```

Out[22]: [1, 'ali', True, 'nasir']

In [23]:
```
list1[0]=0
list1
```

Out[23]: [0, 'ali', True, 'nasir']

In [24]:
```
# list copy funtion is for a shallow copy example:
# phle wali list main agr changes hote bh hen to is list main koi farq nh prega
copy_of_list1 = list1.copy()
copy_of_list1
```

Out[24]: [0, 'ali', True, 'nasir']

In [25]:
```
a = [1, 2, ["test"]]
a
```

Out[25]: [1, 2, ['test']]

In [26]:
```
a.clear()
a
```

[]

Out[26]:

In [27]:
```
a = [1, 2, ["test"]]
a
```

Out[27]: [1, 2, ['test']]

In [28]:
```
a[2][0]="something else"
a
```

Out[28]: [1, 2, ['something else']]

In [29]:
```
import copy
```

In [30]:
```
a_copy=copy.deepcopy(a)
a_copy
```

Out[30]: [1, 2, ['something else']]

In [31]:
```
a[2][0]="ali"
a
```

Out[31]: [1, 2, ['ali']]

In [32]:
```
a_copy
```

Out[32]: [1, 2, ['something else']]

list.count funtion of uses

In [33]:
```
a.append(["ali"])
a
```

Out[33]: [1, 2, ['ali'], ['ali']]

In [34]:
```
a[3]=2
a
```

Out[34]: [1, 2, ['ali'], 2]

In [35]:
```
a.count(2)
```

Out[35]: 2

In [36]:
```
a.count(["ali"])
```

Out[36]: 1

In [38]:
```
a
```

Out[38]:
```
[1, 2, ['ali'], 2]
```

- Dictionaries

1- an unorderred collection of elements 2- Key and Value 3- Curly braces or bracket 4- Mutateable/changeble value

In [41]:
```
d1 = {"somasa": 15, "pakora": 100, "Raita": 20, "Salad": 50, "Chicken Rolls": 30}
d1
```

Out[41]:
```
{'somasa': 15, 'pakora': 100, 'Raita': 20, 'Salad': 50, 'Chicken Rolls': 30}
```

In [44]:
```
# extract key and values
key=d1.keys()
key
```

Out[44]:
```
dict_keys(['somasa', 'pakora', 'Raita', 'Salad', 'Chicken Rolls'])
```

In [46]:
```
values=d1.values()
values
```

Out[46]:
```
dict_values([15, 100, 20, 50, 30])
```

In [47]:
```
d1["tikki"]=10
d1
```

Out[47]:
```
{'somasa': 15,
 'pakora': 100,
 'Raita': 20,
 'Salad': 50,
 'Chicken Rolls': 30,
 'tikki': 10}
```

In [49]:
```
d1["tikki"]=15
d1
```

Out[49]:
```
{'somasa': 15,
 'pakora': 100,
 'Raita': 20,
 'Salad': 50,
 'Chicken Rolls': 30,
 'tikki': 15}
```

In [50]:
```
d2 = {"dates":200, "chocolates":100, "mithai":150}
d2
```

Out[50]:
```
{'dates': 200, 'chocolates': 100, 'mithai': 150}
```

In [51]:
```
# for concatinate dict
d1.update(d2)
d1
```

Out[51]:
```
{'somasa': 15,
 'pakora': 100,
 'Raita': 20,
 'Salad': 50,
 'Chicken Rolls': 30,
 'tikki': 15,
 'dates': 200,
 'chocolates': 100,
 'mithai': 150}
```

- Sets

1- unorderred and unindexed 2- used curly braces 3- Duplicates are not allowed 4- Booleans are not allowed

In [52]:
```
s1 = {1, 2.4, "ali", True}
s1
```

Out[52]:
```
{1, 2.4, 'ali'}
```

In [53]:
```
type(s1)
```

Out[53]:
```
set
```

In [56]:
```
s1.add("ali")
s1
```

Out[56]:
```
{1, 2.4, 'ali'}
```

In [57]:
```
s1.add("nasir")
s1
```

Out[57]:
```
{1, 2.4, 'ali', 'nasir'}
```

In [58]:
```
s1.add(2)
s1
```

Out[58]:
```
{1, 2, 2.4, 'ali', 'nasir'}
```

In [ ]:

In [ ]: