Tuple

- immutable data type
- collection of elemnets/objects
- ()

In [1]:
```python
# Create Empty tuple in Python
a = ()
```

In [3]:
```python
print(type(a))
```
```
<class 'tuple'>
```

In [4]:
```python
b = tuple()
print(type(b))
```
```
<class 'tuple'>
```

In [5]:
```python
c = 1,2,3,4,5
```

In [6]:
```python
print(type(c))
```
```
<class 'tuple'>
```

In [9]:
```python
d = "hi",123
print(type(d))
```
```
<class 'tuple'>
```

In [10]:
```python
# Access Values from tuple
a=(1,2,3,4.5,96)
```

In [11]:
```python
a[0]
```

Out[11]:
```
1
```

In [12]:

```
a[5-3]
```

Out[12]:

3

In [13]:

```
a[4/2]
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-13-41c027ab6610> in <module>
----> 1 a[4/2]

TypeError: tuple indices must be integers or slices, not float
```

In [14]:

```
a[4//2]
```

Out[14]:

3

In [15]:

```
a[int(4/2)]
```

Out[15]:

3

In [16]:

```
a[-1]
```

Out[16]:

96

In [17]:

```
a[-1-1]
```

Out[17]:

4.5

In [18]:

```
a[5-7]
```

Out[18]:

4.5

In [19]:

```
# Updation
a[0]="hello"
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-19-0c8fd26886c2> in <module>
      1 # Updation
----> 2 a[0]="hello"

TypeError: 'tuple' object does not support item assignment
```

In [21]:

```
# Concatination Operator '+'
a+a+a
```

Out[21]:

(1, 2, 3, 4.5, 96, 1, 2, 3, 4.5, 96, 1, 2, 3, 4.5, 96)

In [22]:

```
a
```

Out[22]:

(1, 2, 3, 4.5, 96)

In [23]:

```
id(a)
```

Out[23]:

2590749827296

In [24]:

```
temp=a+a+a
```

In [25]:

```
id(temp)
```

Out[25]:

2590750578944

In [26]:

```python
# Replication (*)
a
```

Out[26]:

```
(1, 2, 3, 4.5, 96)
```

In [27]:

```python
a*4
```

Out[27]:

```
(1, 2, 3, 4.5, 96, 1, 2, 3, 4.5, 96, 1, 2, 3, 4.5, 96, 1, 2, 3, 4.5, 96)
```

In [29]:

```python
a*int(1.2)
```

Out[29]:

```
(1, 2, 3, 4.5, 96)
```

In [30]:

```python
b=(1,2,3,"hello",('a','b','c',('abc','xyz')))
```

In [31]:

```python
b[4]
```

Out[31]:

```
('a', 'b', 'c', ('abc', 'xyz'))
```

In [32]:

```python
b[4][1]
```

Out[32]:

```
'b'
```

In [33]:

```python
b[4][3]
```

Out[33]:

```
('abc', 'xyz')
```

In [34]:

```python
b[4][3][0]
```

Out[34]:

```
'abc'
```

In [35]:

```python
b[-1]
```

Out[35]:

```
('a', 'b', 'c', ('abc', 'xyz'))
```

In [36]:

```python
b[-1][-1]
```

Out[36]:

```
('abc', 'xyz')
```

In [37]:

```python
b[-1][-1][-2]
```

Out[37]:

```
'abc'
```

In [38]:

```python
c=(121,123,)
```

In [39]:

```python
c
```

Out[39]:

```
(121, 123)
```

In [40]:

```python
# Using range() create tuple
temp = tuple(range(1,20))
```

In [41]:

```python
temp
```

Out[41]:

```
(1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19)
```

In [42]:

```python
temp1= tuple(range(50,100+1,2))
```

In [43]:

```
print(temp1)
```

(50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86,
88, 90, 92, 94, 96, 98, 100)

In [44]:

```
# sorted()
t=40,10,30,20
type(t)
```

Out[44]:

tuple

In [45]:

```
t
```

Out[45]:

(40, 10, 30, 20)

In [46]:

```
t1=sorted(t) # default sorting is Ascending Order
```

In [47]:

```
t1
```

Out[47]:

[10, 20, 30, 40]

In [48]:

```
t1=sorted(t,reverse= True)
```

In [49]:

```
t1
```

Out[49]:

[40, 30, 20, 10]

In [50]:

```
t1=sorted(t,reverse= False)
```

In [51]:

```
t1
```

Out[51]:

```
[10, 20, 30, 40]
```

In [52]:

```python
# Tuple Packing
name="narayana"
roll="13a85a0111"
mobile=9696969696
college="abc college"
info = name,roll,mobile,college
```

In [53]:

```
info
```

Out[53]:

```
('narayana', '13a85a0111', 9696969696, 'abc college')
```

In [54]:

```python
# Tuple Unpacking
temp =(10,20,3.5,80)
a,b,c,d =temp
a
```

Out[54]:

```
10
```

In [55]:

```
b
```

Out[55]:

```
20
```

In [56]:

```
c
```

Out[56]:

```
3.5
```

In [57]:

```
d
```

Out[57]:

```
80
```

In [58]:

```python
# Slicing Operator ':'
temp
```

Out[58]:

```
(10, 20, 3.5, 80)
```

In [59]:

```python
temp[1:]
```

Out[59]:

```
(20, 3.5, 80)
```

In [60]:

```python
print(temp[2:200])
```

```
(3.5, 80)
```

In [61]:

```python
temp[200]
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
<ipython-input-61-dc6735acd3c8> in <module>
----> 1 temp[200]

IndexError: tuple index out of range
```

In [62]:

```python
temp[::-1]
```

Out[62]:

```
(80, 3.5, 20, 10)
```

In [63]:

```python
# Update/Modification of Tuple
# 1) Convert Tuple to List
# 2) Perform operation on list
# 3) Convert list to Tuple
```

In [64]:

```python
temp
```

Out[64]:

```
(10, 20, 3.5, 80)
```

In [65]:

```python
temp=list(temp)
```

In [66]:

```python
temp
```

Out[66]:

```
[10, 20, 3.5, 80]
```

In [67]:

```python
temp[1]="hello check me"
```

In [68]:

```python
temp
```

Out[68]:

```
[10, 'hello check me', 3.5, 80]
```

In [69]:

```python
temp=tuple(temp)
```

In [70]:

```python
temp
```

Out[70]:

```
(10, 'hello check me', 3.5, 80)
```

In [71]:

```python
# Tuple Methods
# dir(variable)
# dir(value)
# dir(predefindfunction)
```

In [73]:

```python
print(dir(temp))
```

```
['__add__', '__class__', '__contains__', '__delattr__', '__dir__', '__doc_
_', '__eq__', '__format__', '__ge__', '__getattribute__', '__getitem__', '__
getnewargs__', '__gt__', '__hash__', '__init__', '__init_subclass__', '__ite
r__', '__le__', '__len__', '__lt__', '__mul__', '__ne__', '__new__', '__redu
ce__', '__reduce_ex__', '__repr__', '__rmul__', '__setattr__', '__sizeof__',
'__str__', '__subclasshook__', 'count', 'index']
```

In [76]:

```python
print(dir((1,2,3)))
```

```
['__add__', '__class__', '__contains__', '__delattr__', '__dir__', '__doc_
_', '__eq__', '__format__', '__ge__', '__getattribute__', '__getitem__', '__
getnewargs__', '__gt__', '__hash__', '__init__', '__init_subclass__', '__ite
r__', '__le__', '__len__', '__lt__', '__mul__', '__ne__', '__new__', '__redu
ce__', '__reduce_ex__', '__repr__', '__rmul__', '__setattr__', '__sizeof__',
'__str__', '__subclasshook__', 'count', 'index']
```

In [75]:

```python
print(dir(tuple))
```

```
['__add__', '__class__', '__contains__', '__delattr__', '__dir__', '__doc_
_', '__eq__', '__format__', '__ge__', '__getattribute__', '__getitem__', '__
getnewargs__', '__gt__', '__hash__', '__init__', '__init_subclass__', '__ite
r__', '__le__', '__len__', '__lt__', '__mul__', '__ne__', '__new__', '__redu
ce__', '__reduce_ex__', '__repr__', '__rmul__', '__setattr__', '__sizeof__',
'__str__', '__subclasshook__', 'count', 'index']
```

In [77]:

```python
# Tuple Methods
# count()
```

In [78]:

```python
t = (1,21,3,4,5,2,147,8,6,2,141)
```

In [79]:

```python
# Syntax of Method
# variblename.methodname()
# value.methodname()
```

In [80]:

```python
t.count(3)
```

Out[80]:

```
1
```

In [81]:

```python
t.count(99)
```

Out[81]:

```
0
```

In [82]:

```
t.index(21)
```

Out[82]:

1

In [83]:

```
t.index(100)
```

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-83-beab13040dd4> in <module>
----> 1 t.index(100)

ValueError: tuple.index(x): x not in tuple
```

In [84]:

```
# Syntax of Deletion
# del var1,var2,var3[1],var3[1:9],...
```

In [ ]:

```
del temp
```

In [85]:

```
temp
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-85-da77557ed0c8> in <module>
----> 1 temp

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

Dictionary

- collection of items
- Every Item is a pair of Kay & Value
- Key is a immutable Data type & act like a index
- Value is a Mutable Data type
- {}
- Every item seperated with ,
- don't Default index
- Key & values are seperated with ':'

In [86]:

```python
# Create Empty Dict
a= {}
```

In [87]:

```python
print(type(a))
```

```
<class 'dict'>
```

In [88]:

```python
b= dict()
print(type(b))
```

```
<class 'dict'>
```

In [89]:

```python
temp ={"name":"narayana","rollno":"18a50501","mobile":8596741232}
```

In [90]:

```python
temp
```

Out[90]:

```
{'name': 'narayana', 'rollno': '18a50501', 'mobile': 8596741232}
```

In [91]:

```python
temp["name"]
```

Out[91]:

```
'narayana'
```

In [92]:

```python
temp['mobile']
```

Out[92]:

```
8596741232
```

In [93]:

```python
# Dict Updation
temp['mobile']= 1234567890
```

In [94]:

```python
temp['mobile']
```

Out[94]:

```
1234567890
```

In [95]:

```python
# Deletion in Dict
```

In [98]:

```python
del temp
```

In [99]:

```python
temp
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-99-da77557ed0c8> in <module>
----> 1 temp

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

TASKS

- Words Frequency
- Character Frequency

Hello this is python programming {"Hello":1,"this":1} {"H":1,'l':2}