In [3]:
```
t=()
t
```

Out[3]:
```
()
```

In [5]:
```
print(type(t))
```

```
<class 'tuple'>
```

In [7]:
```
t1=(10,20,30,40,40)
t1
```

Out[7]:
```
(10, 20, 30, 40, 40)
```

In [9]:
```
len(t1)
```

Out[9]:
```
5
```

In [11]:
```
t1.count(10)
```

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

In [13]:
```
t1.count(40)
```

Out[13]:
```
2
```

In [15]:
```
t1.index(20)
```

Out[15]:
```
1
```

In [17]:
```
t1.index(10)
```

Out[17]:
```
0
```

In [19]:
```
l5=['a', 'b', 'c', 'd']
l5
```

Out[19]:
```
['a', 'b', 'c', 'd']
```

In [21]:
```
l5[1]
```

Out[21]:
```
'b'
```

In [23]:
```
l5[1]=10
```

In [25]:
```
l5
```

Out[25]:
```
['a', 10, 'c', 'd']
```

In [27]:
```
t2 = (100, 3.4, 'nit', True, 1+2j, [1,2,3], (5,6,7))
t2
```

Out[27]:
```
(100, 3.4, 'nit', True, (1+2j), [1, 2, 3], (5, 6, 7))
```

In [29]:
```
print(t)
print(t1)
print(t2)
```

```
()
(10, 20, 30, 40, 40)
(100, 3.4, 'nit', True, (1+2j), [1, 2, 3], (5, 6, 7))
```

In [31]:
```
t1
```

Out[31]: (10, 20, 30, 40, 40)

In [33]:
```
t1[0]
```

Out[33]: 10

In [35]:
```
t1[0] = 1000
t1
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[35], line 1
----> 1 t1[0] = 1000
      2 t1

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

In [37]:
```
icici = (45678, 'cizps7789', 332000, 98765)
icici
```

Out[37]: (45678, 'cizps7789', 332000, 98765)

In [39]:
```
icici[0] = 1234
icici
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[39], line 1
----> 1 icici[0] = 1234
      2 icici

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

In [41]:
```
t1
```

Out[41]: (10, 20, 30, 40, 40)

In [43]:
```
t4 = t1 * 3
t4
```

Out[43]: (10, 20, 30, 40, 40, 10, 20, 30, 40, 40, 10, 20, 30, 40, 40)

In [45]:
```
t4
```

Out[45]: (10, 20, 30, 40, 40, 10, 20, 30, 40, 40, 10, 20, 30, 40, 40)

In [47]:
```
t4[:]
```

Out[47]: (10, 20, 30, 40, 40, 10, 20, 30, 40, 40, 10, 20, 30, 40, 40)

In [49]:
```
t1
```

Out[49]: (10, 20, 30, 40, 40)

In [51]:
```
t1[:7]
```

Out[51]: (10, 20, 30, 40, 40)

In [53]:
```
t1[2:]
```

Out[53]: (30, 40, 40)

In [55]:
```
t1
```

Out[55]: (10, 20, 30, 40, 40)

In [57]:
```
t1[0]
```

Out[57]: 10

In [59]:
```
t1[0:10:2]
```

Out[59]: (10, 30, 40)

In [61]:
```
t1.add(30)
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
Cell In[61], line 1
----> 1 t1.add(30)

AttributeError: 'tuple' object has no attribute 'add'
```

In [63]:
```
t2
```

Out[63]: (100, 3.4, 'nit', True, (1+2j), [1, 2, 3], (5, 6, 7))

In [65]:
```
t2.index('nit')
```

Out[65]: 2

In [67]:
```
t4
```

Out[67]: (10, 20, 30, 40, 40, 10, 20, 30, 40, 40, 10, 20, 30, 40, 40)

In [71]:
```
t4[0:100:4]
```

Out[71]: (10, 40, 40, 30)

Tuple Creation

In [78]:
```
tup1=() # Empty Tuple
```

In [80]:
```
tup2=(10,30,60) # Tuple of Integer Numbers
```

In [82]:
```
tup3 = (10.77,30.66,60.89) # tuple of float numbers
```

In [84]:
```
tup4 = ('one','two' , "three") # tuple of strings
```

In [86]:
```
tup5 = ('Asif', 25 ,(50, 100),(150, 90)) # Nested tuples
```

In [88]:
```
tup6 = (100, 'Asif', 17.765) # Tuple of mixed data types
```

In [90]:
```
tup7 = ('Asif', 25 ,[50, 100],[150, 90] , {'John' , 'David'} , (99,22,33))
```

In [92]:
```
len(tup7) #Length of list
```

Out[92]: 6

Tuple Indexing

In [99]:
```
tup2[0] # Retreive first element of the tuple
```

Out[99]: 10

In [101…
```
tup4[0] # Retreive first element of the tuple
```

Out[101… 'one'

In [103…
```
tup4
```

Out[103… ('one', 'two', 'three')

In [111…
```
tup4[0][1]
```

Out[111… 'n'

In [113…
```
tup4[-1] # Last item of the tuple
```

Out[113… 'three'

In [115…
```
tup4[-1][-1]
```

Out[115… 'e'

In [117…
```
tup5[-1] # Last item of the tuple
```

Out[117… (150, 90)

Tuple Slicing

In [121…
```
mytuple = ('one' , 'two' , 'three' , 'four' , 'five' , 'six' , 'seven' , 'eight'
```

In [123…
```
mytuple
```

Out[123… ('one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight')

In [125…
```
mytuple[0:3] # Return all items from 0th to 3rd index location excluding the ite
```

Out[125… ('one', 'two', 'three')

In [127…
```
mytuple[2:5] # List all items from 2nd to 5th index location excluding the item
```

Out[127… ('three', 'four', 'five')

In [129…
```
mytuple[:3] # Return first three items
```

Out[129… ('one', 'two', 'three')

In [131…
```
mytuple[:2] # Return first two items
```

Out[131… ('one', 'two')

In [133…
```
mytuple[-3:] # Return last three items
```

Out[133… ('six', 'seven', 'eight')

In [135…
```
mytuple[-2:] # Return last two items
```

Out[135… ('seven', 'eight')

In [137…
```
mytuple[-1] # Return last item of the tuple
```

Out[137… 'eight'

In [139…
```
mytuple[:] # Return whole tuple
```

Out[139… ('one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight')

Remove & Change Items

In [142…
```
mytuple
```

Out[142… ('one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight')

In [144…
```
del mytuple[0] # Tuples are immutable which means we can't DELETE tuple items
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[144], line 1
----> 1 del mytuple[0]

TypeError: 'tuple' object doesn't support item deletion
```

In [146…
```
mytuple[0] = 1 # Tuples are immutable which means we can't CHANGE tuple items
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[146], line 1
----> 1 mytuple[0] = 1

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

In [148…
```
del mytuple # Deleting entire tuple object is possible
```

In [150…
```
mytuple
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[150], line 1
----> 1 mytuple

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

Loop through a tuple

In [153…
```
mytuple
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
Cell In[153], line 1
----> 1 mytuple

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

In [155…
```
mytuple = ('one' , 'two' , 'three' , 'four' , 'five' , 'six' , 'seven' , 'eight'
```

In [159…
```
for i in mytuple:
    print(i)
```

```
one
two
three
four
five
six
seven
eight
```

In [163…
```
for i in enumerate(mytuple):
    print(i)
```

```
(0, 'one')
(1, 'two')
(2, 'three')
(3, 'four')
(4, 'five')
(5, 'six')
(6, 'seven')
(7, 'eight')
```

Count

In [166…
```
mytuple1 =('one', 'two', 'three', 'four', 'one', 'one', 'two', 'three')
```

In [168…
```
mytuple1.count('one') # Number of times item "one" occurred in the tuple.
```

Out[168… 3

In [170…
```
mytuple1.count('two') # Occurence of item 'two' in the tuple
```

Out[170… 2

In [172…
```
mytuple1.count('four') #Occurence of item 'four' in the tuple
```

Out[172… 1

Tuple Membership

In [175…
```
mytuple
```

Out[175… ('one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight')

In [177…
```
'one' in mytuple # Check if 'one' exist in the list
```

Out[177… True

In [179…
```
'ten' in mytuple # Check if 'ten' exist in the list
```

Out[179… False

In [181…
```
if 'three' in mytuple: # Check if 'three' exist in the list
    print('Three is present in the tuple')
else:
    print('Three is not present in the tuple')
```

Three is present in the tuple

In [183…
```
if 'eleven' in mytuple: # Check if 'eleven' exist in the list
    print('eleven is present in the tuple')
else:
    print('eleven is not present in the tuple')
```

eleven is not present in the tuple

Index Position

In [186…
```
mytuple
```

Out[186… ('one', 'two', 'three', 'four', 'five', 'six', 'seven', 'eight')

In [188…
```
mytuple.index('one') # Index of first element equal to 'one'
```

Out[188… 0

In [190…
```
mytuple.index('five') # Index of first element equal to 'five'
```

Out[190… 4

In [192…
```
mytuple1
```

Out[192… ('one', 'two', 'three', 'four', 'one', 'one', 'two', 'three')

In [194…
```
mytuple1.index('one') # Index of first element equal to 'one'
```

Out[194… 0

Sorting

In [197…
```
mytuple2 = (43,67,99,12,6,90,67)
```

In [199…
```
sorted(mytuple2) # Returns a new sorted list and doesn't change original tuple
```

Out[199… [6, 12, 43, 67, 67, 90, 99]

In [201…
```
sorted(mytuple2, reverse=True) # Sort in descending order
```

Out[201… [99, 90, 67, 67, 43, 12, 6]