

Tuples

-> A tuple is similar to list

-> The difference between the two is that we can't change the elements of tuple once it is assigned whereas in the list, elements can be changed

Tuple creation

```
In [2]: #empty tuple
t = ()

#tuple having integers
t = (1, 2, 3)
print(t)

#tuple with mixed datatypes
t = (1, 'raju', 28, 'abc')
print(t)

#nested tuple
t = (1, (2, 3, 4), [1, 'raju', 28, 'abc'])
print(t)

(1, 2, 3)
(1, 'raju', 28, 'abc')
(1, (2, 3, 4), [1, 'raju', 28, 'abc'])
```

```
In [3]: #only parenthesis is not enough
t = ('satish')
type(t)
```

Out[3]: str

```
In [4]: #need a comma at the end
t = ('satish',)
type(t)
```

Out[4]: tuple

```
In [7]: #parenthesis is optional
t = "satish",
print(type(t))

print(t)

<class 'tuple'>
('satish',)
```

Accessing Elements in Tuple

```
In [8]: t = ('satish', 'murali', 'naveen', 'srinu', 'brahma')

print(t[1])

murali
```

```
In [9]: #negative index
print(t[-1]) #print last element in a tuple

brahma
```

```
In [10]: #nested tuple
t = ('ABC', ('satish', 'naveen', 'srinu'))

print(t[1])

('satish', 'naveen', 'srinu')
```

```
In [11]: print(t[1][2])

srinu
```

```
In [1]: #Slicing
t = (1, 2, 3, 4, 5, 6)

print(t[1:4])

#print elements from starting to 2nd last elements
print(t[:-2])

#print elements from starting to end
print(t[:])

(2, 3, 4)
(1, 2, 3, 4)
(1, 2, 3, 4, 5, 6)
```

Changing a Tuple

unlike lists, tuples are immutable

This means that elements of a tuple cannot be changed once it has been assigned. But, if the element is itself a mutable datatype like list, its nested items can be changed.

```
In [3]: #creating tuple
t = (1, 2, 3, 4, [5, 6, 7])

t[2] = 'x' #will get TypeError

-----
TypeError                                Traceback (most recent call last)
<ipython-input-3-9f4cbf6ee0de> in <module>()
      2 t = (1, 2, 3, 4, [5, 6, 7])
      3
----> 4 t[2] = 'x' #will get TypeError

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

```
In [4]: t[4][1] = 'satish'
print(t)

(1, 2, 3, 4, [5, 'satish', 7])
```

```
In [15]: #concatinating tuples

t = (1, 2, 3) + (4, 5, 6)
print(t)

(1, 2, 3, 4, 5, 6)
```

```
In [16]: #repeat the elements in a tuple for a given number of times using the * operator.
t = (('satish', ) * 4)
print(t)

('satish', 'satish', 'satish', 'satish')
```

Tuple Deletion

```
In [18]: #we cannot change the elements in a tuple.
# That also means we cannot delete or remove items from a tuple.

#delete entire tuple using del keyword
t = (1, 2, 3, 4, 5, 6)

#delete entire tuple
del t
```

Tuple Count

```
In [19]: t = (1, 2, 3, 1, 3, 3, 4, 1)

#get the frequency of particular element appears in a tuple
t.count(1)
```

Out[19]: 3

Tuple Index

```
In [22]: t = (1, 2, 3, 1, 3, 3, 4, 1)

         print(t.index(3)) #return index of the first element is equal to 3

         #print index of the 1

         2
```

Tuple Membership

```
In [23]: #test if an item exists in a tuple or not, using the keyword in.
         t = (1, 2, 3, 4, 5, 6)

         print(1 in t)

         True
```

```
In [24]: print(7 in t)

         False
```

Built in Functions

Tuple Length

```
In [25]: t = (1, 2, 3, 4, 5, 6)
         print(len(t))

         6
```

Tuple Sort

```
In [26]: t = (4, 5, 1, 2, 3)

         new_t = sorted(t)
         print(new_t) #Take elements in the tuple and return a new sorted list
                     #(does not sort the tuple itself).

         [1, 2, 3, 4, 5]
```

```
In [27]: #get the largest element in a tuple
         t = (2, 5, 1, 6, 9)

         print(max(t))

         9
```

```
In [28]: #get the smallest element in a tuple
         print(min(t))

         1
```

```
In [29]: #get sum of elements in the tuple  
print(sum(t))
```

23