Tuple Data Structure

1. Tuple is exactly same as List except that it is immutable. i.e once we creates Tuple object,we cannot perform any changes in that object.
Hence Tuple is Read Only version of List.
2. If our data is fixed and never changes then we should go for Tuple.
3. Insertion Order is preserved
4. Duplicates are allowed
5. Heterogeneous objects are allowed.
6. We can preserve insertion order and we can differentiate duplicate objects by using index. Hence index will play very important role in Tuple also.
Tuple support both +ve and -ve index. +ve index means forward direction(from left to right) and -ve index means backward direction(from right to left)
7. We can represent Tuple elements within Parenthesis and with comma seperator.
Parenethesis are optional but recommended to use.

Tuple creation:

1. t=()

creation of empty tuple

2. t=(10,)

t=10,
creation of single valued tuple ,parenthesis are optional,should ends with comma

3. t=10,20,30

t=(10,20,30)
creation of multi values tuples & parenthesis are optional

Accessing elements of tuple:

We can access either by index or by slice operator

Tuple vs immutability:

Once we creates tuple,we cannot change its content.
Hence tuple objects are immutable.

Mathematical operators for tuple:

We can apply + and * operators for tuple

Important functions of Tuple:

1. len()

To return number of elements present in the tuple

Eg:

```
t=(10,20,30,40)
print(len(t))  #4
```

2. count()

To return number of occurrences of given element in the tuple

Eg:

```
t=(10,20,10,10,20)
print(t.count(10)) #3
```

3. index()

returns index of first occurrence of the given element.
If the specified element is not available then we will get ValueError.

Eg:

```
t=(10,20,10,10,20)
print(t.index(10)) #0
print(t.index(30)) ValueError: tuple.index(x): x not in tuple
```

4. sorted()

To sort elements based on default natural sorting order

5. min() and max() functions:

These functions return min and max values according to default natural sorting order.

Tuple Packing and Unpacking:

We can create a tuple by packing a group of variables.

Tuple unpacking is the reverse process of tuple packing
We can unpack a tuple and assign its values to different variables

Note: At the time of tuple unpacking the number of variables and number of values should be same. ,otherwise we will get ValueError.