Tuple in Python

Tuple Creation

Tuple in Python

- In python, a tuple is a sequence of immutable elements or items.
- Tuple is similar to list since the items stored in the list can be changed whereas the tuple is immutable and the items stored in the tuple cannot be changed.
- A tuple can be written as the collection of comma-separated values enclosed with the small brackets **( )**.

Syntax: var = **(** value1, value2, value3,…. **)**

Example: "Setdemo.py"

```
t1 = ()
t2 = (123,"python", 3.7)
t3 = (1, 2, 3, 4, 5, 6)
t4 = ("C",)
print(t1)
print(t2)
print(t3)
print(t4)
```

Output:

python tupledemo.py

```
()
(123, 'python', 3.7)
(1, 2, 3, 4, 5, 6)
('C',)
```

Tuple Indexing

Tuple Indexing in Python

- Like list sequence, the indexing of the python tuple starts from 0, i.e. the first element of the tuple is stored at the 0th index, the second element of the tuple is stored at the 1st index, and so on.
- The elements of the tuple can be accessed by using the slice operator [].

Example:

mytuple=('banana','apple','mango','tomato','berry')

banana	apple	mango	tomato	berry
0	1	2	3	4

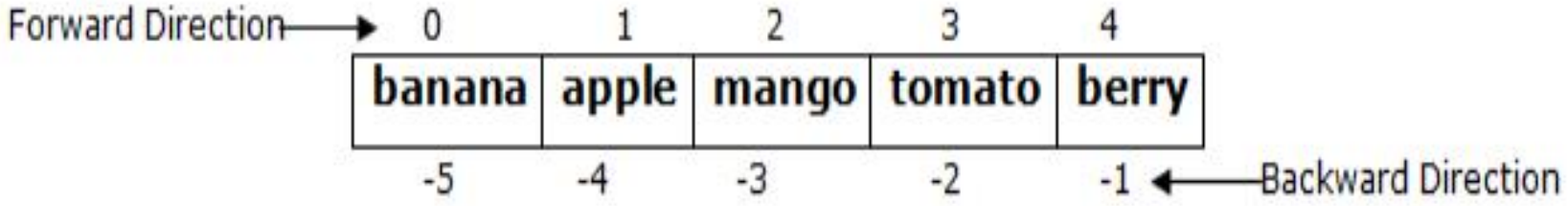
- mytuple[0]="banana"
- mytuple[2]="mango"

mytuple[1:3]=["apple","mango"]

Tuple Indexing in Python cont…

- Unlike other languages, python provides us the flexibility to use the negative indexing also. The negative indices are counted from the right.
- The last element (right most) of the tuple has the index -1, its adjacent left element is present at the index -2 and so on until the left most element is encountered.

Example: **mytuple=['banana','apple','mango','tomato','berry']**



- mytuple[-1]="berry"
- mytuple[-3]="mango"

mytuple[-4:-2]=["apple",mango"]

Tuple Operators

Tuple Operators in Python

+	It is known as concatenation operator used to concatenate two tuples.
*****	It is known as repetition operator. It concatenates the multiple copies of the same tuple.
[]	It is known as slice operator. It is used to access the item from tuple.
[:]	It is known as range slice operator. It is used to access the range of items from tuple.
in	It is known as membership operator. It returns if a particular item is present in the specified tuple.
not in	It is also a membership operator and It returns true if a particular item is not present in the tuple.

Tuple Operators in Python

cont…

Example: "tupleopdemo.py"

```
num=(1,2,3,4,5)
lang=('python','c','java','php')
print(num + lang) #concatenates two tuples
print(num * 2) #concatenates same tuple 2 times
print(lang[2]) # prints 2nd index value
print(lang[1:4]) #prints values from 1st to 3rd index.
print('cpp' in lang) # prints False
print(6 not in num) # prints True
```

Output:

```
python tupleopdemo.py
(1, 2, 3, 4, 5, 'python', 'c', 'java', 'php')
(1, 2, 3, 4, 5, 1, 2, 3, 4, 5)
java
('c', 'java', 'php')
False
True
```

How to add or remove elements from a tuple?

- Unlike lists, the tuple items cannot be updated or deleted as tuples are immutable.
- To delete an entire tuple, we can use the del keyword with the tuple name.

Example: "tupledemo1.py"

```
tup=('python','c','java','php')
tup[3]="html"
print(tup)
del tup[3]
print(tup)
del tup
```

Output:

```
python tupledemo1.py

'tuple' object does not support item assignment

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

Iterating a tuple

- A tuple can be iterated by using a **for - in** loop. A simple tuple containing four strings can be iterated as follows..

Example: "tupledemo2.py"

```
lang=('python','c','java','php')
print("The tuple items are \n")
for i in lang:
      print(i)
```

Output:

```
python tupledemo2.py
The tuple items are
python
c
java
php
```

Tuple Functions & Methods

Tuples Functions & Methods in Python

- Python provides various in-built functions and methods which can be used with tuples. Those are
  - len()
  - max()
  - min()
  - sum()
  - tuple()
  - sorted()
  - count()
  - index()

☞ **len():**

- In Python, **len()** function is used to find the length of tuple,i.e it returns the number of items in the tuple.

Syntax: `len(tuple)`

Example: **lendemo.py**

```
num=(1,2,3,4,5,6)
print("length of tuple :",len(num))
```

Output:

```
python lendemo.py
length of tuple : 6
```

Tuple Functions & Methods in Python

Cont..

☞ max ():

- In Python, max() function is used to find maximum value in the tuple.

Syntax: `max(tuple)`

Example: **maxdemo.py**

```
t1=(1,2,3,4,5,6)
t2=('java','c','python','cpp')
print("Max of Tuple t1 :",max(t1))
print("Max of Tuple t2 :",max(t2))
```

Output:

python maxdemo.py
Max of Tuple t1 : 6
Max of Tuple t2 : python

Tuple Functions & Methods in Python

Cont..

☞ min ():

- In Python, min() is used to find minimum value in the tuple.

Syntax: `min(tuple)`

Example: **mindemo.py**

```
t1=(1,2,3,4,5,6)
t2=('java','c','python','cpp')
print("Min of Tuple t1 :",min(t1))
print("Min of Tuple t2 :",min(t2))
```

Output:

python mindemo.py
Min of Tuple t1 : 1
Min of Tuple t2 : c

Tuple Functions & Methods in Python

Cont..

☞ sum ():

- In python, sum() function returns sum of all values in the tuple. The tuple values must in number type.

Syntax: `sum(tuple)`

Example: **sumdemo.py**

```
t1=(1,2,3,4,5,6)
print("Sum of tuple items :",sum(t1))
```

Output:

python sumdemo.py

Sum of tuple items : 21

Tuple Functions & Methods in Python

Cont..

☞ tuple ():

- In python, tuple() is used to convert given sequence (string or list) into tuple.

Syntax: `tuple(sequence)`

Example: **tupledemo.py**

```
str="python"
t1=tuple(str)
print(t1)
num=[1,2,3,4,5,6]
t2=tuple(num)
print(t2)
```

Output:

python tupledemo.py

('p', 'y', 't', 'h', 'o', 'n')

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

Tuple Functions & Methods in Python

Cont..

☞ sorted ():

- In python, sorted() function is used to sort all items of tuple in an ascending order.

Syntax: `sorted(tuple)`

Example: **sorteddemo.py**

```
num=(1,3,2,4,6,5)
lang=('java','c','python','cpp')
print(sorted(num))
print(sorted(lang))
```

Output:

python sorteddemo.py
(1, 2, 3, 4, 5, 6)
('c', 'cpp', 'java', 'python')

Tuple Functions & Methods in Python

Cont..

☞ count():

- In python, count() method returns the number of times an element appears in the tuple. If the element is not present in the tuple, it returns 0.

Syntax: `tuple.count(item)`

Example: **countdemo.py**

```
num=(1,2,3,4,3,2,2,1,4,5,8)
cnt=num.count(2)
print("Count of 2 is:",cnt)
cnt=num.count(10)
print("Count of 10 is:",cnt)
```

Output:

python countdemo.py

Count of 2 is: **3**

Count of 10 is: **0**

Tuple Functions & Methods in Python

Cont..

☞ index():

- In python, index () method returns index of the passed element. If the element is not present, it raises a ValueError.
- If tuple contains duplicate elements, it returns index of first occurred element.
- This method takes two more optional parameters start and end which are used to search index within a limit.

Syntax: `tuple.index(item [, start[, end]])`

Example: **indexdemo.py**

```
t1=('p','y','t','o','n','p')
print(t1.index('t'))
Print(t1.index('p'))
Print(t1.index('p',3,10))
Print(t1.index('z')) )
```

Output:

python indexdemo.py

2

0

5

Value Error