Module 04b. Data Structures (Tuples)

September 26, 2018

1 Tuples

A tuple is an immutable sequence Python objects.

Tuples are sequences, just like lists.

The main difference between the tuples and the lists is that the tuples cannot be changed unlike lists.

Tuples use parentheses, whereas lists use square brackets.

1.0.1 Creating a tuple

```
In [1]: tup1 = ('physics', 'chemistry', [1997, 89], 2000)
        tup2 = (1, 2, 3, 4, 5)
        tup3 = "a", "b", "c", "d"

        # The empty tuple is written as two parentheses containing nothing
        tup1 = ()
        tup1 = tuple()

        # A tuple containing a single value: include a comma, even though there is only one va
        tup1 = (50,)
```

1.0.2 Accessing Values in Tuples (Indexing and slicing)

```
In [6]: tup1 = ('physics', 'chemistry', 1997, 2000)
        tup2 = (1, 2, 3, 4, 5, 6, 7)

        print("tup1[0]: ", tup1[0])
        print("tup2[1:5]: ", tup2[1:5])
```

```
tup1[0]:  physics
tup2[1:5]:  (2, 3, 4, 5)
```

1.0.3 Updating Tuples

```
In [11]: tup = ('physics', 'chemistry', 1997, 2000)
         tup [0] = "Biology"
```

```
---------------------------------------------------------------------------

TypeError                                 Traceback (most recent call last)

<ipython-input-11-69e604f2bb0a> in <module>()
  1 tup = ('physics', 'chemistry', 1997, 2000)
----> 2 tup [0] = "Biology"


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

```
In [2]: tup = ('physics', 'chemistry', [1997, 89], 2000)
        # tup[2] = [1997, 1998] # error

        # In this case the list inside the tuple is getting updated
        tup[2][1] = 1998
        tup[2].append(1995)
        print(tup)
```

```
('physics', 'chemistry', [1997, 1998, 1995], 2000)
```

1.0.4 Delete Tuple Elements

```
In [9]: tup = ('physics', 'chemistry', 1997, 2000);

        print("Print Tuple : ", tup)
        del tup;
        print("After deleting tup : ", tup)
```

```
Print Tuple :  ('physics', 'chemistry', 1997, 2000)
```

```
---------------------------------------------------------------------------

NameError                                 Traceback (most recent call last)

<ipython-input-9-ca940e5e630c> in <module>()
  3 print("Print Tuple : ", tup)
  4 del tup;
----> 5 print("After deleting tup : ", tup)


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

1.0.5 Built-in Python functions

```
In [17]: tup = (10, 20, 30, 15)

         print(len(tup)," -- Gives the total length of the tuple.")

         # Applicable only to numeric datatype.
         print(max(tup)," -- Returns item from the tuple with max value.")
         print(min(tup)," -- Returns item from the tuple with min value.")
         print(sum(tup)," -- Returns the summation of all nunmerical elements in the tuple")
```

```
4  -- Gives the total length of the tuple.
30  -- Returns item from the tuple with max value.
10  -- Returns item from the tuple with min value.
75  -- Returns the summation of all nunmerical elements in the tuple
```

```
In [18]: tup = (10, 20, 30, 15)
         tup.count(10)
```

```
Out[18]: 1
```

```
In [20]: tup.index(30)
```

```
Out[20]: 2
```

Converting a list to a tuple

```
In [3]: l = [1,2,3,4,5,(3,'a','l')]
        tup = tuple(l)
```

Converting tuple to a list

```
In [5]: l = list(tup)
```