

Section 6 -Tuples, Sets and Dictionaries.

1. Tuples

```
In [6]: t = (1, 2, 3)
```

```
In [7]: type(t)
```

```
Out[7]: tuple
```

```
In [8]: t[0]
```

```
Out[8]: 1
```

```
In [9]: t[2]
```

```
Out[9]: 3
```

```
In [10]: t = t + t + t
```

```
In [11]: t
```

```
Out[11]: (1, 2, 3, 1, 2, 3, 1, 2, 3)
```

```
In [12]: t[0:4]
```

```
Out[12]: (1, 2, 3, 1)
```

```
In [13]: t[5:9]
```

```
Out[13]: (3, 1, 2, 3)
```

```
In [14]: t[7:]
```

```
Out[14]: (2, 3)
```

```
In [15]: t[:7]
```

```
Out[15]: (1, 2, 3, 1, 2, 3, 1)
```

```
In [30]: t1 = ( 1, 2, 3 )
         t2 = (4, 5, 6 )
         t3 = ( t1, t2 )
         t3
```

```
Out[30]: ((1, 2, 3), (4, 5, 6))
```

```
In [18]: t1 = ( 1, 2, 3 )
         L1 = [10, 20, 30 ]

         T = (1, 2, 3, 10.5, "John", t1, L1 )
```

```
In [19]: T
```

```
Out[19]: (1, 2, 3, 10.5, 'John', (1, 2, 3), [10, 20, 30])
```

```
In [20]: len(T)
```

```
Out[20]: 7
```

```
In [21]: T
```

```
Out[21]: (1, 2, 3, 10.5, 'John', (1, 2, 3), [10, 20, 30])
```

```
In [22]: T
```

```
Out[22]: (1, 2, 3, 10.5, 'John', (1, 2, 3), [10, 20, 30])
```

```
In [23]: T[0] = 10
```

```
-----
-----
TypeError                                Traceback (most recent c
all last)
<ipython-input-23-7c1881bd8350> in <module>()
----> 1 T[0] = 10

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

```
In [24]: T
```

```
Out[24]: (1, 2, 3, 10.5, 'John', (1, 2, 3), [10, 20, 30])
```

```
In [25]: T[6][1] = 200
```

```
In [26]: T
```

```
Out[26]: (1, 2, 3, 10.5, 'John', (1, 2, 3), [10, 200, 30])
```

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

```
Out[31]: (1, 2, 3)
```

```
In [32]: t2
```

```
Out[32]: (4, 5, 6)
```

```
In [33]: id(t1)
```

```
Out[33]: 4394360336
```

```
In [34]: t1 = t1 + t2
```

```
In [35]: t1
```

```
Out[35]: (1, 2, 3, 4, 5, 6)
```

```
In [36]: id(t1)
```

```
Out[36]: 4407230824
```

2. Sets

```
In [37]: s = { 1, 2, 3, 4 }
```

```
In [38]: type(s)
```

```
Out[38]: set
```

```
In [39]: len(s)
```

```
Out[39]: 4
```

```
In [40]: s[0]
```

```
-----  
-----  
TypeError                                Traceback (most recent c  
all last)  
<ipython-input-40-4e98c4f87897> in <module>()  
----> 1 s[0]  
  
TypeError: 'set' object does not support indexing
```

```
In [41]: s1 = set( "aaabbbcccddeeefff")  
s1
```

```
Out[41]: {'a', 'b', 'c', 'd', 'e', 'f'}
```

```
In [42]: t = [ 1, 2, 2, 3, 4, 5, 5 ]  
  
s2 = set( t )  
  
s2
```

```
Out[42]: {1, 2, 3, 4, 5}
```

```
In [43]: type(s2)
```

```
Out[43]: set
```

```
In [44]: s1
```

```
Out[44]: {'a', 'b', 'c', 'd', 'e', 'f'}
```

```
In [45]: 'a' in s1
```

```
Out[45]: True
```

```
In [46]: 'e' in s1
```

```
Out[46]: True
```

```
In [47]: 'k' in s1
```

```
Out[47]: False
```

```
In [48]: s2
```

```
Out[48]: {1, 2, 3, 4, 5}
```

```
In [49]: 5 in s2
```

```
Out[49]: True
```

```
In [50]: 10 in s2
```

```
Out[50]: False
```

```
In [51]: A = { 1, 2, 3, 4, 5 }  
B = { 8, 4, 5, 6, 7 }  
A, B
```

```
Out[51]: ({1, 2, 3, 4, 5}, {4, 5, 6, 7, 8})
```

```
In [52]: A - B
```

```
Out[52]: {1, 2, 3}
```

```
In [53]: A | B
```

```
Out[53]: {1, 2, 3, 4, 5, 6, 7, 8}
```

```
In [54]: A & B
```

```
Out[54]: {4, 5}
```

```
In [55]: A, B
```

```
Out[55]: ({1, 2, 3, 4, 5}, {4, 5, 6, 7, 8})
```

```
In [56]: A ^ B
```

```
Out[56]: {1, 2, 3, 6, 7, 8}
```

```
In [57]: x = { 10, 20, 30 }
```

```
In [58]: a, b, c = x
```

```
In [59]: a, b, c
```

```
Out[59]: (10, 20, 30)
```

```
In [60]: a
```

```
Out[60]: 10
```

```
In [61]: s = {}
```

```
In [62]: type(s)
```

```
Out[62]: dict
```

```
In [63]: s = set()
```

```
In [64]: type(s)
```

```
Out[64]: set
```

3. Dictionary Object Basics

```
In [65]: scores = { 'John': 98, 'Alex': 85, 'Tom': 88, 'Cathy':90 }
```

```
In [66]: type(scores)
```

```
Out[66]: dict
```

```
In [67]: len(scores)
```

```
Out[67]: 4
```

```
In [68]: scores
```

```
Out[68]: {'Alex': 85, 'Cathy': 90, 'John': 98, 'Tom': 88}
```

```
In [69]: scores['Kris'] = 95
scores
```

```
Out[69]: {'Alex': 85, 'Cathy': 90, 'John': 98, 'Kris': 95, 'Tom': 88}
```

```
In [70]: scores['Alex']
```

```
Out[70]: 85
```

```
In [71]: scores['Tim']
```

```
-----
-----
KeyError                                Traceback (most recent c
all last)
<ipython-input-71-3aacefa22f8b> in <module>()
----> 1 scores['Tim']

KeyError: 'Tim'
```

```
In [72]: del scores['Alex']
scores
```

```
Out[72]: {'Cathy': 90, 'John': 98, 'Kris': 95, 'Tom': 88}
```

```
In [73]: list(scores)
```

```
Out[73]: ['Tom', 'John', 'Cathy', 'Kris']
```

```
In [74]: scores.keys()
```

```
Out[74]: dict_keys(['Tom', 'John', 'Cathy', 'Kris'])
```

```
In [75]: sorted(list(scores))
```

```
Out[75]: ['Cathy', 'John', 'Kris', 'Tom']
```

```
In [76]: marks = dict([('Cathy', 90), ('Kris', 95), ('Tom', 88), ('Alex', 90)])  
marks
```

```
Out[76]: {'Alex': 90, 'Cathy': 90, 'Kris': 95, 'Tom': 88}
```

```
In [77]: grade = dict(A=90, B=80, C=70, D=60, F=50)  
grade
```

```
Out[77]: {'A': 90, 'B': 80, 'C': 70, 'D': 60, 'F': 50}
```

```
In [78]: list(grade)
```

```
Out[78]: ['B', 'F', 'C', 'A', 'D']
```

```
In [79]: sq = { x:x**2 for x in ( 1, 2, 3, 4, 5 )}  
sq
```

```
Out[79]: {1: 1, 2: 4, 3: 9, 4: 16, 5: 25}
```

```
In [82]: sq2 = { x:x**2 for x in range(10)}  
sq2
```

```
Out[82]: {0: 0, 1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81}
```

```
In [83]: 9 ** 2
```

```
Out[83]: 81
```

```
In [84]: sq2.keys()
```

```
Out[84]: dict_keys([0, 1, 2, 3, 4, 5, 6, 7, 8, 9])
```

```
In [85]: sq2.values()
```

```
Out[85]: dict_values([0, 1, 4, 9, 16, 25, 36, 49, 64, 81])
```

```
In [86]: sq2.items()
```

```
Out[86]: dict_items([(0, 0), (1, 1), (2, 4), (3, 9), (4, 16), (5, 25), (6, 36), (7, 49), (8, 64), (9, 81)])
```

4. Dictionary Object Methods

```
In [88]: scores
```

```
Out[88]: {'Cathy': 90, 'John': 98, 'Kris': 95, 'Tom': 88}
```

```
In [90]: grade
```

```
Out[90]: {'A': 90, 'B': 80, 'C': 70, 'D': 60, 'F': 50}
```

```
In [91]: sq2
```

```
Out[91]: {0: 0, 1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81}
```

```
In [92]: len(scores)
```

```
Out[92]: 4
```

```
In [93]: len(sq2)
```

```
Out[93]: 10
```

```
In [94]: scores
```

```
Out[94]: {'Cathy': 90, 'John': 98, 'Kris': 95, 'Tom': 88}
```

```
In [95]: scores['Cathy']
```

```
Out[95]: 90
```

```
In [96]: scores['Tom'] = 90  
scores
```

```
Out[96]: {'Cathy': 90, 'John': 98, 'Kris': 95, 'Tom': 90}
```

```
In [97]: scores['Alex'] = 92  
scores
```

```
Out[97]: {'Alex': 92, 'Cathy': 90, 'John': 98, 'Kris': 95, 'Tom': 90}
```

```
In [98]: del scores['John']  
scores
```

```
Out[98]: {'Alex': 92, 'Cathy': 90, 'Kris': 95, 'Tom': 90}
```

```
In [99]: 'Cathy' in scores
```

```
Out[99]: True
```

```
In [100]: "Gary" in scores
```

```
Out[100]: False
```

```
In [101]: "Gary" not in scores
```

```
Out[101]: True
```



```
In [102]: s = iter( scores )  
          type(s)
```

```
Out[102]: dict_keyiterator
```

```
In [103]: for k in s:  
          print(k)
```

```
Tom  
Alex  
Cathy  
Kris
```

```
In [104]: grade
```

```
Out[104]: {'A': 90, 'B': 80, 'C': 70, 'D': 60, 'F': 50}
```

```
In [105]: g = iter( grade )
```

```
In [106]: for k in g:  
          print(k)
```

```
B  
F  
C  
A  
D
```

```
In [107]: sq
```

```
Out[107]: {1: 1, 2: 4, 3: 9, 4: 16, 5: 25}
```

```
In [108]: sq.clear()
```

```
In [109]: sq
```

```
Out[109]: {}
```

```
In [110]: sq2
```

```
Out[110]: {0: 0, 1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64, 9: 81}
```

```
In [111]: sq2.pop( 8 )  
          sq2
```

```
Out[111]: {0: 0, 1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 9: 81}
```

```
In [112]: scores
```

```
Out[112]: {'Alex': 92, 'Cathy': 90, 'Kris': 95, 'Tom': 90}
```

```
In [114]: scores.pop( 'Kris')
          scores
```

```
Out[114]: {'Alex': 92, 'Cathy': 90, 'Tom': 90}
```

```
In [115]: grade
```

```
Out[115]: {'A': 90, 'B': 80, 'C': 70, 'D': 60, 'F': 50}
```

```
In [116]: grade.popitem()
          grade
```

```
Out[116]: {'A': 90, 'C': 70, 'D': 60, 'F': 50}
```

5. Dictionary View Objects

```
In [117]: scores
```

```
Out[117]: {'Alex': 92, 'Cathy': 90, 'Tom': 90}
```

```
In [118]: sv = scores.values()
          sv
```

```
Out[118]: dict_values([90, 92, 90])
```

```
In [119]: scores['Steve'] = 100
```

```
In [120]: sv
```

```
Out[120]: dict_values([90, 92, 90, 100])
```

```
In [121]: scores
```

```
Out[121]: {'Alex': 92, 'Cathy': 90, 'Steve': 100, 'Tom': 90}
```

```
In [122]: sum = 0
          for s in sv:
              sum = sum + s

          sum
```

```
Out[122]: 372
```

```
In [123]: 92 + 90 + 100 + 90
```

```
Out[123]: 372
```

```
In [124]: scores['Alex'] = 95
```

```
In [125]: sv
```

```
Out[125]: dict_values([90, 95, 90, 100])
```

```
In [126]: sum = 0
          for s in sv:
              sum = sum + s

          sum
```

```
Out[126]: 375
```

```
In [127]: si = scores.items()
```

```
In [128]: for k,v in si:
          print(k, v)
```

```
Tom 90
Alex 95
Cathy 90
Steve 100
```

```
In [129]: scores
```

```
Out[129]: {'Alex': 95, 'Cathy': 90, 'Steve': 100, 'Tom': 90}
```

```
In [130]: sk = scores.keys()
```

```
In [131]: sk
```

```
Out[131]: dict_keys(['Tom', 'Alex', 'Cathy', 'Steve'])
```

```
In [132]: for k in sk: print(k)
```

```
Tom
Alex
Cathy
Steve
```

```
In [ ]:
```