

Python Data Structure

```
In [1]: l=[]  
1
```

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

```
In [2]: type(1)
```

```
Out[2]: int
```

```
In [3]: len(l)
```

```
Out[3]: 0
```

```
In [4]: id(1)
```

```
Out[4]: 2289906165440
```

```
In [5]: l.append(10)
```

```
In [6]: l
```

```
Out[6]: [10]
```

```
In [7]: len(l)
```

```
Out[7]: 1
```

```
In [8]: l.append(20)  
l.append(30)  
l.append(40)  
l.append(50)
```

```
In [9]: l
```

```
Out[9]: [10, 20, 30, 40, 50]
```

```
In [10]: len(l)
```

```
Out[10]: 5
```

```
In [11]: l1=l.copy()  
l1
```

```
Out[11]: [10, 20, 30, 40, 50]
```

```
In [12]: l1.append(100)
```

```
In [13]: l1
```

Out[13]: [10, 20, 30, 40, 50, 100]

In [14]: l==l1

Out[14]: False

In [15]: l!=l1

Out[15]: True

In [16]: l1

Out[16]: [10, 20, 30, 40, 50, 100]

In [17]: l==l1

Out[17]: False

In [18]: l!=l1

Out[18]: True

In [19]: print(len(l))
print(len(l1))

5

6

In [20]: print(l)
print(l1)

[10, 20, 30, 40, 50]

[10, 20, 30, 40, 50, 100]

In [21]: id(l1)

Out[21]: 2289883945536

In [22]: l1.clear()

In [23]: l1

Out[23]: []

In [24]: []

Out[24]: []

In [25]: id(l1)

Out[25]: 2289883945536

In [26]: l

Out[26]: [10, 20, 30, 40, 50]

```
In [27]: l.append('nit')
l.append(2.3)
l.append(1+2j)
l.append(True)
l.append([1,2,3])
```

In [28]: l

Out[28]: [10, 20, 30, 40, 50, 'nit', 2.3, (1+2j), True, [1, 2, 3]]

```
In [29]: l.append(10)
l
```

Out[29]: [10, 20, 30, 40, 50, 'nit', 2.3, (1+2j), True, [1, 2, 3], 10]

```
In [30]: l1=[10,2.3,(1+2j),True,'hello',[1,2,3]]
l1
```

Out[30]: [10, 2.3, (1+2j), True, 'hello', [1, 2, 3]]

```
In [31]: l1.append(10)
```

In [32]: l1

Out[32]: [10, 2.3, (1+2j), True, 'hello', [1, 2, 3], 10]

```
In [33]: l1.count(2.3)
```

Out[33]: 1

In [34]: l1

Out[34]: [10, 2.3, (1+2j), True, 'hello', [1, 2, 3], 10]

```
In [35]: l1.remove(1+2j)
```

In [36]: l1

Out[36]: [10, 2.3, True, 'hello', [1, 2, 3], 10]

In [37]: l1

Out[37]: [10, 2.3, True, 'hello', [1, 2, 3], 10]

```
In [38]: l1.pop()
```

Out[38]: 10

In [39]: l1

```
Out[39]: [10, 2.3, True, 'hello', [1, 2, 3]]
```

```
In [40]: l1.pop()
```

```
Out[40]: [1, 2, 3]
```

```
In [41]: l1
```

```
Out[41]: [10, 2.3, True, 'hello']
```

```
In [42]: l1.remove(True)
```

```
In [43]: l1
```

```
Out[43]: [10, 2.3, 'hello']
```

```
In [44]: l1
```

```
Out[44]: [10, 2.3, 'hello']
```

```
In [45]: l
```

```
Out[45]: [10, 20, 30, 40, 50, 'nit', 2.3, (1+2j), True, [1, 2, 3], 10]
```

```
In [46]: l.append('nit')
l.append(2.3)
l.append(1+2j)
l.append(True)
l.append([1,2,3])
```

```
In [47]: l
```

```
Out[47]: [10,
          20,
          30,
          40,
          50,
          'nit',
          2.3,
          (1+2j),
          True,
          [1, 2, 3],
          10,
          'nit',
          2.3,
          (1+2j),
          True,
          [1, 2, 3]]
```

```
In [48]: l
```

```
Out[48]: [10,
          20,
          30,
          40,
          50,
          'nit',
          2.3,
          (1+2j),
          True,
          [1, 2, 3],
          10,
          'nit',
          2.3,
          (1+2j),
          True,
          [1, 2, 3]]
```

```
In [49]: l1=[]
l1
```

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

```
In [50]: l1=[10,2.3,1+2j,True,'hello',[1,2,3]]
l1
```

```
Out[50]: [10, 2.3, (1+2j), True, 'hello', [1, 2, 3]]
```

```
In [51]: l1.append(10)
```

```
In [52]: l1
```

```
Out[52]: [10, 2.3, (1+2j), True, 'hello', [1, 2, 3], 10]
```

```
In [53]: l1.count(2.3)
```

```
Out[53]: 1
```

```
In [54]: l1
```

```
Out[54]: [10, 2.3, (1+2j), True, 'hello', [1, 2, 3], 10]
```

```
In [55]: l1.remove(1+2j)
```

```
In [56]: l1
```

```
Out[56]: [10, 2.3, True, 'hello', [1, 2, 3], 10]
```

```
In [57]: l1
```

```
Out[57]: [10, 2.3, True, 'hello', [1, 2, 3], 10]
```

```
In [58]: l1.remove((1+2j))
```

```
-----  
ValueError                                Traceback (most recent call last)  
Cell In[58], line 1  
----> 1 l1.remove((1+2j))  
  
ValueError: list.remove(x): x not in list
```

```
In [59]: l1
```

```
Out[59]: [10, 2.3, True, 'hello', [1, 2, 3], 10]
```

```
In [60]: l1.pop()
```

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

```
In [61]: l1
```

```
Out[61]: [10, 2.3, True, 'hello', [1, 2, 3]]
```

```
In [62]: l
```

```
Out[62]: [10,  
          20,  
          30,  
          40,  
          50,  
          'nit',  
          2.3,  
          (1+2j),  
          True,  
          [1, 2, 3],  
          10,  
          'nit',  
          2.3,  
          (1+2j),  
          True,  
          [1, 2, 3]]
```

```
In [63]: l.pop(2)
```

```
Out[63]: 30
```

```
In [64]: l
```

```
Out[64]: [10,
          20,
          40,
          50,
          'nit',
          2.3,
          (1+2j),
          True,
          [1, 2, 3],
          10,
          'nit',
          2.3,
          (1+2j),
          True,
          [1, 2, 3]]
```

```
In [65]: l.index(2.3)
```

```
Out[65]: 5
```

```
In [66]: l.insert((4,5))
```

```
-----
TypeError                                Traceback (most recent call last)
Cell In[66], line 1
----> 1 l.insert((4,5))

TypeError: insert expected 2 arguments, got 1
```

```
In [67]: l
```

```
Out[67]: [10,
          20,
          40,
          50,
          'nit',
          2.3,
          (1+2j),
          True,
          [1, 2, 3],
          10,
          'nit',
          2.3,
          (1+2j),
          True,
          [1, 2, 3]]
```

```
In [68]: l=['nit',2.3,True,[1,2,3],10,4]
```

```
In [69]: l
```

```
Out[69]: ['nit', 2.3, True, [1, 2, 3], 10, 4]
```

```
In [70]: print(l1)
          print(l)
```

```
[10, 2.3, True, 'hello', [1, 2, 3]]  
['nit', 2.3, True, [1, 2, 3], 10, 4]
```

```
In [71]: l1.extend(l)
```

```
In [72]: l1
```

```
Out[72]: [10, 2.3, True, 'hello', [1, 2, 3], 'nit', 2.3, True, [1, 2, 3], 10, 4]
```

```
In [73]: l
```

```
Out[73]: ['nit', 2.3, True, [1, 2, 3], 10, 4]
```

```
In [74]: l.reverse()
```

```
In [75]: l
```

```
Out[75]: [4, 10, [1, 2, 3], True, 2.3, 'nit']
```

```
In [76]: l5=[300,3,34,9,100]  
l5
```

```
Out[76]: [300, 3, 34, 9, 100]
```

```
In [77]: l5.sort()
```

```
In [78]: l5
```

```
Out[78]: [3, 9, 34, 100, 300]
```

```
In [79]: l5.sort(reverse=True)
```

```
In [80]: l5
```

```
Out[80]: [300, 100, 34, 9, 3]
```

```
In [81]: l5.sort(reverse=True)  
l5
```

```
Out[81]: [300, 100, 34, 9, 3]
```

```
In [82]: l
```

```
Out[82]: [4, 10, [1, 2, 3], True, 2.3, 'nit']
```

```
In [83]: l5
```

```
Out[83]: [300, 100, 34, 9, 3]
```

```
In [84]: l5[0]=3000  
l5
```



```
Out[84]: [3000, 100, 34, 9, 3]
```

Tuple and Range

```
In [1]: t=()  
t
```

```
Out[1]: ()
```

```
In [2]: type(t)
```

```
Out[2]: tuple
```

```
In [4]: t=(10,20,30)  
t
```

```
Out[4]: (10, 20, 30)
```

```
In [5]: len(t)
```

```
Out[5]: 3
```

```
In [9]: t1=(10,2.3,'nit',1+2j,True,10,20)  
t1
```

```
Out[9]: (10, 2.3, 'nit', (1+2j), True, 10, 20)
```

```
In [10]: print(t)  
print(t1)
```

```
(10, 20, 30)
```

```
(10, 2.3, 'nit', (1+2j), True, 10, 20)
```

```
In [11]: t.count(10)
```

```
Out[11]: 1
```

```
In [15]: t1.count(2.3)
```

```
Out[15]: 1
```

```
In [14]: t1.count(2.3)
```

```
Out[14]: 1
```

```
In [16]: t1.index(2.3)
```

```
Out[16]: 1
```

```
In [17]: t[0]
```

Out[17]: 10

In [18]: t

Out[18]: (10, 20, 30)

In [22]: t2=t*3
t2

Out[22]: (10, 20, 30, 10, 20, 30, 10, 20, 30)

In [23]: t1

Out[23]: (10, 2.3, 'nit', (1+2j), True, 10, 20)

In [24]: t1[1:6]

Out[24]: (2.3, 'nit', (1+2j), True, 10)

In [25]: t2

Out[25]: (10, 20, 30, 10, 20, 30, 10, 20, 30)

In [27]: t2[1:6:3]

Out[27]: (20, 20)

In [28]: t2[1:6:5]

Out[28]: (20,)

In [29]: t1

Out[29]: (10, 2.3, 'nit', (1+2j), True, 10, 20)

In [30]: t1[:]

Out[30]: (10, 2.3, 'nit', (1+2j), True, 10, 20)

In [31]: t1[:]

Out[31]: (10, 2.3, 'nit', (1+2j), True, 10, 20)

In [32]: t1[::-1]

Out[32]: (20, 10, True, (1+2j), 'nit', 2.3, 10)

In [33]: t2

Out[33]: (10, 20, 30, 10, 20, 30, 10, 20, 30)

```
In [34]: t2[::-2]
```

```
Out[34]: (30, 10, 20, 30, 10)
```

```
In [35]: t2
```

```
Out[35]: (10, 20, 30, 10, 20, 30, 10, 20, 30)
```

```
In [36]: t2[::2]
```

```
Out[36]: (10, 30, 20, 10, 30)
```

```
In [38]: t2[::-3]
```

```
Out[38]: (30, 30, 30)
```

```
In [39]: t=(1,2,3,4,5,6,7,8)
```

```
In [40]: t[:]
```

```
Out[40]: (1, 2, 3, 4, 5, 6, 7, 8)
```

```
In [41]: t[1:9]
```

```
Out[41]: (2, 3, 4, 5, 6, 7, 8)
```

```
In [43]: t=(1,2,3,4,5,6,7,8)  
t
```

```
Out[43]: (1, 2, 3, 4, 5, 6, 7, 8)
```

```
In [44]: t[3:-1]
```

```
Out[44]: (4, 5, 6, 7)
```

```
In [45]: t=(1,2,3,4,5,6,7,8)  
t
```

```
Out[45]: (1, 2, 3, 4, 5, 6, 7, 8)
```

```
In [46]: t[1:9]
```

```
Out[46]: (2, 3, 4, 5, 6, 7, 8)
```

```
In [47]: t
```

```
Out[47]: (1, 2, 3, 4, 5, 6, 7, 8)
```

```
In [48]: t[1:]
```

```
Out[48]: (2, 3, 4, 5, 6, 7, 8)
```

```
In [49]: t[:9]
```

```
Out[49]: (1, 2, 3, 4, 5, 6, 7, 8)
```

```
In [50]: t[:5]
```

```
Out[50]: (1, 2, 3, 4, 5)
```

```
In [51]: t[1:7:3]
```

```
Out[51]: (2, 5)
```

```
In [52]: t[::-1]
```

```
Out[52]: (8, 7, 6, 5, 4, 3, 2, 1)
```

```
In [53]: t
```

```
Out[53]: (1, 2, 3, 4, 5, 6, 7, 8)
```

```
In [54]: t[::-3]
```

```
Out[54]: (8, 5, 2)
```

```
In [55]: for i in t:  
         print(i)
```

```
1  
2  
3  
4  
5  
6  
7  
8
```

```
In [56]: for i in enumerate(t1):  
         print(i)
```

```
(0, 10)  
(1, 2.3)  
(2, 'nit')  
(3, (1+2j))  
(4, True)  
(5, 10)  
(6, 20)
```

Tuple are completed

```
In [65]: range(5)
```

```
Out[65]: range(0, 5)
```

```
In [58]: range(5)
```

```
Out[58]: range(0, 5)
```

```
In [59]: list(range(5))
```

```
Out[59]: [0, 1, 2, 3, 4]
```

```
In [60]: range(10,20)
```

```
Out[60]: range(10, 20)
```

```
In [62]: list(range(10,50,5))
```

```
Out[62]: [10, 15, 20, 25, 30, 35, 40, 45]
```

```
In [63]: list(range(10,20,30,40))
```

TypeError

Traceback (most recent call last)

Cell In[63], line 1

----> 1 list(range(10,20,30,40))

TypeError: range expected at most 3 arguments, got 4

list,tuple,range are completed